SCIENTIFIC CONFERENCE OF DOCTORAL SCHOOLS

BOOK OF ABSTRACTS

SCDS-UDJG 2024 The 12th Edition, GALAJI, 6th-7th of June 2024

> Universitatea "Dunărea de Jos" din Galați

2024

"DUNĂREA DE JOS" UNIVERSITY OF GALATI DOCTORAL SCHOOL OF FUNDAMENTAL AND ENGINEERING SCIENCES

BOOK of ABSTRACTS Scientific Conference of Doctoral Schools

SCDS-UDJG 2024

The 12th Edition

GALAŢI, 6th-7th of June 2024

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CONFERENCE PROGRAMME

THURSDAY – 6 of June 2024

	Invited plenary lectures (All sections - recording)
Parikshit N. Mahalle	Explainable ai for engineering applications
Daggubati Sirisha	Advancing diabetic retinopathy detection: an ensemble deep learning approach for enhanced classification accuracy
Viorica Mușat	Bottom-up nanostructuration in hybrid materials for emerging applications
Stefania Silvi	Probiotics, postbiotic and prebiotics as functional ingredients for health
Deniz Zungun	Producing for a better current account balance
Anna Barbaro	The relevance of quality certification in forensic science
Valentyn Chebanov	Switchable multicomponent heterocyclizations involving aminoazoles and salicylaldehydes
Marius-Anton (Toni)	Inflammatory skin diseases: correlations between clinical features and
Ionescu	microbiome changes
Hakan Kar	Social media facilitated sexual assault
Ersi Kalfoglou	The odyssey of forensic genetics

10:00 - 19:00 Invited lectures/Oral presentations in concurrent sections

FRIDAY – 7 of June 2024

9:00 - 13:00 Oral presentations/Poster session in concurrent sections

11:00 - 13:00 Workshop

13:00 - 14:00 Awarding Ceremony. Closing ceremony

14:00 - 15:00 Lunch

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PLENARY LECTURES (all sections)

PERSPECTIVES AND CHALLENGES IN DOCTORAL SCHOOLS

PL.1.

Explainable AI for engineering applications

Parikshit N. Mahalle

Department of Artificial Intelligence and Data Science Vishwakarma Institute of Information Technology, Pune, India

Abstract

Abstract The deployment of artificial intelligence (AI), Machine Learning, and deep learningbased solutions at all places have improved for businesses from a variety of sectors, such as automotive, electronics, and medical device manufacture, when compared to conventional, rulesbased implementations. Today's AI is model-centric where the data is stable and the majority of development efforts are spent on refining the model. In a data-centric AI approach, the data serves as the primary object that is iteratively developed and made deployable. This means more time is invested in labeling, managing, slicing, supplementing, and curating the data, while the model itself is kept relatively more static. The adoption of a data-centric strategy has resulted in some advancement that potentially makes AI benefits available to most businesses. The datacentric AI focuses on comprehending, utilizing, and reaching conclusions from data. AI used to be heavily dependent on rules and heuristics before becoming data-centric. These could be helpful in some circumstances, but when used on fresh datasets, they frequently produced lessthan-ideal outcomes or even errors. By adding machine learning and big data analytics tools, data-centric AI modifies this by enabling it to learn from data rather than depending on algorithms. It can therefore make wiser choices and deliver more precise outcomes. Additionally, it has the potential to be significantly more scalable than conventional AI methods. As datasets get bigger and more complicated, data-centric AI will probably become more and more significant in the future. This session mainly focuses on recent developments in the Explainability of Outcomes of AI models and justifies the outcomes with feature importance. The key objectives of this session include presenting a need for Explainable AI well equipped with coding and approaches, and methodologies to achieve accurate results by improving the feature selections. Explainability helps to handle challenges in improving the quality of data-centric models, challenges in datasets generation, synthetic datasets, analysis, and prediction algorithms in stochastic ways, etc. Keywords: Explainable AI, data-centric AI, scalability

PL.2. Advancing Diabetic Retinopathy Detection: An Ensemble Deep Learning Approach for Enhanced Classification Accuracy

Sirisha Daggubati

Department of Computer Science and Engineering, Maturi Venkata Subba Rao (MVSR) Engineering College, Hyderabad, India

Abstract

Diabetic retinopathy (DR) is a leading cause of preventable blindness in diabetic patients, necessitating timely screening and grading of retinal images to mitigate vision loss. This paper presents a three-stage ensemble of deep convolutional neural network (CNN) models for accurate DR detection and grading using fundus images. Each input image is divided into two patches and processed through four pre-trained CNN models (Xception, ResNet-50, InceptionV3, Xception). In the first stage, shallow and dense layer features from these models are integrated to capture significant DR information. In the second stage, an artificial neural network (ANN) classifier is trained using fused probability vectors from the two patches. The final stage combines the outputs of individual CNN models to produce the final decision, leveraging an ensemble technique. This multi-level deep learning approach, which merges detailed local patch features with the holistic context of the entire fundus image, achieves superior classification accuracy. The proposed method was evaluated against three classification schemes using a dataset of 1890 APTOS images, demonstrating the highest accuracy with 94.3% classification accuracy via tenfold cross-validation. This underscores its effectiveness in DR grading. The study highlights the significant roles of both local and global features in DR classification, setting the stage for further advancements in automated DR screening. Future work will explore more sophisticated neural network architectures and detailed classification of proliferative DR (PDR) images, aiming for a comprehensive and precise automatic DR grading system.

Keywords: Diabetic retinopathy, Ensemble, Shallow and dense layer features, Pre-trained CNN models

PL.3.

Bottom-up nanostructuration in hybrid materials for emerging applications

Viorica Mușat

"Dunărea de Jos" University of Galați, Romania

Abstract

Today everything from materials, technologies, devices and machines to thinking or AI is or is becoming hybrid. The key driving force behind these transformations, fueled and supported by new generation of sciences and technologies, is society's increasing demand for high functionality and performance with reduced energy consumption and costs, ensuring high accessibility. "Hybrid" means creating synergy by combining elements previously considered differernt to generate something entirely new. In materials science, nanotechnology has paved this path. Notably, the highly versatile solution-based bottom-up approaches have enabled the creation of true molecular hybrids. This starts from molecules and achieves the controlled assembly of nanometric (macro)molecular entities through chemical and intermolecular bonds. Entities smaller than 10 nm, known as building blocks, exhibit quantum effects. Thus, quantum synergy has emerged through the interactions at the nanoscale of the electronic structures and properties of different classes of chemical compounds (inorganic vs. organic). This has given rise to a "hybrid world" with theoretically unlimited development possibilities. The presentation consists of two parts. The first part provides a brief overview of the fundamental aspects of nanochemistry and nanostructured hybrid materials, highlighting their potential for new applications. The second part presents some research conducted by the Laboratory of NanoChemistry-Center of Nanostructures and Functional Materials from UDJG in collaboration with partners from CENIMAT-i3N Nova University of Lisbon, Fraunhofer Institute for Integrated Systems and Device Technology IISB of Erlangen, "I. G. Murgulescu" Institute and "P. Poni" Institute of the Romanian Academy. The focus is on the synthesis of 0D, 1D, and 2D nanostructured hybrids for applications in transparent and flexible electronics, photocatalysis, antimicrobial and biomimetic coatings. Keywords: Nanochemistry, building blocks, molecular hybrids, 0D/1D/2D nanostructured hybrids, transparent&flexible electronics, photocatalysis, antimicrobials, biomimetic coatings

PL.4.

Probiotics, postbiotics and prebiotics as functional ingredients for health

Stefania Silvi

Scuola di Bioscienze e Medicina Veterinaria, University of Camerino, Camerino, Italy

Abstract

Probiotics, postbiotics and prebiotics are considered as functional ingredients to be used in functional food design or as main components of dietary supplements. The consumers are interested in having health benefits from food. The European and the American consumers are aware on the effects of probiotics. The Americans are currently consuming them choosing probiotic functional foods respect beverages and supplements. The Europeans had traditional knowledge of "live bacteria or culture" and these consumers are also informed about the relations of probiotics with improvement of bacterial microbiota, support to the immune system and prevention of diseases. Less known appear prebiotics. The International Food Information Counsil reported that only the 36% of people know prebiotics were healthy compared to the 62% who said the same for probiotics. A huge 35% were unaware of their effect on health. The definition of prebiotic was updated in 2017 by the International Scientific Association for Probiotic and Prebiotic (ISAPP), giving to that compound a wider meaning considering that several substrates can be selectively used by microorganisms not only complex carbohydrates. In addition, the target of the beneficial effect is not only the gut, but whatever microbiota that can be beneficially modified. Driven by growing awareness and the increasing use of the term "postbiotics" in research and in commercial products, in 2021 the ISAPP formally defined a postbiotic as a preparation of inanimate microorganisms and/or their components that confers a health benefit on the host. The starting material, the means of inactivation and assurance of safety are fundamental to guarantee the safety of this formulation of several kinds of components. Knowing and understanding the functioning of the intestinal microbiota and being able to interfere on its dynamism - also using these functional ingredients - constitutes a great tool for contributing to improve human health.

Keywords: probiotics, prebiotics, postbiotics, gut health, consumer awareness

PL.5.

Producing for a better currentaccount balance

Deniz Züngün

Department of Human Resources Management, Manisa Bayar Celal University, Turkey

Abstract

This paper presents the research on one of the main variables related to the macro-economic structure of a nation, current account balance is a group of account, in which flow of funds, transacted via purchasing or selling services or financial assets between countries, is displayed.

Within the current account balance, current surplus occurs as a result of excess in unrequited transfers due to the fact that goods and service export is more than the import and due to increase in investment income. Another important macroeconomic indicator in economy, economic growth is defined as the increase in final goods and service quantity produced in a nation within a certain period. Economic growth is a prominent way for people in a nation to increase their quality of life. Thereby, main macroeconomic aim of all countries is to perform a balanced economic growth. While the microeconomic factors affected by or affecting economic growth differ, its relation with current account balance is one of the most investigated subjects lately. Although each nation had different effort in this, reaching to a determined aim has always remained in the agenda in every age and all around the world. Especially with the reform started in 1978, China developed quickly and became the center of world-wide economic agenda. Until approximately 40 years earlier, China had a closed economy system and exchange rate of national currency was determined by the government and the control of its centralized regime blocked international trade. Additionally, due to the fact that China did not have an outward-oriented economic structure besides not having a capital market to meet the Chinese financial need, it was impossible for China to become indebted to international market or institutions, allow foreign investment or invest in foreign countries.

Keywords: economic growth, current account balance, regression analysis

PL.6.

The relevance of quality certification in forensic science

Anna Barbaro

Dept. Forensic Genetics - Studio Indagini Mediche E Forensi (SIMEF)- Italy Universidad de Alcalá, Departamento de Química Analítica, Química Física e Ingeniería Química, Ctra. Madrid-Barcelona km 33,6, 28871 Alcalá de Henares, Madrid, Spain. Universidad de Alcalá, Instituto Universitario de Investigación en Ciencias Policiales, Libreros 27, 28801 Alcalá de Henares, Madrid, Spain.

Abstract

Quality assurance is highly necessary in forensic science to ensure that the quality of results obtained and to demonstrate they have been produced using valid, credible, and standardized protocols and to demonstrate the competency of the forensic experts. The implementation of quality systems is a legal requirement for forensic laboratories in countries across the EU and the USA, to ensure accurate, reliable, and precise results. In this talk, there will be discussed the application and relevance in forensics of some quality certification programs (UNI EN ISO 9001, 17020, 17024, 17025).

PL.7.

Switchable multicomponent heterocyclizations involving aminoazoles and salicylaldehydes

Valentyn Chebanov

Division of Functional Materials Chemistry SSI "Institute for Single Crystals" NAS of Ukraine – Ukraine, Kharkiv e-mail : <u>chebanov@isc.kh.ua</u>

Abstract

To control selectivity of multicomponent reaction the Condition-Based Divergent Strategy had been developed and applied for wide range of heterocyclizations, for instance, to switch directions of the treatments between carbonyl-containing CH-acids, aromatic aldehydes and aminoazoles. An introduction of additional reactive functional groups into the starting reagents allows to increase diversity of final structures, therefore, we applied the Strategy to tune selectivity of the MCRs involving aminoazoles and salicylaldehydes (see Scheme) using conventional and non-classical methods of activation (microwave irradiation and ultrasonication) as well as different catalytic systems.



PL.8.

Inflammatory skin diseases: correlations between clinical features and microbiome changes

Marius-Anton Ionescu

Department Inflammatory Diseases University Hospital Saint-Louis Paris, France, <u>dr.toni.ionescu@gmail.com</u>

Abstract

The skin microbiome is a complex ecosystem of skin's protective microbial communities whose imbalance can induce changes within the "interactomes" host-microbes (1-4). Microbiome's changes are linked to complex mechanisms leading to triggering or to aggravation of chronic inflammatory skin diseases as atopic dermatitis, psoriasis, acne, and others (5-7). The learning objectives of this lecture is to make an update on skin's microbiome changes in common inflammatory diseases of the skin as acne and atopic dermatitis and present recent results on normalizing skin microbiome in these diseases with the good clinical outcome significantly correlated to microbiome's improvement.

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PL.9.

Social media facilitated sexual assault

Hakan Kar

MD Mersin University Medical Faculty, Department of Forensic Medicine

Abstract

The sending of the first e-mail in 1971 is accepted as the beginning of "social media" history. Even though the biggest aim of the internet is the fast sharing of economic data, social media users have used the biggest portion of the internet. The Internet has given birth to a quirky range of modern addictions and maladies such as ego surfing, blog streaking, Google-stalking, cyberchondria, photo-lurking wikipedialism etc. Sexual assault by people who were acquainted by means of social media is very frequent nowadays. This paper presents the cases that were admitted to Mersin University Medical Faculty at the Department of Forensic Medicine by the complaint of sexual assault by those who were acquainted by means of social media. Case characteristics including age, sex, year, type of the social media, time, place, physical and genital examination findings and psychiatric outcomes are presented. Common features of social media related sexual abuse cases are highlighted. 95.8% of the 71 cases were female, average age was 15.9. Mental Retardation was diagnosed at 14.1%. One of third cases were member of a broken family. All perpetrators were male and most of them were between 14-32 years of age. Instagram was the most used platform for online dating. Most common threatening method was threatening by naked images of victims. WhatsApp was the most common platform for online sexual violence. Most of the victims were sexually assaulted within 3 months later from online dating. Nearly all of them were penetrative sexual assault. PTSD and suicidal tendency were most common psychiatric diagnosed of the victims. Educational programs to students and families which focused on safe internet usage will reduce the risk of online sexual abuse. Keywords: Online, Sexual Assault, Social Media, Internet

PL.10.

The odyssey of forensic genetics

Ersi Kalfoglou

Head of the Forensic Sciences Department of the Medical Faculty of Istanbul Yeni Yüzyıl University President of the Balkan Academy of Forensic Sciences

Abstract

Forensic Genetics is a long journey that began by the description of blood groups in 1900. The identification of biological samples was achieved via the study of a number of polymorphic enzymes and proteins together with the human leukocyte antigens besides blood groups and subgroups until the 80's. Although the studies carried out with these genetic markings gave successful results, various restrictions were the subject of discussion. While there were problems encountered especially when working with dried body stains, there were sometimes difficulties in evaluation. DNA technology, which was developed for diagnostic and therapeutic purposes at the beginning of 90's, has also been applied in forensic sciences and became indispensable. But the extraordinary exclusion power of the DNA technique and the precision of its application do not bring with it the fact that it is error-free. Today, there are various points that need to be taken into consideration when using DNA, which is defined as a magic. In addition, it is necessary for the judiciary system to be aware of the strengths and weaknesses of DNA data when used in the court.

Keywords: Forensic genetics; blood group antigens; polymorphic enzymes; HLA; STR; DNA; individualization

I. INVITED LECTURES

SECTION 5

ADVANCED RESEARCH IN ELECTRICAL / ELECTRONIC ENGINEERING, SYSTEM ENGINEERING AND INFORMATION TECHNOLOGIES

IL.5.1.

Wireless Power Transfer of the Machines and Devices for Mine Integration

Marian Găiceanu^{*}, Răzvan Buhosu, Răzvan Șolea[,] Vasile Solcanu, Marius George Solomon

Dun rea de Jos University of Galati, Domneasc Street, 47, 800008, Galati, Romania * Corresponding author: Marian.Gaiceanu@ugal.ro

Abstract

Following the implementation of the HEET II project, the implementation of a wireless power transfer system (WPT) was achieved for increased safety and an efficient transmission of energy to vehicles specific to mines, thus resulting in an innovative management system for the distribution of electricity. Currently, mining machinery uses fossil fuels or is mechanically driven. The "Dun rea de Jos" University of Galati, through its researchers, contributed to the completion of a prototype of electrical energy conversion for the machines, traction and transport machines that serve mining operations, a prototype that was subjected of tests procedures in Poland mines. The implementation of wireless energy transfer system to the machines, traction and transport vehicles that serve the mining operations, reduce the risks of explosion underground and lead to the increase in the efficiency of the machines, traction machines, and mining transport. This paper will include a presentation of the obtained results. The research has been conducted under EU-funded project "Innovative High Efficiency Power System for Machines and Devices, Increasing the Level of Work Safety in Underground Mining Excavations (HEETII)"

Keywords: ATEX, Wireless power transfer, Wireless Sensor Networks, wired network, Access Point, Gateway

SECTION 6 FUTURE OF ECO-NANOTECHNOLOGIES, FUNCTIONAL MATERIALS AND COATINGS

IL.6.1.

Metal Azolate Coordination Frameworks

Aurel Tăbăcaru^{*}

^a Dunarea de Jos|| University of Galati, Faculty of Science and Environment, Department of Chemistry, Physics and Environment, Domneasca Street 111, Galati, Romania *Corresponding author: aurel.tabacaru@ugal.ro

Abstract

In the past two decades, the vast classes of coordination polymers (CPs) and metal–organic frameworks (MOFs) have received deep attention in both the academic and industrial realms, as they can possess different functional properties of economic, technological and/or environmental interest, such as luminescence, electric conductivity, magnetism, catalytic activity, gas storage or separation, drug delivery – to mention only a few. Within this vast landscape, this lecture proposes a survey on those transition metal containing CPs and MOFs from the family of metal azolate coordination frameworks built up with poly(pyrazolate)- and poly(tetrazolate)-based ligands, in which N-donor heterocyclic rings are organized on rigid or flexible cores. The overview has been restricted to the most recurrent transition metals, namely copper, zinc, cobalt, nickel, cadmium, silver and iron. For each material, mentioning of the synthetic method(s) yielding to its isolation is complemented by a description of its main structural aspects and, whenever investigated, of its functional properties.

Keywords: poly(azolate)-based ligands, coordination frameworks, crystal structure, functional properties

IL.6.2. Impact of Metal Oxide Nanoparticles used in Active Food Packaging on Human Health

Maricica Stoica^{a,*}, Geta Cârâc^b

^a Cross-Border Faculty, "Dunarea de Jos" University of Galati, 47 Domneasca Street, 800008 Galati, Romania ^b Faculty of Sciences and Environment, "Dunarea de Jos" University of Galati, 47 Domneasca Street, 800008 Galati, Romania

* Corresponding author: <u>Maricica.Stoica@ugal.ro</u>

Abstract

Nowadays the most spread disease is the cancer and that is why all the achievements in life sciences, sciences, and technology are oriented toward getting better solutions to remove tumors from inside thepatients' bodies. Teletherapy is, probably, the most used technique, at this moment (together of coursewith the immunity approaches), and it supposes the use of direct or indirect ionizing radiation to destroy the affected cells of the tumor. *Tele* means that the radiation flux is transmitted into the patientbody from distance unlike brachytherapy which is implying the introduction of the source of radiationinside the patient's body. All the internet sites that are presenting teletherapy approaches (of coursefor some institutions) contain, somewhere at the end, a phrase containing a warning regarding the risk.

Keywords: Active food packaging, Metal oxide nanoparticles, Human health.

II. ORAL PRESENTATIONS

SECTION 3 PROGRESS IN FOOD SCIENCE AND BIO-RESOURCES ENGINEERING

OP. 3.1.

Technological suitability of quinoa in food formulation as an alternative solution to food diversification and food security in Burkina Faso

Elie Wilfried Wendnongma BIEGO ^{a*}, Camelia VIZIREANU^b, Abdallah DAO^c, Hagrétou Sawadogo/Lingani^a

 ^a New Dawn University, Science and Technology department, Laboratory of Biological and Applied Sciences, Bobo-Dioulasso, Burkina Faso,
^b Faculty of Food Science and Engineering, "Dunarea de Jos" University of Galati, 111 Domnească Street, 800201 Galați, România,
^c Institute of Environment and Agricultural Research (INERA), Bobo-Dioulasso, Burkina Faso

Institute of Environment and Agricultural Research (INERA), Bobo-Dioulasso, Burkina Fa *Corresponding author: <u>biegoelie@yahoo.fr</u>

Abstract

Burkina Faso, a landlocked country in West Africa, is characterized by its strong demographic growth, and has approximately 20,505,155 inhabitants (SMART Survey, 2023). The country is affected by food and nutritional insecurity linked to inaccessibility to products and non-diversification of foods. However, quinoa (*Chenopidium quinoa willd*), is recognized worldwide as a pseudo-cereal with high nutritional potential. It is in this sense that the present work aimed to carry out formulation tests of foods such as the traditional drink "zoom- koom", porridge granules, biscuits and cakes from quinoa produced in Burkina Faso. Preliminary results have shown that quinoa can be successfully used to partially or completely replace millet, sorghum or wheat flour traditionally used in these products. The present study presents the results of the sensory analysis on some quinoa-based products that also highlighted consumer acceptability. This opens up interesting perspectives for promoting this emerging culture in Burkina Faso which has not yet been the subject of study.

Keywords: Burkina Faso, quinoa, valorization, food diversification, sensory analysis, consumer acceptance.

OP. 3.2.

Evaluation of bioactive compounds and antibacterial activity of *Myrtus communis* berries

Ilir Mërtiri*, Mihaela Turturică, Gabriela Râpeanu, Nicoleta Stănciuc

^a "Dunărea de Jos" University of Galati, Faculty of Food Science and Engineering, 111 Domnească Street, 800201, Galati, Romania **Corresponding author:* <u>ilir meriri@yahoo.com</u>

Abstract

This work aims to present the potential of the bioactive compounds, regarding the antioxidant and antibacterial activity, present in myrtle (*Myrtus communis*) berries.

The extract from the berries collected in Albania was obtained by solid-liquid ultrasound-assisted extraction utilizing ethanol 70 % (v/v) and acetic acid (9:1 v/v). Spectrophotometric colorimetric assays determined the total polyphenolic, flavonoid, anthocyanin content, and antioxidant activity. HPLC determined the phytochemical profile of the extract. The antibacterial activity was performed against Bacillus spp., Escherichia coli, and Staphylococcus aureus on Agar Well Diffusion Method, and Broth Microdilution Assay to determine the Minimal Bactericidal Concentration. The spectrophotometric characterization of the berries extract showed an antioxidant activity on the DPPH radical screening assay, of 88.52±1.92 mg TE/g DW. The chromatogram from the HPLC characterization revealed a rich polyphenolic profile for the berries extract, whereas for the antibacterial activity, it was observed that *S. aureus* was more sensitive against the inhibition action of the extract, compared with the other bacterial strains, with an inhibition zone diameter of 27.50±0.71 mm on the Agar Well Diffusion Method. Myrtle berries extracts have found application in different industrial sectors, regarding the food industry this medical and aromatic plant represents an interesting source mainly related to its antioxidant and antimicrobial activity. Further research studies can be oriented toward designing functional food products to meet the demanding requests of the consummators.

Keywords: *Myrtus communis*, bioactive compounds, antibacterial activity.

OP. 3.3.

Improving winemaking technology for black grapes in the Terasele Dunării IG wine region by using the *saignée* technique

Bogdan Bocăneală*, Gabriela Râpeanu, Nicoleta Stănciuc, Oana Emilia Constantin, Iuliana Aprodu

"Dunărea de Jos" University of Galati, Faculty of Food Science and Engineering, 111 Domnească Street, RO-800201 Galați, Romania;

*Corresponding author: <u>bogdan.bocaneala@yahoo.com</u>

Abstract

In the current climate context, winegrowers and winemakers face increasingly greater challenges, much more often than in the past. If in the past we were talking about some excellent years, which led to preserved specimens even today, when the perfect climatic conditions met oenologists who mastered both the science and the art of winemaking, combining traditional aspects with spontaneous decisions taken at the moment, and just as rarely, very poor years, most years falling within average standards, of sufficient quality for the wines to be put on the market, nowadays the "exception" tends to turn into the rule. Despite technological progress, it is becoming harder and harder to achieve optimum wine production year after year with consistent quality. Some solutions, including harvesting later, combined with some additives to recover the structural components lost during the prolonged maturation (acids, phenolic components) seemed to give some results, especially for highvolume producers, but with enough lapses for the premium market and with new problems (more unstable wines). For the higher quality segment and wines designed to be aged, the oenologists had to look for other solutions. One of these solutions has its roots in a fairly old winemaking technique, called saignée. Also known as bleeding, the technique involves short-term contact between the must and the grape skins and then removal (bleeding off) of a part of the free-run juice (usually 30%) from macerated red grapes. It has the benefit that using the natural components of the grapes and can improve both rosé and red wines. The study aimed to test the bleeding technique for an international grape variety, Merlot, with the largest area planted (worldwide and also in our country). We have chosen the Terasele Dunării area for its tradition with this variety and because of the top-quality grapes produced in this region. The test was performed on the 2023 vintage, a very difficult year, with ripening problems met in almost every region of our country.

The results led us to two conclusions: first, the technique gave good results on the Merlot, being applicable without discussion to this type of grape.

The second conclusion was that indeed, comparable to a modern Merlot rosé (made through direct pressing), especially in the driest years, the saignée technique brought more aromatic intensity, with a pretty nice pale ruby color (closer to a traditional rosé wine).

Keywords: grapes, Merlot, color, aroma, saignée, rosé.

OP 3.4.

The evaluation of biodegradability characteristics of food packaging papers based on xylan hemicellulose composite coatings

Mirela Roman (Iana-Roman)^{a*}, Rodica Mihaela Dinică^b, Vasilica Barbu^c, Gabriela Elena Bahrim^c, Petronela Nechita^d

^aDunărea de Jos University of Galați, Romania, Doctoral School of Fundamental and Engineering Sciences,; ^bDunărea de Jos University of Galați, Romania, Faculty of Sciences and Environmental; ^c Dunărea de Jos University of Galați, Romania, Faculty of Food Science and Engineering; ^dDunărea de Jos University of Galați, Romania, Faculty of Engineering and Agronomy Brăila; ^{*}Corresponding author: Mirela Roman, e-mail: <u>mirela.roman@ugal.ro</u>

Abstract

In the past years, the research on biodegradable food packaging materials have been extensively reported worldwide, to contribute at decreasing of discarded packaging waste quantity in different environments. It is known that the most part (about 95%) of food packaging and more than a third are not collected or recycled. In this context, the utilization of plant biomass materials could be a promising alternative for the production of food packaging. These materials are biodegradable, from renewable resources, abundant and relative cheaper compared with petroleum-based packaging materials. Cellulose based materials are appropriate to design the package which meet the food products requirements. By coating of paper materials with homogenous or composite dispersions based on natural polymers, the properties specific for food packaging products such as: barrier to water, water vapors, oil and grease, oxygen and microbial attacks, can be obtained. In this paper, a combination of xylan hemicelluloses and their derivatives with other natural polymers (chitosan and nanocellulose) and mineral oxide nanoparticles (ZnO) was performed to obtain the uniform coatings for paper surface treatment with the aim to improve the properties required for food packaging. In order to investigate the biodegradability capacity, the paper samples coated with above mentioned formulas were analysed by soil burial degradation test according to ASTM D5988-12. The biodegradation rate was obtained from measurements of weight losses and the CO_2 production after 7, 14, 28 and 42 days of soil burial. The surface morphology of the coated papers before and after 28 and 42 days of soil burial was examined by optical microscopy techniques. Before and after biodegradation period, the soil used for burial of paper samples was examined regarding the microorganism's growth. The tests were performed by counting of the colony-forming units on plates with PDA with and without Chloramphenicol toward promoting the growth of filamentous fungi and for the counting of single-celled microorganisms, respectively. After 28 day of soil degradation, has been observed that all the samples of coated papers reach similar degradation ratio. After 42 days in soil burial conditions, the studied samples showed a biodegradation rate of 70 to 90%. Comparing with reference soil, the number of colony-forming units was higher for the soil used for sample burial. **Keywords:** biodegradability rate; xylan hemicellulose; chitosan; composite coatings; paper coatings; paper food packaging

OP. 3.5.

Efficacy of chitosan, pectin and xanthan as cold gelling agents in emulsion gels enriched in polyunsaturated fatty acids to be used as pork backfat replacers in beef burgers

Nicoleta Cîrstea (Lazăr) ^{a,b*}, Violeta Nour^b, Alexandru Radu Corbu^b, Georgiana Gabriela Codină^c

^aFaculty of Food Science and Engineering, Dunărea de Jos University of Galati, Domnească Street 111, 800201 Galati, Romania

^bDepartment of Horticulture and Food Science, University of Craiova, 13 AI Cuza Street, 200585 Craiova, Romania

^cFaculty of Food Engineering, Stefan cel Mare University of Suceava, 720229 Suceava, Romania. * Corresponding author: <u>nl135@student.ugal.ro</u>

Abstract

This study aimed to develop stable emulsion gels enriched in polyunsaturated fatty acids, formulated with a mixture of olive and linseed oils, by incorporating two different stabilizers – pea and soy protein isolates, and three different cold gelling agents – chitosan, pectin and xanthan, to be used as pork backfat replacers in beef burgers. Reformulated burgers were produced by total pork backfat replacement and compared to normal fat burgers. Color, pH, stability and textural properties of the emulsion gels were determined at processing and after 7 days of storage. Proximate composition, fatty acid profile, technological and sensory attributes were evaluated after burger processing while color, pH, textural parameters and lipid oxidation were monitored in burgers during 10 days of refrigerated storage (4 °C). A reduction of the fat content by 21.49% to 39.46% was achieved in the reformulated burgers as compared with the control, while the n-6/n-3 ratio decreased from 5.11 to 0.62. The highest moisture and fat retention were found in reformulated burgers made with xanthan, both with pea and soy proteins, however, their textural properties have been negatively affected. The reformulated burgers made with chitosan were rated highest for sensory attributes and overall acceptability, not significantly different from the controls.

Keywords: reformulated beef burgers; emulsion gels; pea protein isolate; soy protein isolate; texture; technological properties; lipid composition; oxidative stability

OP. 3.6.

Pumpkin peel powder as a bioactive powder for the manufacture of carotenoidenriched yogurt

Roxana Nicoleta Rațu (Gavril)^{a,b*}, Oana Emilia Constantin^a, Nicoleta Stănciuc^a, Iuliana Aprodu^a, Gabriela Râpeanu^a

a"Dunărea de Jos" University of Galati, Faculty of Food Science and Engineering, Domnească Street, 111, RO-800201, Galati, Romania

^b "Ion Ionescu de la Brad" University of Life Sciences of Iasi, Faculty of Agriculture, Department of Food Technologies, 3 Mihail Sadoveanu Alley, 700489 Iasi, Romania * Corresponding author: <u>roxana.ratu@gmail.com</u>

Abstract

In the pursuit of enhancing the nutritional profile of dairy products through natural additives, this study investigates the potential of pumpkin peel powder as a bioactive ingredient for the production of carotenoid-enriched yogurt. Pumpkin (genus *Cucurbita*; family *Cucurbitaceae*) is a winter squash with high traditional nutritional and medicinal values.

Pumpkin peel, often discarded as waste, is a rich source of carotenoids, particularly β -carotene, which are essential for human health and possess various biological activities such as antimicrobial, antiviral, cytotoxic, and antitumor activities. The incorporation of pumpkin peel powder into yogurt serves not only as an innovative approach to valorise food by-products but also as a means to naturally fortify dairy products with essential nutrients. The experimental design involved the integration of varying concentrations of pumpkin peel powder (2% and 4%) into yogurt during the fermentation process. The effects of these concentrations on the physicochemical properties, phytochemical properties, color and sensory attributes of the yogurt were thoroughly analyzed. The results demonstrated that the addition of pumpkin peel powder significantly increased the carotenoid content (0.50 -1.10 mg/100g dw) and antioxidant activity (39.12-40.13 µmol Trolox/100g dw) of the yogurt, thereby enhancing its nutritional value without adversely affecting its sensory properties. Furthermore, the yellowish color from the enriched yogurt indicates an improved color characteristic which is acceptable to panelists due to the enriched yoghurt's generally acceptable sensorial characteristics. The findings suggest that the incorporation of bioactive powders derived from food by-products into conventional food products can be a sustainable strategy for improving nutritional quality and addressing environmental concerns. This approach has the potential to inspire the development of a range of functional foods that contribute to a healthier diet and a more sustainable food system. Keywords: carotenoids, pumpkin peel, functional food, antioxidants, phytochemicals

OP. 3.7.

Recovery of phenolic compounds from wild bilberry, blackcurrant and blackberry pomaces by maceration and ultrasound-assisted extraction

Ana Maria Blejan^a*, Violeta Nour^b, Alexandru Radu Corbu^b and Simona Mariana Popescu^b

^a "Dunărea de Jos" University of Galati, Faculty of Science and Environment, 47 Domnească Street, RO-800008, Galati, Romania

^bDepartment of Horticulture and Food Science University of Craiova, 13 AI Cuza Street, 200585 Craiova, Romania

* Corresponding author: <u>ana.blejan@ugal.ro</u>

Abstract

Wild bilberry, blackcurrant and blackberry fruit pomaces obtained after industrial juice processing were extracted in water, 1% citric acid, 40%, 60% and 80% (v/v) aqueous ethanol using two extraction methods: maceration and ultrasound-assisted extraction. The total phenolics content (TPC), total anthocyanins content (TAC), and DPPH radical scavenging activity (RSA) were quantified in the extracts. TPC was about 2.3-3.2 times higher in ethanolic extracts as compared with the water extracts. The extracts made in 60% aqueous ethanol showed the highest values of TPC, TAC and RSA irrespective of extraction method and pomace matrix while water and 1% aqueous citric acid were very little effective in recovering anthocyanins and phenolic compounds. Bilberry pomace extracts made in 60% ethanol using maceration presented the highest TAC (585.21 mg CGE/L), TPC (3381.82 mg GAE/L) and RSA (2.05 mmol Trolox/l). The results showed that bilberry, blackcurrant and blackberry fruit pomaces can be a valuable source of bioactive compounds to be used in food supplements and functional foods.

Keywords: fruit pomaces, extraction, total phenolics content, total anthocyanins content, DPPH radical scavenging activity, correlations

OP 3.8.

Combined experimental and *in silico* Investigations on the effect of microbial proteinase on the intrinsic bioactivity of the egg proteins

Mihaela Brumă (Călin), Iuliana Banu, Nicoleta Stănciuc, Gabriela Râpeanu, Ina Vasilean, Iuliana Aprodu^{*}

"Dunărea de Jos" University of Galați, Faculty of Science and Engineering, 111 Domnească Street, RO-800201, Galați, România *Corresponding author: iuliana.aprodu@ugal.ro

Abstract

Dietary proteins are hydrolysed by gastric, pancreatic and enteral enzymes when passing the human digestive system. A mixture of oligopeptides and free amino acids is usually obtained through proteins hydrolysis at the end of digestion. This breakdown of proteins to low molecular weight compounds is crucial for achieving desired physiological benefits, such as absorption and reduction or avoidance of undesired reactions, like those responsible for the inappropriate immune response. However, some proteins are resistant to gastrointestinal digestion, resulting in reduced hydrolysis. In case of the egg proteins, mainly the reduced activity pepsin and trypsin was associated to the IgE-mediated allergy in sensitive subjects. The aim of the study was to investigate the potential of using the microbial proteinase K for modulating the bioactivity of the egg proteins. The obtained results indicated that proteinase K allowed significantly higher hydrolysis degree compared to the enzymes acting in the digestive system. Moreover, the peptides released upon hydrolysis were found to exhibit significantly higher DPPH and ABTS radicals scavenging activity. The bioinformatics tools revealed that mainly the di- and tripeptides originally encrypted in the native egg white and volk proteins are responsible for the antioxidant activity. Finally, proteinase K was found to reduce, by at least 82%, the IgE binding capacity of the egg proteins. Except for a 10 residues long epitope of ovomucoid, proteinase K appeared effective in recognising several peptides bonds in the linear epitopes of the main allergenic proteins from eggs. In conclusion, preliminary egg proteins hydrolysis with microbial proteinase might be a suitable solution for preparing the substrate to be better processed in the human digestive system, such as to finally obtain lower antigenic properties and better antioxidant activity. **Keywords:** egg proteins, microbial protease, antioxidant activity, IgE binding capacity

OP 3.9.

Effect of *Spirulina platensis* and *Moringa oleifera* on growth, hematological, biochemical and immunological parameters of stellate sturgeon (*Acipenser stellatus*)

Geanina Constandache^{a,b}, Mirela Crețu^{a,b}, Alina Dobre^{a,b}, Maria Desimira Stroe^{a,b}, Floricel Maricel Dima^{a,c}, Neculai Patriche^a, Lorena Dediu^b

^aInstitute of Research and Development for Aquatic Ecology, Fisheries and Aquaculture, 54 Portului, RO-800211, Galati, Romania

^b" Dunărea de Jos" University of Galati, Faculty of Food Science and Engineering, 111 Domnească Street, RO-800201, Galati, Romania

^c" Dunărea de Jos" University of Galati, Faculty of Engineering and Agronomy Brăila, 29 Calea Călărașilor Street, RO- 810017, Brăila, Romania

Corresponding author: adobre14@gmail.com

Abstract

Stellate sturgeon (*Acipenser stellatus*), an emblematic species of freshwater ecosystems, is essential for aquatic biodiversity but faces increasing challenges from the environment and human activities.

Sturgeon aquaculture has experienced a notable rise in recent decades, aiming to foster population sustainability.

The present study investigates the effects of *Spirulina Platensis* and *Moringa Oleifera* supplements on the growth, hematological, biochemical, and immunological parameters of Stellate Sturgeon (*Acipenser stellatus*). The main goal was to elucidate the potential benefits of these natural additives in aquaculture practices. Fingerlings were divided into four equal groups to create four experimental variants: C - Control group, where fish were fed with a commercial diet, SP - fish fed with 2% *Spirulina platensis* enriched commercial diet, M – with 2% *Moringa oleifera* enriched commercial diet, and SPM - fish fed with 2% *Spirulina platensis* and 2% *Moringa oleifera* enriched commercial diet. Growth parameters, including weight gain and length measurements, were recorded alongside hematological analyses, biochemical markers, and immunological responses. Preliminary results suggest that supplementation with *Spirulina Platensis* and *Moringa Oleifera* positively influences growth rates and improved hematological and immunological parameters in stellate sturgeon, indicating potential applications in aquaculture for promoting fish health and productivity.

Keywords: sturgeon, Spirulina Platensis, Moringa Oleifera, health benefits, aquaculture

P3.10.

Paraprobiotics obtainment by inactivation of *Lacticaseibacillus paracasei* MIUG BL 80 selected probiotic strain by ultrasonic treatment combined with thermal treatment and mathematical modeling of inactivation kinetics

Marina Pihurov*, Daniela Borda, Mihaela Cotârleț, Gabriela Elena Bahrim

"Dunărea de Jos" University of Galati, Faculty of Food Science and Engineering, 47 Domnească Street, RO-800008, Galati, Romania

* Corresponding author: <u>marina.pihurov@ugal.ro</u>

Abstract

In recent years, a new concept called metabiotics has been introduced to promote the health of humans and animals. One of the subclasses of metabiotics is called paraprobiotics, which involve dead, inactivated, or disrupted probiotic cells. The paraprobiotics have been scientifically proven to increase the functional properties of the fermented products. The present study investigates the efficacy of paraprobiotic production by evaluating the impact of combined ultrasound (US)-assisted thermal (T) treatments on the inactivation kinetics of a selected probiotic *Lacticaseibacillus paracasei* MIUG BL 80 strain isolated from water kefir grains microbiota. The experimental study aims to determine the optimal conditions for paraprobiotic production, which could offer several advantages over conventional probiotics. The samples were subjected to low-intensity ultrasounds at 30 kHz and a pulse amplitude of 80% for 20 minutes. This treatment was followed by heat treatment at temperatures of 65°C, 75°C, and 85°C for 5, 10, 15, 20, and 25 minutes. After this step, the viable cell count was determined using the Koch method, as described by Michelutti et al. (2020).

Additionally, the microbial inactivation kinetics of heat treatment was monitored using the Weibullian model proposed by Peleg and Cole (1998) [3] and Mafart et al. (2002). The results of inactivation kinetics show that as temperature increases, inactivation occurs faster. A 2.5 log CFU reduction was observed after 2.5 minutes at 85°C, 9 minutes at 75°C, and 23 minutes at 65°C. Also, at a temperature of 85°C at inactivation times 6-15 min, the cell's resistance was observed, i.e., the survival of bacteria over a longer period. Considering that ultrasound causes irreversible damage to bacterial cell membranes, generating pores that allow required metabolites to migrate. Chemical bond modifications and protein structure changes also increase membrane permeability. Further, applying heat treatments can result in the rupture of bacterial cell walls, leading to the release of essential components like bacterial lysates, DNA, and cell wall constituents.

It can be assumed that during the resistance fraction, metabolites that have migrated from the damaged cell into the environment favor the resistance of cells that have not yet died. Further studies will focus on testing the obtained paraprobiotics to improve the fermentation process and the bioactive properties of the fermented products.

Keywords: probiotic bacteria, paraprobiotics, ultrasound, and thermal treatments, bioactivity

OP 3.11. Innovative strategies for obtaining apple jams with a reduced degree of enzymatic browning

Lavinia Stan (Boldea), Iuliana Aprodu, Gabriela Râpeanu and Nicoleta Stănciuc

"Dunărea de Jos" University of Galati, Faculty of Food Science and Engineering, 47 Domnească Street, RO-800008, Galati, Romania Lavinia

* Corresponding author: <u>lavinia.stan@yahoo.com</u>

Abstract

The food market contains significant quantities of apple juice that is a good source of monosaccharides, minerals (potassium, phosphorus and calcium), dietary fiber and bioactive constituents such as ascorbic acid, total phenolics, flavonoids and antioxidants. Regular consumption of apple juice in general is associated with a reduced the risk of cancer, cardiovascular disease, asthma and diabetes. The main objective of this study was to use natural anti-browning substances belonging to the class of polyphenols to increase the quality and nutritional parameters for apple juice infused in aqueous hibiscus extract. Therefore, the aqueous extract obtained from the calyxes of *Hibiscus sabdariffa* L. was used to infuse the apples before processing and obtaining the products. In the juice extraction processes, Pectinex® Ultra SP-L, a mixture of pectinases, hemicellulases and -glucanases, was used to increase the juice extraction yield. In addition, the pomace resulting from apple pressing and juice extraction was inoculated with Lactobacillus casei (L. casei 431[®]), to evaluate the ability of polyphenols to stimulate the metabolic activity of probiotics, from the perspective of developing an integrated use in apple processing. After inoculation, the samples were freeze-dried. The apple juice were analyzed for total polyphenols content (TPC), total anthocyanin content (TAC), and antioxidant activity. Sensory analysis was also performed to assess the acceptability of the products. Polyphenol content and antioxidant activity had higher values in infused juices, while heat treatment did not significantly influence the content of polyphenolic compounds, and consequently antioxidant activity. When evaluating the stability upon storage under refrigerated conditions for 60 days, the anthocyanin content decreased significantly from 309.76±15.35 mg C3G/100 mL to 226.26±3.54 mg C3G/100 mL, which represents a decrease of about 27%. The effect of stimulating metabolic activity, similar to prebiotic properties were observed in the case of marc resulting from apple processing with immersion in hibiscus extract. The obtained results allow as to align to the new challenges in the food industry, in order to obtain products with high value in terms of nutritional properties, color and with increased consumer acceptability.

Keywords: Hibiscus, anti-browning, apple jam

SECTION 4 ADVANCES IN ENGINEERING AND MANAGEMENT IN AGRICULTURE AND RURAL DEVELOPMENT

OP. 4.1.

Sustainable managerial practices in implementation of circular economy concepts in Romanian agriculture

Florin-Marian Buhociu^{a*}, Dragoș Horia Buhociu^b

a"Dunărea de Jos" University of Galati, Faculty of Economics and Business Administration, 59-61 Nicolae Bălcescu Street, Galați, 800001, Romania

^b "University of Architecture and Urbanism "Ion Mincu", Bucharest, General Director PNRR, Ministry of Development, Public Works and Administration

*Corresponding author: <u>florin.buhociu@ugal.ro</u>

Abstract

This new economic model is an incentive for innovation in the re-use of materials, components, and products, as well as the creation of new business models. In a circular economy, the more efficient use of materials creates greater value, both through cost savings and through the development of new or existing markets. The need to use Circular Economy (CE) concepts is also given by un forecasts, as current trends in continuous growth are maintained according to the linear production-distribution-consumption-waste model.

Rethinking, recycling, reduction, reuse, resource recovery: the various Rs at the heart of the circular economy are perfectly applicable in agriculture, helping farmers to "produce more, with less". Products that are today discarded, considered to be waste, can be processed, used by the agri-food industry and/or as food for animal consumption and bioenergy production, or can be incorporated into the soil to increase its organic substance content, improving its quality. Integrated agricultural systems to reduce the number of inputs used, such as fertilisers, energy, and plant protection products, should be given more attention. Precision technology, involving a more efficient use of resources, is one of the tools for implementing the circular economy approach. The main specific areas of the circular economy in agriculture and rural development are presented and the study continues by applying CE in agritourism. Are presented principals sustainable managerial practices in implementation of circular economy concepts in Romanian agriculture. Specific indicators are presented regarding the implementation of CE in Romania and the stage, appreciated as unsatisfactory, of the exploitation of this concept in the economy of our country.

Keywords: Circular economy, CE specific activities cycle, specific CE implementation in agriculture, agritourism, sustainable managerial practices, CE implementation in Romania.

OP. 4.2.

Assessment of climate changes on the wine sector

Petruța TUREK Rahoveanu^a, Magdalena TUREK Rahoveanu^b

^{*a*} Research Institute for Agricultural Economics and Rural Development, bld. Marasti nr.61, sector 1, Bucharest, Romania

^b "Dunarea de Jos" University of Galati, Faculty of Engineering and Agronomy, Calea Călărașilor no. 29, Braila, Romania

*Corresponding author email: <u>mturek2003@yahoo.com</u>, <u>turek.petruta@iceadr.ro</u>

Abstract

We evaluate the sustainability of the wine sector through bibliometrics at the European level in the last twenty years.

This evaluation model is a new one in this sector and offers a bibliometric analysis at the European level where 169 types of research on sustainability in viticulture are analysed with the help of the VOS viewer software, by linking the keywords, the author, and the titles of the documents.

The research aims to contribute to the knowledge of the current state of research by identifying the top clusters created from the coupling of documents. The results show the special perspectives at the level of companies and the involvement in the development of European rural communities. Our findings show that viticulture can bring added value, and the proposals are particularly focused on the development of viticulture-related activities, their diversification, health and environmental protection, and a range of social changes.

Keywords: durability, environmental health, business health, viticulture

OP. 4.3.

The potential of urban aquaponic agriculture

Gheorghe Adrian Zugravu, Constanta Laura Zugravu

"Dunărea de Jos" University of Galati, Trans-frontier Faculty, 47 Domnească Street, RO-800008, Galati, Romania * Corresponding author: <u>zugravuadrian@yahoo.com</u>

Abstract

As people worldwide migrate to cities, urban centers expand to accommodate them. Often, this entails repurposing former agricultural lands to support more individuals. Urban farms can cultivate more than just fruits and vegetables; they employ the same water to raise fish through a system called aquaponics. Fish waste fertilizes plants, which clean and filter the water before it returns to the tanks; excess is drained into fish reservoirs. Vertical farming is also environmentally friendly. Aquaponic systems result in very little waste. Vertical agriculture allows growers to use finite space more efficiently, so collectively, we can better utilize established space rather than creating more arable land, leaving more ecosystems intact. Placing farms close to sellers and consumers means fresher produce can reach tables with less reliance on trucks, thus reducing pollution and global warming.

Keywords: aquaponic agriculture, urban area, consumers

OP. 4.4.

Trends in food consumption in Romania

Silvius Stanciu

" Dunărea de Jos" University of Galati, 47 Domnească Street, RO-800008 Galati, Romania *Corresponding author: <u>sstanciu@ugal.ro</u>

Abstract

Food consumption patterns in Romania reflect a combination of local traditions and modern influences. The traditional Romanian diet is rich in meat products and includes a variety of vegetables and grains. Popular dishes include stuffed cabbage rolls, cornmeal porridge, and various soups. Dairy products, bread, and potatoes are also staples. The research aimed to evaluate the changes in dietary consumption patterns in Romania. Data from national statistics on food consumption over the past 30 years was used. The research results showed that in recent years, there has been an increase in the consumption of processed foods and fast food, especially in urban areas. There is also a trend towards a return to organic and traditional foods, driven by growing concerns for health and sustainability.

Romanians have started to consume more fresh fruits and vegetables, and there is increasing interest in more balanced diets and in vegetarian or vegan diets. Economic and cultural changes constantly influence eating habits, diversifying, and modernizing the traditional diet. **Keywords**: food consumption, patterns, Romania

OP. 4.5.

Romania's progress since joining the European Union

Laura-Delia Angheluță*, Florin-Marian Buhociu, Silvius Stanciu

"Dunărea de Jos" University of Galati, 47 Domnească Street, Galați, 800201, Romania *Corresponding author: <u>anghelutald@yahoo.ro</u>

Abstract

Romania's accession to the European Union in 2007 represented the beginning of a continuously dynamic process for the economic development of the country. Although initially Romania aimed to adopt the development principles of European construction by initiating reforms in various fields related to the Community acquis, today Romania has managed to recover part of the development gaps, the contribution of European funds being essential during this period. This paper aims to present the contribution that European funds have on the development of Romania for the three pillars: agriculture, industry, and services. We will also present an analysis regarding the absorption of European funds because of the two funding programmes: 2007-2013, respectively 2014-2020, and the new objectives that Romania aims for regarding the current financial framework 2021-2027. The high degree of absorption of funds for agriculture and rural development represents an equally great need for the future to achieve alignment with European agriculture and adaptation to climate change.

Keywords: EU funds, economic development, cohesion policy, public authorities.

OP. 4.6.

Rural development in region 2 southeast through financing scenarios for unskilled labour

Lavinia Daniela Balasan^{*}, Florin Marian Buhociu, Cristinel Ferțu

"Dunărea de Jos" University of Galati, 47 Domnească Street, Galați, 800201, Romania *Corresponding author: <u>lavinia.balasan@yahoo.com</u>

Abstract

The impact of agriculture nowadays is increasingly important. Today, modern agriculture no longer has the role of creating food products only. Most of the time Rural is seen as a development promoter socio-sustainable economic growth due to the vision of continuous development of rural areas. In this article it set out to objectively analyze the agricultural sector and rural development in the South-East region of Romania, studying the elements on which the potential for agricultural development is based, but also how it can evolve with the help of the workforce in this region. I set out to create a website based on the advice of small rural entrepreneurs that evolves gathering information in realistically identifying all the strengths and concentrating them in the region's potential innovation. The agrarian system has come up with a new concept, namely regional development, a concept that includes the set of economic activities taking place within a region, the investments made in the private sector, the reduction of the unemployment rate and, above all, the proposals initiated to increase the standard of living.

Keywords: rural, labour force, development, region, population.
OP. 4.7.

IoT crop management solutions

Daniel George Serban^{a,b}, Emanuela Lungu^{a,b}. Florina Loredana Serban^b, Maria Magdalena Turek Rahoveanu^a

^a"Dunarea de Jos" University of Galati , Romania ^bAgricultural Research Development Station of Braila, Braila, Romania *Corresponding author: <u>danielserban2007@gmail.com</u>

Abstract

The rising and developing economies stand to gain significantly from the Internet of Things (IoT) in terms of social and economic advantages. It has been widely applied in the field of agricultural management, allowing farmers to monitor and manage their crops more effectively and efficiently. The usage of IoT in smart agriculture and its possible applications are covered in this study. Additionally, it describes several sensors and actuators that farmers may employ to intelligently communicate from production to selling, tracking and managing their plants in real time. These include harvesting, pest and disease detection, temperature control, and soil monitoring. The new challenge is posed by a fully technological world.

Keywords: crop management, IoT, smart agriculture, digital transformation

OP. 4.8.

Efficiency of agricultural crops under the impact of drought

Emanuela Marcu^{a,c}, Ionel Alin Ghiorghe^{b,c}, Daniel Șerban^{a,c}, Gabriela Alina Cioromele^{a,c}, Maria Magdalena Turek Rahoveanu^a

^aDunărea de Jos University of Galați, Faculty of Engineering and Agronomy from Brăila, 29 Calea Călărașilor, 810017, Braila, Romania ^bUniversity of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăsti, Bucharest, Romania, ^cAgricultural Research Development Station Braila, km. 9 Viziru Street, Braila, Romania, E-mails: *Corresponding author: <u>daniel.serban@scdabraila.ro</u>

Abstract

The main objective of the research is to evaluate the efficiency of crops under the influence of drought. In the development of agriculture, a challenge is to obtain high yields under the action of climatic factors. During the research, numerous other secondary objectives were achieved, and starting hypotheses were established, which are verified at the end of the article. The objective of the research falls within the current guidelines of PAM 8, which aims at the efficiency of water use in Romania. The research is located at the Brăila county level, we aimed to evaluate the efficiency of the most vulnerable crops (maize, sunflower) under the impact of water shortage. The study was analyzed over the last 33 years, and the results suggested that the potential of crops is proven by the contribution to the turnover of over 8% that it has in the county's economy. Further research is needed to elaborate on these findings in other counties to have a comprehensive nationwide diagnosis for stakeholders.

Keywords: maize, sunflower, efficiency, drought

OP. 4.9. GIS approach in land evaluation and suitability assessment for alfalfa in Frecăței – Great Brăila Island agrosystem area

Gabriel Marian Pisica*, Maria Magdalena Turek Rahoveanu

"Dunărea de Jos" University of Galati, Faculty of Engineering and Agronomy in Braila, 29 Calea Calarasilor Street, RO-810017, Braila, Romania *Corresponding author: <u>pmgmarian@yahoo.com</u>

Abstract

This study aimed to analyze the appropriateness of land in Frecăței based in Great Brăila Island, Brăila county, for alfalfa production using a Geographic Information System (GIS) toll. To determine appropriate areas for alfalfa production, was used 17 different ecopedologycal criteria: soil properties such as: pH, organic carbon stock etc, soil texture, topography: slope and ground water level, and climate: temperature and rainfall were selected from the literature (MESP 1987) and employed in suitability analysis. Cumulative values for each criterion were used in coming up with output maps using GIS. Each criterion was reclassified and assigned a weighted value. The suitability map in this study could be vital and helpful in management decision options. However, the criteria considered for land suitability evaluation were mainly based on the biophysical environment, and, hence, further studies can be carried out by integrating socioeconomic parameters to improve the suitability results of the study area.

Keywords: alfalfa, land evaluation, crop suitability, GIS

OP. 4.10.

Wine: composition, benefits and contraindications

Viorica Gutan*, Adrian Zugravu

"Dunărea de Jos" University of Galati, 47 Domnească Street, RO-800008 Galati, Romania *Corresponding author: <u>viorica.gutan@gmail.com</u>

Abstract

Considered the second fluid after blood in terms of the complexity of its composition, wine contains on average 85% water, 12% alcohol and within the remaining 3%, 1,000 other elements such as residual sugar, potassium, magnesium, sodium, iron, calcium, iron, phosphorus, plus polyphenols, sulfates, nitrates, lactic acid, amino acids - so pretty much everything the human body needs for good functioning. The author of this publication studies the composition of wine, the composition of vitamins and minerals in wine, the health benefits of wine consumption, the risks, and contraindications of wine consumption. This research was developed based on scientific research, encyclopedic data, and periodical publications. **Keywords**: wine, minerals, vitamins, benefits, contraindications

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OP. 4.11. Motivation and organizational behavior to be successful in business

Ciprian Grigorescu*

"Dunărea de Jos" University of Galati, 47 Domnească Street, RO-800008 Galati, Romania *Corresponding author: <u>ciupix@yahoo.com</u>

Abstract

This article presents and analyses the Key to growth in any business. It seems that this is in the behaviour of the employees.

Motivation in organizational behaviour has a real important role to play in business success. This article might suggest some proven strategies, methods, and tips to train productive, dedicated, and motivated employees. The behaviour of staff working in organization is the most important factor that determines the business success. The work to improve organizational behaviour is very important because through its success, time is saved, productivity increases, and profit can be increased. Organizational behaviour represents the analysis of how people act and behave in organizational settings. It explains the dynamics that arise between individuals and groups in a workplace. Organizational behaviour is the analysis of how people act and behave in organizational structures. It shows the dynamics that occur between groups and individuals in the workplace and how an organization itself behaves, or how these relate to and influence each other. This is because the relationship between employees will determine their efficiency and compatibility is essential to avoid unpleasantness. Without unity among employees, it is impossible to achieve long-term business success. This can be achieved by delving into what motivates employees, how they interact with each other and with management. This is what organizational behaviour is all about. Also, this study of organizational behaviour presents it's important elements.

Keywords: business, success, behaviour, employees, Romania

OP. 4.12

Challenges and perspectives of the development of renewable energies in Moldova and Romania

Tatiana Chiril*, Alina Crăciun

"Dunărea de Jos" University of Galati, 47 Domnească Street, RO-800008 Galati, Romania * Corresponding author: <u>Tatiana.Chiril@ugal.ro</u> <u>tatiana.chiril2015@gmail.com</u>

Abstract

Moldova and Romania, both situated in the Eastern European region, share common goals of increasing renewable energy production and diversifying their energy sources. This paper analyses the challenges and perspectives of renewable energy development in these two states. Challenges: Limited financial resources: Mobilizing the necessary capital for renewable energy projects remains a challenge, given the current reliance on traditional energy sources. Inconsistent regulatory framework: The lack of a harmonized and transparent legislative framework can create uncertainties for investors and delay project implementation. Inadequate grid infrastructure: Integrating fluctuating renewable energy sources into existing power grids requires significant infrastructure upgrades. Public awareness: Raising public acceptance of renewable energy technologies is essential for widespread adoption. Perspectives: EU support: The EU Renewable Energy Directive (RED II) and other financial instruments provide a favourable framework for renewable energy development. Declining costs: The costs of renewable energy technologies have fallen significantly, making them more competitive with traditional energy sources. Growing interest: Interest from the public and private sectors in clean energy solutions is increasing, stimulating investment and innovation. Regional cooperation: Regional collaboration can facilitate the exchange of knowledge, resources, and infrastructure, accelerating progress.

Keywords: renewable energy, legislation, power grids, energy models.

OP. 4.13. Overweight and obesity among children in the republic of Moldova and Romania: a preliminary study

Nicolae Mocanu^{*}, Silvius Stanciu

"Dunărea de Jos" University of Galati, 47 Domnească Street, RO-800008 Galati, Romania * Corresponding author: <u>nicolae.mocanu@ugal.ro</u>

Abstract

Childhood overweight and obesity pose significant public health challenges globally, with increasing prevalence observed in both Romania and Moldova. This study draws on national, European, and global public health statistics to shed light on this issue. Utilizing open-access scientific literature from databases such as Clarivate, Google Scholar, and ResearchGate, our research underscores the escalating prevalence of childhood overweight and obesity in these two countries. Factors such as shifting dietary habits, urbanization, rising incomes, and sedentary lifestyles contribute to this trend, as highlighted by studies conducted by the World Health Organization. Primary risk factors include unhealthy dietary patterns, high consumption of calorie-rich and sugary foods, insufficient physical activity, urbanization, and cultural influences. Increased screen time, including prolonged use of electronic devices and television, significantly impacts childhood overweight and obesity. Despite similarities in dietary traditions and educational systems, notable differences exist between the two countries. Romania ranks highest in the European Union for childhood obesity, with approximately 30% of children under 14 being overweight and 15% obese. While Moldova fares better in European rankings, with 11% of children overweight and 2.2% obese, recent trends indicate a concerning rise in these figures. Both Romanian and Moldovan authorities have begun to address these issues through proposed programs and initiatives promoting healthy eating, encouraging physical activity, and raising awareness of obesity-related risks. This study serves as a foundation for ongoing doctoral research, with potential implications for academia, society, and public institutions. Its findings offer valuable insights to inform the development and implementation of effective public policies and intervention programs aimed at improving children's health.

Keywords: overweight, obesity, children, Romania, Moldova

OP. 4.14.

Food consumption patterns in the republic of Moldova: preliminary research

Nicolae Mocanu^{*}, Silvius Stanciu

"Dunărea de Jos" University of Galati, 47 Domnească Street, RO-800008 Galati, Romania *Corresponding author: <u>nicolae.mocanu@ugal.ro</u>

Abstract

The research proposes an analysis of food consumption patterns in urban and rural areas of Moldova. Variables considered include income, education, culture, and dietary traditions. The study, preliminary within the doctoral research stage, explores regional variations and identifies socio-economic factors influencing consumption patterns, with an assessment of the dependency on food advertising media. Findings can guide targeted interventions to promote healthy eating habits and address food insecurity.

Keywords: overweight, obesity, children, Romania, Moldova

OP. 4.15. The competition of economic actors on the market in the republic of Moldova. SWOT analysis of development opportunities

Alexandru Ghencea*, Vitalii Zanet, Silvius Stanciu

"Dunărea de Jos" University of Galati, 47 Domnească Street, RO-800008 Galati, Romania * Corresponding author: <u>ghencea.alexandru.ion@gmail.com</u>

Abstract

This SWOT analysis explores the key aspects of competitiveness in the food retail market in the Republic of Moldova. Examining strengths, weaknesses, opportunities and threats, the study provides broad insight into how internal and external factors influence this crucial sector. Large retail chains in Moldova, such as supermarkets and hypermarkets, have extensive networks, large storage spaces and effective marketing strategies that allow them to reach a wide audience and provide a convenient and affordable shopping experience. Small and medium-sized enterprises face significant difficulties in accessing large markets. Competition with large retailers and other well-established companies means that SMEs often struggle to be seen and heard by consumers. They also have limited marketing and distribution resources, which limits their ability to expand their market presence and reach a wider audience. Strict government regulations and legislative barriers can pose significant obstacles for SMEs. These can include complex compliance requirements, burdensome tax burdens and lengthy bureaucratic processes. Such barriers can limit the ability of SMEs to enter and compete in the retail market, making it difficult to develop and expand their businesses.

Keywords: SWOT, Enterprises, Revenue, Competition, Republic of Moldova.

OP. 4.16.

Food waste and loss in republic of Moldova

Laureana Odajiu*

"Dunărea de Jos" University of Galati, 47 Domnească Street, RO-800008 Galati, Romania * Corresponding author: <u>laureana.odajiu12@gmail.com</u>, <u>laureana.odajiu@ugal.ro</u>

Abstract

The study proposes an extensive analysis of food waste and loss in Republic of Moldova. The research is carried out based on the information provided by the national statistical system, the Food Bank, as well as a draft law on reducing food waste from November 3, 2022. According to the law, measures are applied to prevent food waste and loss, including measures to reduce food waste and regulate the efficient consumption of safe food, including those close to the expiration of the validity period, the limit-date of consumption or close to the expiration of the minimum durability date. Food waste is all food manufactured for human consumption that is lost or thrown/wasted from the production site, ending up in the trash. The implementation of this law could solve problems related to environmental protection, such as food removes methane during decomposition, social order such as combating poverty, or economic: encouraging the competition of suppliers from the Republic of Moldova.

Keywords: Food waste and loss, Republic of Moldova, law, The Food Bank

Analysing the Romanian agricultural sector from the human resources perspective

Beatrice-Simona Manolache*, Silvius Stanciu

"Dunărea de Jos" University of Galati, 47 Domnească Street, RO-800008 Galati, Romania * Corresponding author: <u>beatrice.manolache@ugal.ro</u>

Abstract

Agriculture is one of the fundamental pillars of human society and holds vital importance from multiple perspectives such as: food security, employment and livelihood, contribution to Gross Domestic Product (GDP), sustainability and environment, innovation, and technological development, as well as contributing to national security. The study details, through statistical analysis, the impact of human resources on the agricultural sector in Romania. Utilizing diverse data sets, the research addresses the evaluation of a broad spectrum of indicators, including labour productivity, professional skill levels, workforce fluctuations, and demographic distribution by gender and age. Statistical methods of analysis and modelling were employed, facilitating the identification of causal relationships and key trends. The development of this article utilized national statistical databases, and for the bibliographic documentation, official publications from the National Institute of Statistics, Research Gate, and Google Scholar were reviewed. Although many people are involved in agriculture, this does not guarantee increased efficiency, as many other factors influence productivity, such as: cultivation methods, soil quality, or climate. This aspect is crucial for understanding the social and economic impact of human resources in the agricultural sector. The analysis highlighted a tendency for labour force fluctuation, influenced by seasonality and labour migration, thus affecting the stability and predictability of the entire sector. The study demonstrates the importance of a high level of professional skills in labour productivity in agriculture. The rapid evolution of technology in the agricultural sector underscores the need for a well-qualified workforce capable of adopting and implementing new technologies. The analysis offers a comprehensive perspective on the human resources involved in the activities of the agricultural sector in Romania, with conclusions that are useful from multiple perspectives. The information can be included in the development of effective agricultural support policies, oriented towards professional training as well as technologization. These data can assist in planning strategies for labor force fluctuations. Understanding trends from a human resources perspective can also guide investments in new technologies and strategies for increasing efficiency in the agricultural field. These conclusions emphasize the importance of a well-informed approach to supporting and developing the agricultural sector, in the context of contemporary challenges and technological opportunities. Keywords: human resources, agriculture, Romania

OP. 4.18.

The impact of training programs on performance in Romanian agriculture

Beatrice-Simona Manolache*, Silvius Stanciu

"Dunărea de Jos" University of Galati, 47 Domnească Street, RO-800008 Galati, Romania * Corresponding author: <u>beatrice.manolache@ugal.ro</u>

Abstract

This study aims to analyse the impact of vocational training courses on performance in the agricultural sector in Romania. The agricultural sector in Romania faces numerous challenges, including market fluctuations and the need to adapt to European and global standards.

In this context, vocational training plays a significant role in developing farmers' competencies, directly influencing productivity and sustainability. For the literature review, databases such as ResearchGate, the National Institute of Statistics, and Google Scholar were consulted, along with the websites of the County Agencies for Payments and Social Inspection (AJPIS), specifically their vocational training sections. The analysis focuses on identifying barriers that hinder access to training and on exploring the links between professional skills and competitiveness in Romanian agriculture. Additionally, regional differences in access to education and their effects on economic disparities are examined. The results highlight the need for effective policies that promote and support access to vocational training in agriculture. It is crucial to develop programs tailored to regional specifics and market needs, as well as to strengthen partnerships between educational institutions, agricultural organizations, and local authorities. The absence of measures to improve and support vocational training in Romania's agricultural sector can lead to several negative consequences, both short-term and long-term, such as decreased productivity, inability to adapt to new technologies, deterioration of sustainability, and even a widespread socio-economic impact through an increased unemployment rate among farmers.

Keywords: vocational training courses, agriculture, economic performance, Romania

OP. 4.19.

Non-conformities of products sold at European and national level. An analysis of the 2023 RASFF notifications

Iuliana Conduleț*, Silvius Stanciu

"Dunărea de Jos" University of Galati, 47 Domnească Street, RO-800008 Galati, Romania * Corresponding author: <u>iuliana.condulet@yahoo.com</u>

Abstract

The paper presents an analysis of RASFF notifications and the quality of food products sold both in the European Union and in Romania. The research was carried out on the basis of the Rapid Alert System for Food and Feed (RASFF) for the year 2023. Data were collected and statically represented in such a way that it was firstly demonstrated that both at European and national level, products of non-animal origin are the most found in RASFF notifications, signaling a potential risk for consumers. Secondly, the research highlighted how big is the impact of imports, unharmonized legislation between member states and non-EU states and unbalanced food legislation. The conclusions of the study can be useful to authorities with competences in the field and researchers to regulate the monitoring and control processes so that the number of these notifications decreases from year to year. The work is a section of the doctoral research and substantiates the comprehensive assessment of food security in the South-East Development Region of Romania and the domestic market.

Keywords: RASFF, food safety, import, legislation.

OP. 4.20.

The quality of food products in Romania: a study from 2019 to 2023

Iuliana Conduleț*, Silvius Stanciu

"Dunărea de Jos" University of Galati, 47 Domnească Street, RO-800008 Galati, Romania * Corresponding author: <u>iuliana.condulet@yahoo.com</u>

Abstract

The work traces the foundations of the doctoral research, with the objective of developing the food safety standard on the local market.

A documentation in the period 2019-2023 of food products sold on the Romanian market demonstrated that there is an association between consumer preferences and food quality, as well as between RASFF notifications and market recalls and especially between RASFF notifications and food imports in Romania. The study focused on the quality, safety and origin of food products sold in our country. Data from the RASFF platform and from ANSVSA releases regarding market recalls were collected, analyzed and compared so that the conclusions of the paper highlight two major aspects. The first is due to the non-uniform and constantly adapting legislation, and the second is given by the large number of imports influenced by the insufficiency of production in Romania.

Keywords: Romania, imports, recalls, notifications

OP. 4.21.

Strategies for increasing economic competitiveness at the current stage

Alexandru Ghencea*, Silvius Stanciu

"Dunărea de Jos" University of Galati, 47 Domnească Street, RO-800008 Galati, Romania * Corresponding author: <u>ghencea.alexandru.ion@gmail.com</u>

Abstract

In 2017, several retail chains from the Republic of Moldova decided to collaborate to positively influence the dialogue with the national authorities. This joint initiative culminated in the creation of the Employers' Association of Internal Trade Subjects, called "ProBiz". This strategic move, made in February 2017, took place in a legislative context full of changes, when the Parliament implements important changes in domestic trade legislation and in the Contravention Code, thus affecting the relations between retail chains and their suppliers. The experience accumulated by these companies in the local market, some active for more than two decades, was a key factor in their joint approach. One of the key projects started by the "ProBiz" Association is the development of a Code of Best Practices. This code is structured as 11 fundamental principles that govern the food supply chain between traders and suppliers. Through this initiative, the founding retailers of ProBiz commit to adhere to these principles in their commercial activity, thereby highlighting a voluntary commitment to ethics and transparency in business.

Keywords: enterprises, retail, ProBiz Association, commercial activity, Republic of Moldova.

OP. 4.22.

Exploring rural development in Galați county: preliminary findings

Camelia Chiculiță (Epure)*, Silvius Stanciu

"Dunărea de Jos" University of Galati, 47 Domnească Street, RO-800008 Galati, Romania *Corresponding author: <u>stefan71us@yahoo.com</u>. <u>camelia.epure@ugal.ro</u>

Abstract

The paper proposes an analysis of rural development in Galați County. Situated in the eastern region of Romania, the county has a predominantly agricultural economy, with activities such as agriculture, animal husbandry, and fishing playing an important role in the sustainability of rural communities. There are various initiatives and projects with European funding aimed at improving living conditions and stimulating the local economy. One of the key directions for rural development in Galați County is the modernization of infrastructure, including roads, water and sewage networks, and access to healthcare and education services. Additionally, support programs for farmers and small agricultural producers are essential for boosting the agricultural sector and increasing incomes in rural areas.

Promoting rural tourism and local production can also play a significant role in diversifying the rural economy and generating new business opportunities and jobs. The implementation of policies and programs for sustainable rural development can contribute to improving living standards and economic prospects in Galați County.

Keywords: rural development, project, European funds, Galați county

OP. 4.23.

Digitalizing rural Romania: evolution and perspectives

Camelia Chiculiță (Epure)*, Violeta Leoca, Silvius Stanciu

"Dunărea de Jos" University of Galati, 47 Domnească Street, RO-800008 Galati, Romania * Corresponding author: <u>stefan71us@yahoo.com</u>. <u>camelia.epure@ugal.ro</u>

Abstract

The rsearch provides an in-depth analysis of the digitalization process unfolding in rural Romania, set against the broader European context. Drawing upon official data from both national and European statistical systems, the study highlights the significance of rural development as the second pillar of the Common Agricultural Policy at the European level. It complements the first pillar, focused on income support and market measures, by fostering social, economic, and environmental sustainability in rural areas. Key findings reveal a notable surge in household internet access rates across rural Romania in recent years. While internet usage among the rural population has increased, there remains ample room for enhancing service quality to ensure equitable and robust coverage nationwide. The article also discusses the potential of European funding directed towards the "Smart Villages" initiative as a catalyst for driving digitalization efforts in rural regions.

Keywords: rural area, Romania, European funds, digitalisation

OP. 4.24. Smart villages initiative in Romania: driving rural development through digital innovation

Rodica Aparaschivei (Bârlă)*, Silvius Stanciu

"Dunărea de Jos" University of Galati, 47 Domnească Street, RO-800008, Galati, Romania *Corresponding author: <u>rodica.barla@yahoo.com</u>

Abstract

This article explores the Smart Villages initiative in Romania, aimed at modernizing and sustainably developing rural communities through digital technologies and innovative solutions. The objectives of the initiative include improving digital infrastructure, enhancing access to quality healthcare and education services, supporting local economic development, and promoting rural tourism. Various technologies are being implemented to address specific challenges faced by rural communities, such as high-speed internet, environmental and agricultural monitoring systems, waste management solutions, and energy-efficient public lighting. While still in its early stages, there is increasing interest from local authorities, NGOs, and the private sector in implementing these projects. These efforts are seen as crucial tools for counteracting demographic and economic decline in rural areas and promoting a more sustainable and prosperous living environment for residents.

Keywords: rural development, Smart Villages, Romania

OP. 4.25. Rural development initiatives in Buzău county: progress and challenges

Rodica Aparaschivei (Bârlă)*, Silvius Stanciu

"Dunărea de Jos" University of Galati, 47 Domnească Street, RO-800008, Galati, Romania *Corresponding author: <u>rodica.barla@yahoo.com</u>

Abstract

The paper provides insights into rural development efforts in Buzău County, addressing various economic, social, and environmental aspects. Key focus areas include agriculture, rural tourism, infrastructure improvement, and local projects and initiatives. Agriculture remains a major sector but faces challenges such as access to modern technology and sustainable resource management. Rural tourism presents opportunities for economic diversification and cultural promotion. Infrastructure development, including roads and healthcare services, is crucial for overall progress. Local projects aim to enhance quality of life through skills development, support for small businesses, and cultural preservation. Moving forward, collaborative efforts involving local authorities, rural communities, and the private sector are essential for fostering a prosperous and sustainable future for Buzău County.

Keywords: rural development, Buzau County, Romania

OP. 4.26.

The role of online platforms in hunting tourism: facilitating connections and services

Raluca-Beatrice Costea (Voinea)*, Silvius Stanciu

"Dunărea de Jos" University of Galati, 47 Domnească Street, RO-800008, Galati, Romania *Corresponding author: <u>office@go-smart.ro</u>

Abstract

This article delves into the realm of online platforms catering to hunting tourism, serving as digital intermediaries between hunters and hunting services. These platforms offer a plethora of features including booking facilities, destination insights, guide services, and logistical support. They empower hunters by providing access to diverse hunting opportunities, facilitating comparison, and enabling convenient online reservations. Moreover, these platforms streamline communication between hunters and service providers while managing trip logistics. However, caution is advised regarding the credibility of listed service providers and adherence to hunting regulations.

Keywords: online platforms, hunting tourism, Romania

OP. 4.27.

Labor force in Romanian agriculture: a regional analysis

Adrian Petre Liptac^{*}, Silvius Stanciu

"Dunărea de Jos" University of Galati, Domnească Street, 111, RO-800201, Galati, Romania *Corresponding author: <u>adrian.liptac@ugal.ro</u>

Abstract

This article investigates the evolution and characteristics of the labour force in Romania's agricultural sector.

Through the analysis of statistical data and recent trends, changes in the composition and distribution of agricultural labor force are highlighted. Aspects such as rural-urban migration, trends in the aging of the agricultural workforce, and the influence of technology on employment requirements are discussed in detail. Additionally, current challenges and opportunities related to agricultural labor force are examined, including the impact of agricultural policy and prospects for rural development. The analysis provides a comprehensive understanding of the dynamics of the agricultural labour force in Romania and suggests directions for future policies and initiatives in this crucial area.

Keywords: agriculture, labour force, European funds

OP. 4.28.

The fish market in Romania: consumption, evolution, and future outlook

Mihaela Pila^a

^a"Dunărea de Jos" University of Galati, 47 Domnească Street, RO-800008 Galati, Romania *Corresponding author: <u>mpila@ugal.ro</u>

Abstract

The paper proposes an analysis of consumption trends in the fish market in Romania. The research utilized information provided by the National Institute of Statistics, the Ministry of Agriculture and Rural Development, and publications from industry associations. Although fish consumption has seen a slight increase recently, with an annual average of 6-8 kg per capita, the population in Romania is still below the European average of approximately 20-25 kg. The positive trend in recent years has been driven by increased awareness of the health benefits of fish, as well as the diversification of market offerings. Fish consumed in Romania is sourced less from domestic sources and more from imports. Significant imports of fish and seafood come from countries such as Norway, Spain, and the Netherlands, due to the demand for varieties not available locally. In recent years, consumer behaviours have evolved, with a growing interest in fresh fish products and organic or certified fish options. Supermarkets and restaurants now offer a wider range of fish-based products, and consumers are becoming more educated and selective in their choices.

Keywords: fish market, consumption, trends, patterns, Romania

OP. 4.29.

Sorghum-culture of the future in Europe

Carmen Lazăr (Gurgu-Lazar)*, Maria Turek Rahoveanu, Silvius Stanciu, Florin Buhociu, Adrian Zugravu

"Dunărea de Jos" University of Galati, 47 Domnească Street, RO-800008, Galati, Romania *Corresponding author: <u>carmenlazar1st@gmail.com</u>

Abstract

Sorghum has a high biological and agricultural potential, which why it is grown by many farmers, especially in Europa. Sorghum is adapted to a wide range of environmental conditions and can produce significant yields under conditions that are unfavorable for most other cereals. This adaptability can help farmers in Romania respond to changing climate conditions. Sorghum can become a substitute for maize.

Keywords: sorghum, versatile plant, changing climate, drought tolerance

OP. 4.30. The food industry in the republic of Moldova: a case study on the evolution of industrial value for some of the most important agri-food

Alexandru Ghencea*, Silvius Stanciu

"Dunărea de Jos" University of Galati, 47 Domnească Street, RO-800008 Galati, Romania * Corresponding author: <u>ghencea.alexandru.ion@gmail.com</u>

Abstract

The economic growth of a country is the main factor which determines the future actions of the state's policy. The agri food sector's expansion results in welfare, food security and safety. The process of creating food involves several factors and is constantly changing to meet the needs of consumers. Therefore, it is a multifaceted phenomenon that necessitates ongoing transformation. These instances are evident in the sphere of the agricultural industry, where dietary products originate from farming (like fruit, vegetables, grains, etc.). The continuity of the process extends to food processing, which includes the preparation of food products for consumption, the chain of stages continuing with the food industry, quality control, distribution and logistics, sustainability, and reaching the globalization stage, with food products being sold globally. Food production for commercialization purposes eventually reaches either the national or the international market and is in a continuous state of competitiveness. Thus, it causes the involvement of economic and innovative factors, in which market players, i.e., economic agents, face each other regarding aspects related to quality and innovation of the food products offered, to generate their own revenue. The competition between economic agents encourages them to strengthen their business and innovative spirit, whereas the consumers receive their preferred goods at an affordable price. The lack of competitors on the market creates the necessary conditions for some economic agents to be able to dictate prices on the market. This phenomenon causes the increase in prices of various food and non-food products.

Keywords: enterprises, revenue, competition, food, value, industry, Moldova

OP. 4.31.

Pre-packaged products one of the non-conformities sold

Iulia Maftei*, Florin Marian Buhociu, Silviu Stanciu

"Dunărea de Jos" University of Galati, 47 Domnească Street, RO-800008 Galati, Romania * Corresponding author: <u>iulia6362@gmail.com</u>

Abstract

The Agency for Consumer Protection and Market Surveillance identified non-conformities of prepackaged products that were not properly marked. APCSP inspectors during a planned state control of a warehouse in the municipality of Chisinau identified imported prepackaged products with the actual average weight per lot lower than that indicated on the packaging. Out of 6 batches of products, 1 batch of prepackaged products in the number of 12,560 pieces worth 160,516 lei were improperly marked. Differences in mass on the packaging of the starting product mislead the consumer and make it possible to deceive him. This article refers to: consumer protection regarding nonconformities.

Keywords: prepackaged, market surveillance, batch

PP4.1.

THE FOOD BANK OF THE REPUBLIC OF MOLDOVA

Laureana ODAJIU*

"Dunărea de Jos" University of Galati, 47 Domnească Street, RO-800008, Galati, Romania

*Corresponding author: <u>laureana.odajiu@ugal.ro</u>

Abstract

The study proposes an analysis about the Food Bank of the Republic of Moldova. The Food Bank is a non-profit project that collects, stores, and distributes food products to social projects: services for children, social services offered by NGOs, canteens, and nursing homes.

The recovery of surplus products is done from agricultural producers, from the food industry, from importers, distributors, so they will be distributed to social projects.

Giving away food for free gives organizations the opportunity to accomplish their own mission by supporting people in need and at the same time to reduce food waste.

Food recovery through the Food Bank model means preventing a large amount of waste. In this way energy resources are also saved, so a reduction of CO2 emissions in the atmosphere.

The Food Bank of the Republic of Moldova is carried out according to the model of international Food Banks. Thus, the Republic of Moldova will appear for the first time on the map of food banks in the world.

Keywords: The Food Bank, Republic of Moldova, food products, food recovery.

Keywords: motivation, management, organizational behaviours

PP 4.2.

THE COMPETITION OF ECONOMIC ACTORS ON THE MARKET IN THE REPUBLIC OF MOLDOVA. SWOT ANALYSIS OF DEVELOPMENT OPPORTUNITIES

Alexandru GHENCEA^{*}, Vitalii ZANET, Silvius STANCIU

"Dunărea de Jos" University of Galati, 47 Domnească Street, RO-800008 Galati, Romania

* Corresponding author: <u>ghencea.alexandru.ion@gmail.com</u>

Abstract

This SWOT analysis explores the key aspects of competitiveness in the food retail market in the Republic of Moldova. Examining strengths, weaknesses, opportunities and threats, the study provides broad insight into how internal and external factors influence this crucial sector. Large retail chains in Moldova, such as supermarkets and hypermarkets, have extensive networks, large storage spaces and effective marketing strategies that allow them to reach a wide audience and provide a convenient and affordable shopping experience. Small and medium-sized enterprises face significant difficulties in accessing large markets. Competition with large retailers and other well-established companies means that SMEs often struggle to be seen and heard by consumers. They also have limited marketing and distribution resources, which limits their ability to expand their market presence and reach a wider audience. Strict government regulations and legislative barriers can pose significant obstacles for SMEs. These can include complex compliance requirements, burdensome tax burdens and lengthy bureaucratic processes. Such barriers can limit the ability of SMEs to enter and compete in the retail market, making it difficult to develop and expand their businesses.

Keywords: SWOT, Enterprises, Revenue, Competition, Republic of Moldova.

SECTION 5 ADVANCED RESEARCH IN ELECTRICAL / ELECTRONIC ENGINEERING, SYSTEM ENGINEERING AND INFORMATION TECHNOLOGIES

OP. 5.1.

Improving power factor in a real three-phase power system

Marin George-Andrei^{a,*}, Gaiceanu Marian^b

"Dunărea de Jos" University of Galati, Faculty of Automation, Computers, Electrical and Electronics Engineering, Science nr. 2 Street, RO-800210, Galati, Romania * Corresponding author: marian.gaiceanu@ugal.ro

Abstract

This research focuses on improving power factor, which is a crucial aspect for operational efficiency and reliability. Power factor indicates the efficiency with which the system utilizes electrical energy and is essential for reducing losses and optimizing performance. Enhancing power factor in a real three-phase power system involves identifying and addressing issues that lead to energy losses and suboptimal power quality.

This theme explores the factors influencing power factor in three-phase systems, including devices and loads that can generate reactive power and harmonic distortions. Methods for

measuring and evaluating power factor are discussed in detail, along with techniques and strategies for improvement. Practical implementation of solutions and case studies provide concrete examples of how power factor improvement can be achieved within three-phase power systems.

The economic and operational benefits of improving power factor in a three-phase system are highlighted, including operational cost reduction and a positive impact on energy efficiency. Additionally, relevant regulations and standards are presented to emphasize legal and industrial requirements regarding power factor.



In conclusion, improving power factor in a real three-phase power system is a complex yet essential challenge with significant impact on system performance and durability. Future research and development directions in this field are essential for continuous optimization of energy efficiency and reliability in three-phase systems.

Keywords: improving, power factor, optimizing performance, three-phase power system.

Optimizing energy consumption for sinter cooling fans motors within the control loop

Marin George-Andrei^{a,*}, Gaiceanu Marian^b

"Dunărea de Jos" University of Galati, Faculty of Automation, Computers, Electrical and Electronics Engineering, Science nr. 2 Street, RO-800210, Galati, Romania * Corresponding author: <u>marian.gaiceanu@ugal.ro</u>

Abstract

This research focuses investigated industrial processes aimed at optimizing energy consumption and reducing energy usage for the fans in a sinter cooling system, a crucial aspect for increasing efficiency and reducing operational costs. Linear sinter cooling fans play a crucial role in maintaining the temperature of sintered materials during the cooling process. Therefore, optimizing the energy consumption of the motors powering these cooling fans is fundamental for the overall efficiency of the process.

By implementing these strategies, we efficiently optimized energy consumption for linear cooling fans in sinter processes, utilizing frequency converters and temperature measurements at multiple points as reference. This leads to improved efficiency, reduced operational costs, and enhanced durability.

Keywords: optimizing, cooling fans, sinter, power motors, temperature, saving energy



OP. 5.3.

Artificial neural network based approaches in the medical field: a comparative study of data sets, neural networks, and diagnostic software

Madalina Gabriela Iorga, Luminita Dumitriu, Mihai Culea

"Dunărea de Jos" University of Galati, Faculty of Electrical / Electronic Engineering, System Engineering and Information Technologies, 47 Domnească Street, RO-800008, Galati, Romania * Corresponding author: <u>madalina.iorga@ugal.ro</u>

Abstract

In recent years, the field of artificial intelligence (AI) has experienced exponential growth, revolutionizing various sectors worldwide. With diverse applications ranging from natural language processing to machine learning and artificial neural networks, AI has garnered significant interest and utility. Particularly in the medical domain, AI holds immense potential to enhance not only patient care through diagnostic accuracy, leading to enhanced treatment plans, but also in saving time and resources, enabling doctors to optimize their workflows and improve overall healthcare outcomes. Moreover, AI-driven diagnostic solutions should deliver more personalized and effective care.

This paper presents a comprehensive comparative study focusing on existing medical data sets consisting of medical images obtained from MRIs, CTs, X-rays and other devices. The analysis highlights the essential role of structure, data quality and relevance of medical images.

These images, obtained from diverse sources and representing a spectrum of medical conditions,

form the cornerstone of AI-driven medical diagnostics.

Moreover, the paper investigates a range of artificial neural network architectures employed in medical image analysis, highlighting their distinct mathematical frameworks and diagnostic capabilities. The selection of the neural network architecture strongly impacts diagnostic outcomes due to the distinct mathematical calculations constituting their core components. The choice of ANN architecture can significantly impact diagnostic accuracy and performance, making this comparison essential for informed decision-making in AI-driven healthcare applications.

Additionally, this paper surveys diagnostic software utilizing AI in the medical sector. Through the synthesis of real-world implementations, prevalent trends, challenges, and prospects in AIdriven medical image analysis are elucidated.

In conclusion, this paper underscores the critical importance of medical imaging data in the realm of AI-driven medicine. By addressing these key considerations, researchers and healthcare professionals can continue to advance AI-driven healthcare solutions, ultimately improving patient outcomes and advancing medical science.

Furthermore, it outlines possible future research, including enhancing diagnostic precision and incorporating features such as region-specific detection and disease severity assessment into diagnostic tools. As well as future work can be added Enhancing Dataset Diversity to encompass a broader range of medical conditions, demographics, and imaging modalities. Another branch could be Fine-Tuning Neural Network Architectures which is essential to optimize diagnostic accuracy and efficiency, with a focus on tailoring models to specific medical imaging tasks. **Keywords:** Artificial Intelligence, medical field, survey.

OP. 5.4.

Studies on neural network performance in medical image recognition: a focus on dataset quality

Madalina Gabriela Iorga, Luminita Dumitriu, Mihai Culea

"Dunărea de Jos" University of Galati, Faculty of Electrical / Electronic Engineering, System Engineering and Information Technologies, 47 Domnească Street, RO-800008, Galati, Romania * Corresponding author: <u>madalina.iorga@ugal.ro</u>

Abstract

Artificial intelligence is part of each of our lives nowadays. But, in creating a model of artificial intelligence there are a lot of things to consider from the data set chosen, to the quality of it, the type of Artificial intelligence chosen and the methods of testing

This paper presents a comprehensive study focusing on the quality of datasets available in the medical field for image recognition tasks, particularly in the context of neural network-based approaches. Data sets play an essenctial role in training artificial intelligence (AI) models and evaluating their accuracy. The choice of an appropriate dataset is paramount as it comes in various shapes and sizes, and a larger dataset typically leads to better model performance. Furthermore, the structure of the dataset, particularly the division into training and testing sets, significantly impacts the reliability of model outcomes .

In the medical field, where diagnostic accuracy is of utmost importance, the quality

of the dataset becomes even more critical. A robust dataset is essential for the development of accurate diagnostic tools, as high accuracy is required to meet the stringent demands of medical diagnosis. Therefore, meticulous attention must be paid to dataset quality to ensure the effectiveness and reliability of AI-driven diagnostic systems.

This study emphasizes the significance of dataset quality in future research, irrespective of the AI methodologies employed. By examining various aspects such as dataset size, structure, and division into training and testing sets, researchers can optimize the performance of neural network models in medical image recognition tasks.

Additionally, it underscores the heightened responsibility in the medical field to uphold high standards of dataset quality due to the implications for patient care and safety. **Keywords:** Artificial Intelligence, medical field, data quality.

OP. 5.5.

Optimizing the operation of a three-phase asynchronous motor considering the thermal regime and technological requirements

Marius Solomon ^{a*}, Marian Găiceanu^b, Vasile Solcanu^c

^{a,b,c} "Dunărea de Jos" University of Galati, 47 Domnească Street, RO-800008, Galati, Romania, vasilesolcanu@dedeman.ro, <u>marian.gaiceanu@ugal.ro</u> * Corresponding author: <u>solmarcen@yahoo.com</u>

Abstract

The current volatile economic and financial context requires industrial installations to operate in campaigns and at the maximum limit of capability, in order to optimize energy consumption and maximize production.

The most efficient solution to optimize the operating regime of a 1.9 MW three-phase asynchronous motor powered at 6 KV is to use a medium voltage drives and a software controller provided by a PLC part of the production process.

The limit operating regime of the pump-motor assembly is dictated by the dynamic working regime of the descaling process and the thermic regime of the motor.

The requirement of technological operation at maximum capacity for short periods pushes the operation of the three-phase asynchronous motor to the limit of the operating thermal regime. Optimizing the operation of the engine at variable speed and torque requires analyzing the dynamic evolution of the temperature and finding the best solutions to eliminate it.

Keywords: Three-phase asynchronous motor, Operating regime optimization, Dynamic evolution of the temperature

OP. 5.6.

Characterization and recognition of {P5,C5} -free graphs using double P3 weak decomposition and its applications in combinatorial optimization

Florin Moize^{a,*}, Mihai Talmaciu^b, László Barna Iantovics^c

^a " Dunărea de Jos" University of Galati, 47 Domnească Street, RO-800008, Galati, Romania <u>moizeflorin@gmail.com</u> b "Vasile Alecsandri" University of Bacău, Romania; <u>mtalmaciu@ub.ro</u> c "George Emil Palade" University of Medicine, Pharmacy, Sciences and Technology of Târgu Mureș, Romania <u>barna.iantovics@umfst.ro</u>

* Corresponding author: moizeflorin@gmail.com;

Abstract

The class of {P5, C5 }-free graphs has many applications in the graph theory. Given an NP-complete real-life optimization problem, frequently is important to investigate its complexity in case of instances that are limited to {P5, C5 }-free graphs. Important problems, like cliques determination, coverage with cliques, colourability and domination are NP-complete in {P5,C5 }-free graphs.

There are also recent issues for classes of the {P5,C5}-free graphs class. In this paper, we define and characterize the double P3 weak decomposition, we characterize the {P5,C5} -free graphs using double P3 weak decomposition, we propose a recognition algorithm and some combinatorial optimization problems whose algorithms are of O(n(n+m)) complexity time for this class of graphs.

Keywords: {P5 ,C5}-free graphs;double P3 weak decomposition; recognition algorithms; combinatorial optimization algorithms.

OP 5.7.

Architecture of the telepresence system

Ionel Stănescu*, Marian Gaiceanu

"Dunărea de Jos" University of Galati, Faculty of Automation, Computers, Electrical and Electronics Engineering, 47 Domnească Street, RO-800008, Galati, Romania * Corresponding author: <u>ionel.stanescu@ugal.ro</u>

Abstract

The Covid-19 pandemic was one of the milestones in developing stage of the telepresence systems. The other motivation of the research developing in this direction is to safe access into the harmful places. In this paper the author reveals the architectures of the telepresence systems, the role of the components, and the network integration. The research is orientated to the robot telepresence systems, as well as to Vehicle-to-everything (V2X) communication systems. The telepresence systems perform the sustainable environment making it safe and friendly. The future development of the telepresence system will be emphasized.

Keywords: Architecture, network, telepresence system, V2X, robot.

SECTION 6 FUTURE OF ECO-NANOTECHNOLOGIES, FUNCTIONAL MATERIALS AND COATINGS

OP. 6.1.

Adsorption capacity of zeolite-a functionalized nanofiber membranes for controlled release of plant nutrients

Ionuț Procop, Viorica Mușat*

Laboratory of Nanochemistry/Centre of Nanostructure and Functional Materials/LNC-CNMF, "Dunărea de Jos" University of Galați, 111 Domnească Street, RO-800201, Galați, România *Corresponding author: <u>viorica.musat@ugal.ro</u>

Abstract

This paper explores the possibility of using nanoparticles embedded in nanofibers to release fertilisers in agricultural applications. The excessive use of fertilisers heavily affects the water bodies, creating an imbalance in the soil that damages the environment [1]. Controlling the release of fertilisers has many advantages and can lead to a more sustainable agricultural practice by minimising waste, avoiding runoff, and preventing bioaccumulation. Encapsulating cationic fertilisers into electrospun nanofiber membranes offers many benefits, such as increased functional surface area, biocompatibility, biodegradability and reusability [2,3]. This paper presents the cationic exchange [4] capacity of Zeolite-A embedded into PVDF electrospun membranes to adsorb and release essential nutrients such as Potassium Ions (K+) and ammonium Ions (NH₄+)-based fertilisers. This can ensure the availability of nutrients for a longer time. **Keywords:** electrospinning, nanotechnology, controlled-release fertiliser, adsorption,

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OP. 6.2.

Advanced Approaches in Innovative Functional Materials used in Construction

Elena Ciutac (Nicolaev)*, Nicoleta Bogatu, Viorica Ghisman, Daniela Buruiană

" Faculty of Engineering, Interdisciplinary Research Centre in the Field of Eco-Nano Technology and Advance Materials CC-ITI, "Dunarea de Jos" University of Galati, 47 Domneasca Street, 800008 Galati, Romania"

*Corresponding author: elena.ciutac@ugal.ro

Abstract

This paper focuses on exploring the potential of technologies in obtaining innovative functional materials for the construction industry. The need of developing new functional materials becomes

more apparent for defining construction industry and represents a promising frontier in the development of advanced materials, offering unique properties and functionalities that can revolutionize the field of construction. The paper examines various approaches and techniques used in the research and development of innovative functional materials, including solid wastes structures. The use of advanced approaches can contribute to reducing the consumption of natural resources and minimizing construction waste by optimizing production processes and developing recyclable and biodegradable materials. The integration of construction industry into materials development could completely redefine current standards and practices in the field, opening up new opportunities and challenges in the construction of durable, energy-efficient and environmentally sustainable structures.

Keywords: innovative materials, industry, environmentally sustainable.

OP. 6.3.

The impact of the use of multiple-effect munitions on modern military operations

Tiberiu Alexandru Pirvu^{*}, Nicoleta Bogatu, Viorica Ghisman, Daniela Buruiana

" Faculty of Engineering, Interdisciplinary Research Centre in the Field of Eco-Nano Technology and Advance Materials CC-ITI, "Dunarea de Jos" University of Galati, 47 Domneasca Street, 800008 Galati, Romania"

*Corresponding author: tiberiu.parvu@ugal.ro

Abstract

Modern military operations are profoundly influenced by technological advances, and the development of multiple-effect ammunition plays a critical role in this evolution. This paper explores the impact of using multiple-effect munitions in modern military operations, highlighting the tactical, strategic and operational benefits in the context of advances in nextgeneration weapons. The integration of the latest technology into ammunition development brings a new level of efficiency and adaptability, revolutionizing the way it impacts combat on the battlefield. In conclusion, multiple-effect ammunition enhanced by the application of the next generation of equipment's is an essential tool in the modern military arsenal. This brings significant benefits to the effectiveness, flexibility and efficiency of military operations, contributing to increased survivability and success in complex and dynamic combat environments.

Keywords: Modern military, Next generation weapons, Multiple-Effect Munitions.

OP. 6.4.

Exploring the potential of sequestering greenhouse gases from industry

Valeriu Smeu^{*}, Nicoleta Bogatu, Gabriel Bogdan Carp, Daniela Buruiană

Faculty of Engineering, Interdisciplinary Research Centre in the Field of Eco-Nano Technology and Advance Materials CC-ITI, "Dunărea de Jos" University of Galati, 47 Domnească Street, 800008 Galati, Romania" *Corresponding author: valeriu.smeu@ugal.ro

Abstract

This paper analyzes the possibility of sequestration of greenhouse gases emissions, focusing on recent studies and research in the field. The latest potential in gases sequestration offers several advantages and opportunities in addressing climate change, offering innovative solutions for greenhouses gases emissions capture and storage. Through the industry processes, efficient and sustainable methods for sequestering from the different sources are being explored. The paper examines various technologies and approaches in this field highlighting recent advances and their potential in reducing greenhouses gases emissions and combating climate change. Future perspectives and research directions for the optimization and effective implementation of technologies in greenhouses gases sequestration, thereby contributing to global efforts to protect the environment and promote climate sustainability, are also discussed. **Keywords:** Greenhouse gases, Climate change, Sequestration.

OP. 6.5.

Magnetic shape memory nanocomposites assembled with high speed high pressure torsion

Cristian Ștefănescu, Gheorghe Gurău*

"Dunărea de Jos" University of Galati, Faculty of Engineering, Department of Materials and Environmental Engineering, 111 Domnească Street, RO-800201, Galati, Romania * Corresponding author: gheorghe.gurau@ugal.ro

Abstract

When a severe plastic deformation (SPD) process is performed at high temperatures, it becomes more versatile. Designed originally for the bulk nanoconstruction of hard-to-deform alloys, highspeed high-pressure torsion (HSHPT) is an SPD method used in this research for assembling multiple layers of shape memory nanocomposites. Three hard-to-deform magnetic alloys in the cast state were used. Soft magnetic shape memory alloys, NiFeGa and FePdMn, and a potentially hard magnetic alloy, CoZr, were assembled in various composites. Both grain refinement and strong layer bonding were achieved in ZrCo/FePdMn and ZrCo/NiFeGa composites in seconds. The very short SPD time is specific to HSHPT because of the intense friction that occurs under high pressures, which generates huge amounts of heat. After SPD, the temperature rises in bulk material like a pulse, being dissipated mostly through heat conduction. The SPD parameters were carefully controlled with an advanced automation system using a programmable logic controller. Nevertheless, the major drawbacks of high-pressure torsion were overcome, and large SPD discs were obtained. Various investigation techniques (optical microscopy, scanning electron microscopy, energy dispersive spectroscopy and atomic force microscopy) show well-defined interfaces as well as a fine and ultrafine structure.

Keywords: severe plastic deformation, HSHPT, magnetic shape memory composite

OP. 6.6.

Effective strategies for protecting carbon steel in marine environment

Maria Plescan, Nicoleta Bogatu*, Viorica Ghisman, Anca Lupu, Daniela Buruiană

^aFaculty of Engineering, Interdisciplinary Research Centre in the Field of Eco-Nano Technology and Advance Materials CC-ITI, "Dunarea de Jos" University of Galati, 47 Domneasca Street, 800008 Galati, Romania"

^bFaculty of Medicine and Pharmacy, Interdisciplinary Research Centre in the Field of Eco-Nano Technology and Advance Materials CC-ITI, "Dunarea de Jos" University of Galati, 47 Domneasca Street, 800008 Galati, Romania"

*Corresponding author: <u>nicoleta.simionescu@ugal.ro</u>

Abstract

This paper examines effective strategies for protecting carbon steel against corrosion in marine environments. Seawater's dissolved salts can hasten the corrosion process, and carbon steel is easily corroded in such environments. Corrosion can be avoided and metal structures in marine environments can have their lives prolonged by using the proper protection strategies, such as protective coatings and the use of cathodic protection technology. This paper reviews various strategies and methods available to combat the corrosion of carbon steels and highlights the importance of regular maintenance and inspection of metal surfaces to ensure optimum performance and durability over time. **Keywords:** corrosion protection, marine environment, carbon steel.

OP. 6.7. The recycling of sewage sludge to sustain a sustainable agriculture

Georgiana Ghisman*, Nicoleta Bogatu, Viorica Ghisman, Daniela Buruiană

" Faculty of Engineering, Interdisciplinary Research Centre in the Field of Eco-Nano Technology and Advance Materials CC-ITI, "Dunarea de Jos" University of Galati, 47 Domneasca Street, 800008 Galati, Romania"

*Corresponding author: georgiana.ghisman@ugal.ro

Abstract

The sustainable management of sludge from sewage treatment plants is one of the critical issues facing modern society, due to the recording of an increasing increase in its production, the difficulty of treatment and disposal and, respectively, compliance with the stricter norms and requirements of environment. The main objective of this work is to carry out studies and experimental research on recycling the sewage sludge with the aim of bringing benefits to the soil and developing a new and innovative methodology for the valorization of waste with applicability in agriculture for a circular economy.

Keywords: Sewage sludge, waste, agriculture.

OP. 6.8.

XRD and SEM-EDX investigations of the low-alloy steels BVDH36 andLRAH36 before and after corrosion tests

Adrian Mazilu, Lidia Benea*, Vasile Basliu

"Dunărea de Jos" University of Galati, Faculty of Science and Environment, 111 Domneasca Street, RO-800008, Galati, Romania Faculty of Engineering, "Dunarea de Jos" University of Galati, 111 Domaneasca Street, 800201 Galati, Romania *Corresponding author: <u>Lidia.Benea@ugal.ro</u>

Abstract

In the construction of ship hulls, the main materials used are metallic materials, especially carbon steels and alloy steels. The steel intended for the construction of the ship's hull must fulfill a series of conditions imposed by the rules of the classification registers, that is to ensure the possibility of manufacturing ship constructions under normal technological conditions and safe in operation. However, corrosion is a major limitation with metals as they react with the environment of use. Thus the evaluation of the corrosion resistance of different types of materials remains a major priority in several industries to prevent catastrophic failures and accidents. The purpose of this study is to evaluate the corrosion resistance in natural sea water (Navodari area) of two types of low alloyed carbon steels BVDH 36 and LRAH 36 by electrochemical methods.

SECTION 7 CHEMISTRY - ELECTROCHEMISTRY IN LIFE SCIENCES

OP. 7.1.

Development of phenantroline chemically modified electrodes for diclofenac detection

Ana-Raluca Măghinici, Constantin Apetrei*

"Dunărea de Jos" University of Galati, Faculty of Sciences and Environment, 111 Domnească Street, RO-800008, Galati, Romania *Corresponding author: <u>constantin.apetrei@ugal.ro</u>

Abstract

Recently, there has been an increasing interest in research related to screen-printed carbonbased electrodes due to their broad range of applications in electroanalysis. Diclofenac (DCF) is a nonsteroidal anti-inflammatory medication used to alleviate pain and treat inflammatory conditions. The excessive use of pharmaceutical products could causes a notable impact on the environment. It has been found that modified screen-printed carbon electrodes are effective in the detection and quantification of DCF due to their high sensitivity and selectivity, as well as their ability to provide real-time measurements. Therefore, there is a need for efficient and cost-

effective sensors that can detect and the presence of DCF in real samples. In this study, we aim to develop novel phenantroline (PHEN) based sensors, in the detection and quantification of DCF, a commonly used nonsteroidal anti-inflammatory drug (NSAID), across various pharmaceutical formulations. The compared voltammograms shows minor differences in their electrochemical behavior, with higher intensities observed at higher concentrations.



Keywords: screen printed electrodes, environment, diclofenac, voltammetry.

Fig. 1. Cyclic voltammograms of phenantroline electrode towards 4 different pharmaceutical products

OP. 7.2.

Sideritis spp.-chemical evaluation and biological potential

Alexandra-Mariana Ionescu^a, Andreea-Veronica Botezatu^a, Bianca Furdui^a, Alina Viorica Iancu^{b,D}, Camelia Bratu^c, Costel Vinatoru^c And Rodica-Mihaela Dinica^{a*}

^a"Dunarea de Jos" University, Faculty of Sciences and Environment, Domneasca street, 111, 800201 Galati, Romania

^b"Dunarea de Jos" University, Faculty of Medicine and Pharmacy, A.I. Cuza street, 35, 800010, Galati, Romania

^c Genetic and Vegetal Resources Bank (GVRB), Nicolae Balcescu street, 56, Buzau, Romania ^d Clinical Hospital for Infectious Diseases "St. Cuv. Parascheva", Galati, Traian street, 393, Galati, Romania *Corresponding author: <u>rodica.dinica@ugal.ro</u>

Abstract

Sideritis spp. is part of the genus *Sideritis, Lamiaceae* family, and is often found in Western and Southwestern areas of Europe.[1] It is currently used for gastric healing purposes, but due to its rich composition in polyphenols, flavonoids and terpenoids, it can represent a good starting point

for new therapeutic schemes[2]. This work aims to highlight the chemical composition of the *Sideritis spp.* plants by determining polyphenols and flavonoid content. Based on the main chemical compounds, the antioxidant activity, the reducing power, but also the antimicrobial activities were determined. For all these tests, different methods were used, such as DPPH, Folin-Ciocalteu, the Kirby-Bauer and MIC methods. The obtained results are promising from both chemical and bioactive points of view so that *Sideritis spp.* can be considered for future *in vivo* and *in vitro* testing. In conclusion, these plants can represent a starting point for new phytotherapies in different medical fields, both for chronic and acute diseases.

Keywords: antioxidant activity, antimicrobial activity, chemical composition **References** :

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OP. 7.3.

Investigation of the chemical composition of *Iris Pseudacorus* from the Danube Delta biosphere and cytotoxicity evaluation

Maria Daniela Ionică (Mihăilă)^a, Raluca Răileanu^a, Andreea Veronica Botezatu^a, Alexandra Mariana Ionescu^a, Bianca Furdui^a, Rodica Mihaela Dinică^{a,*}

^a "Dunărea de Jos" University of Galați, Faculty of Sciences and Environment, Department of Chemistry, Physics and Environment, 111 Domneasca Street, Galati 800081, Romania ** Corresponding author: <u>rodica.dinica@ugal.ro</u>, <u>maria.mihaila@ugal.ro</u>*

Abstract

Iris pseudacorus is a species of aquatic plant with diverse chemical composition and offers potential applications in various fields [1,2]. The objective of the current study was to investigate the chemical composition of the extracts obtained from various parts of the plant, as well as to evaluate the different biological activities. Ultrasound-assisted extraction (UAE) was used for the extraction of phytochemical compounds from Iris pseudacorus. The leaves, flowers and roots were dried, ground into powders and then subjected to extraction. Through these green extraction methods, different fractions were obtained using polar and nonpolar solvents, and the fractions were analyzed by chromatographic and spectrophotometric techniques. The results showed that extracts from various parts of Iris pseudacorus plants contain several secondary metabolites known for their potential health benefits, including saponins, flavonoids, hydroxycinnamic acids and polyphenolic compounds. The total content of polyphenols, flavonoids and antioxidant capacity (by DPPH, TAC, FRAP and ABTS methods) were determined by spectrophotometric methods from the literature [3]. The cytotoxic effect of the extracts was determined by the cereal seed germination test. The results indicate a chemical composition rich in compounds with therapeutic properties, suggesting the potential use of its extracts in pharmaceutical, food and cosmetic products.

Keywords: Iris pseudacorus, aquatic plant, antioxidant capacity.

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OP. 7.4.

Detection and quantification of melatonin using graphene-based voltammetric sensor

Andra-Georgiana Trifan, Constantin Apetrei*

"Dunărea de Jos" University of Galati, Faculty of Science and Environment, 111 Domnească Street, RO-800008, Galati, Romania

*Corresponding author: <u>constantin.apetrei@ugal.ro</u>

Abstract

Melatonin, a hormone produced by the pineal gland, plays a crucial role in regulating the sleepwake cycle and various physiological processes in organisms [1,2]. Its precise detection and quantification are essential for understanding its physiological functions and potential therapeutic applications. This study focuses on assessing the capability of graphene-based sensor to detect and quantify melatonin in aqueous solution using cyclic voltammetry as detection method. Following the purification process of melatonin from pharmaceutical products using acetone extraction, a stock solution with a concentration of 2×10^{-3} M was prepared. Subsequently, precise amounts from this stock solution were added to achieve varied concentrations using the addition method. From the calibration results a detection limit of 0.11 μ M and a quantification limit of 0.39 μ M for the graphene-based sensor. These results highlight the efficiency and sensitivity of the sensor in detecting melatonin in solution, suggesting its potential utility in monitoring and investigating the concentrations of this substance in diverse pharmaceutical or biological samples.

Keywords: graphene, sensor, melatonin, cyclic voltammetry.

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OP 7.5.

Comparative study of different methods for measuring antioxidant activity in *Perilla frutescens* extracts obtained using deep eutectic solvents

Ana-Maria Mocanu^a, Andreea Veronica Botezatu^a, Bianca Furdui^a, Sorin Marius Avramescu^b, Camelia Bratu^c, Costel Vînătoru^c, Mihaela Dragoi-Cudalbeanu^d, Rodica Mihaela Dinica^{a*}

^a"Dunărea de Jos" University, Faculty of Sciences and Environment, Galați, Domnească street, 111, Galați, Romania

^b University of Bucharest, Faculty of Chemistry, 90-92, Soseaua Panduri, Bucharest, Romania ^cGenetic and Vegetal Resources Bank (GVRB), Nicolae Balcescu Street, 56, Buzau, Romania ^dUniversity of Agronomic Sciences and Veterinary Medicine Bucharest, Marasti Blvd., 59, Bucharest, Romania

*Corresponding author: rodica.dinica@ugal.ro

Abstract

Plant-derived antioxidants are recognized for their capacity to curb radical reactions by transferring hydrogen atoms or electrons and to disrupt the chain reactions of oxidative degradation. Among the most significant classes of plant-based antioxidants are phenolic compounds, which possess one or more aromatic rings with one or more hydroxyl groups. These

compounds are common secondary metabolites in plants and are categorized into various major families based on their chemical structure, including flavonoids and phenolic acids. The raw material used for extracting compounds consisted of recently dried leaves, flowers and stems from two species of *Perilla frutescens*, one characterized by purple leaves and the other with green leaves, sourced from the Genetic and Vegetal Resources Bank (GVRB) in Buzau, Romania. Among the numerous methods for estimating antioxidant activity, this study focused on the DPPH and ABTS assays. These methods were chosen because they are among the most popular and commonly used ones, owing to their simplicity, speed, sensitivity, and the utilization of stable radicals. In both methods, the antioxidant activity of a tested antioxidant is assessed by measuring changes in absorbance of artificial, stable, and colored radicals—DPPH· or ABTS⁺.

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Keywords: DPPH, ABTS, DES, Polyphenol extraction, Green extraction method, Antioxidant activity

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OP. 7.6.

Sideritis spp. vs rumex spp.-chemical composition

Alexandra-Mariana Ionescu^a, Silvia Teodosiade^a, Andreea-Veronica Botezatu^a, Bianca Furdui^{a*}, Camelia Bratu^b, Costel Vinatoru^b And Rodica-Mihaela Dinica^{a*}

^a"Dunarea de Jos" University, Faculty of Sciences and Environment, Domneasca Street, 111, 800201 Galati, Romania

^b Genetic and Vegetal Resources Bank (GVRB), Nicolae Balcescu street, 56, Buzau, Romania * Corresponding author: <u>rodica.dinica@ugal.ro</u>, <u>bianca.furdui@ugal.ro</u>

Abstract

Rumex spp and *Sideritis spp* represent two genera of plants from two different families which by their chemical composition can be considered potent from a phytotherapeutic point of view. *Rumex* is one of the 50 genera of the Polygonaceae family. This includes approximately 200 species that can adapt depending on their growth area.[1] From a chemical point of view, this genus has a chemical composition rich in many compounds: polyphenols, flavonoids, anthraquinones, proanthocyanidins, and anthocyanins.[2] *Sideritis* is part of the Lamiaceae family with approximately 150 species found especially in the Mediterranean area. The chemical compounds reported in different studies are representatives of the flavonoid, polyphenol, and diterpene classes.[3] This study aims to highlight a specific class of these compounds, namely, anthocyanins. A difference was observed between the two plant species at the level of chemical compounds and in the case of antioxidant activity. These tests were comparatively done using different extraction methods, and the ABTS method for the evaluation of the antioxidant capacity of the extracts.

Funding: This work was partially supported by Internal Grant 2024 of Department of Chemistry, Physics and Environment, Faculty of Sciences and Environment, "Dunarea de Jos" University of Galati, "Evaluation of Natural Organic Compounds With Biologically Active Potential" and ADER grant 5.2.1. – "Conservation and valorization of the genetic heritage of aromatic and medicinal species that can be cultivated on the territory of Romania".

Keywords: antioxidant activity, anthocyanins, chemical composition **References**:

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OP 7.7.

Synthesis of heteroleptic copper(I) thiocyanate complexes and their evaluation in fluorescent detection of pharmaceutical substances

Mirela-Livia Samoilă, Aurel Tăbăcaru*

Department of Chemistry, Physics and Environment, Faculty of Sciences and Environment, "Dunarea de Jos" University of Galati, 111 Domneasca Street, 800201, Galati, Romania * Corresponding author: <u>aurel.tabacaru@ugal.ro</u>

Abstract

Copper(I) complexes have attracted considerable attention during the last decades, due to their great potential in displaying favorable and largely tunable redox and luminescence properties. In a large number of examples the applicability of Cu(I) complexes could be demonstrated as photosensitizers in hydrogen evolution reaction schemes and dye sensitized solar cells, or as emitters in organic light-emitting diodes (OLEDs) and light-emitting electrochemical cells (LECs), or as sensors for oxygen as well as photoredoxcatalysts in various organic reactions. Significant improvements in the design of homoleptic and heteroleptic Cu(I) complexes of the resulted in promising photophysical properties, such as highly luminescent complexes with long-lived excited-states [1,2]. The present work presents the synthesis and characterization of three heteroleptic complexes based on copper(I) thiocyanate and combinations of phosphorus- and nitrogen-donor ligands, along with their evaluation of photoluminescent properties, which shall be used in the fluorescent detection investigations of some pharmaceutical substances from the antibiotic and antiinflammatory classes.

Keywords: copper(I) thiocyanate, heteroleptic complexes, P,N-donor ligands, fluorescent detection

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OP. 7.8.

Biosensors based on tyrosinase used for the detection of olive oils adulteration

Andreea Loredana Comănescu, Andrei Daniel Geman, Constantin Apetrei*

Dunărea "Dunărea de Jos" University of Galati, Faculty of Sciences and Environment, 111 Domnească Street, RO-800008, Galati, Romania

* Corresponding author: <u>Constantin.Apetrei@ugal.ro</u>

Abstract

Olive oil plays a pivotal role in the Mediterranean diet, boasting unique and recognized nutritional and health properties, as well as widely appreciated organoleptic characteristics. Based on the context provided, the scientific study aims to present the main research advances related to the detection of olive oil adulteration reported in the specialized literature. Research efforts have explored the utilization of devices based on electrochemical sensors and biosensors based on tyrosinase for assessing the bioactive compounds in olive oil. The main advantages and limitations of these green approaches with voltammetric sensors, known for their rapid, precise, bioinspired nature, will be discussed, with the aim of identifying future challenges to become a practical quality analysis tool for industrial and commercial applications. Furthermore, comparisons have been made between the results obtained through electrochemical methods and chromatographic methods (HPLC). Suitable correlations results have been obtained using the data obtained by two types of methods.

Keywords: sensors, biosensors, tyrosinase, voltammetry, high-performance liquid chromatography

OP. 7.9.

Chemical composition and antifungal potential of *Cymbopogon citratus* essential oil nanoemulsion against *Aspergillus sp* responsible for bean rot

Davy Moussango^{a,b*}, Ebong Priscil^b, Tanner Wortham^c, Andreea Veronica Botezatu^d, Maria Ionica Mihaila^d, Tchameni Séverin^b, Sameza Modeste^b, Rodica Mihaela Dinica^d

^aUniversity of Douala, University Institute of Technology, Biotechnology laboratory, PO Box 8698 Douala, Cameroon.

^bUniversity of Douala, Faculty of Sciences, Department of Biochemistry, PO Box 2701 – Douala, Cameroon. ^{c"} The Perfumery, 621 Park East Blvd, New Albany, IN 47150, USA.

d"Dunărea de Jos" University of Galati, Faculty of Science and Environment, 47 Domnească Street, RO-800008, Galati, Romania

* Corresponding author: <u>davy.moussango@yahoo.com</u>, <u>rodica.dinica@ugal.ro</u>

Abstract

Kidney bean seeds are prime targets for fungal micro-organisms of the Aspergillus genus. In Cameroon, these pathogens cause 30-45% losses and severely affect the marketability of beans. To combat these pests, farmers use synthetic chemical products, which have numerous drawbacks: increased resistance, environmental pollution and accumulation of chemical residues in foodstuffs. Thanks to their bioactive molecules, antimicrobial properties and technological application in nanoemulsions, essential oils have already demonstrated their great capacity for food preservation. This study aimed to determine the chemical composition of *Cymbopogon citratus* (*Cc*) essential oil (EO) and assess the antifungal potential of its nanoemulsion. *Cc* EO was extracted by hydrodistillation and analyzed by gas chromatography-mass spectroscopy (GC-MS). The nanoemulsion is formulated by cold emulsification under high pressure. This involved subjecting 1g HE, 0.25g Tween 80 and 8.75g distilled water to a series of two rotary shakers at 400 rpm for 3 hours. This was followed by ultrasonication at 55Khz for 30 minutes and particle size analysis. The antifungal potential was determined *in vitro* by incorporation into agar and *in* situ by direct inoculation. CC EO is predominantly composed of Myrcene (12, 11%), Neral (31, 53%) and Geranial (42, 37%). The resulting nanoemulsion is white, homogeneous, milky in appearance and leaves a bluish sheen on the glass wall. The particle size of the formulation is 108 nanometers. The nanoemulsion completely inhibited the mycelial growth of Aspergillus sp at 300 ppm. In situ, NE inhibited necrotic development at 1500 ppm. Cc EO nanoemulsion proved effective against *Aspergillus sp* and can therefore be used as an alternative to chemicals in bean protection.

Keywords: Nanoemulsion, Essential oil, antifungal activity, bean.

OP. 7.10.

Effect of *Syzygium aromaticum* essential oil against fungi responsible for postharvest rot of groundnut seeds

Nguemnang Mabou Lile^{a*}, Ngouana Vincent^b, Wandji Yves^a, Fokom Raymond^c, Anna Busuioc^d, Maria Ionica Mihaila^d, Fekam Fabrice^a, Rodica Mihaela Dinica^d

^aUniversity of Yaounde I, Faculty of Sciences, Laboratory for Phytobiochemistry and Medicinal Plant Study, PO Box 812, Yaounde, Cameroon

^bUniversity of Dschang Faculty of Medicine and Pharmaceutical Sciences (FMSP), Department of Pharmaceutical Sciences, BP 96 Dschang

^cUniversity of Douala, Institute of Sciences Fisheries, Department of processing and Quality control of fishery products, PO Box 8698 Douala, Cameroon

^d "Dunărea de Jos" University of Galati, Faculty of Science and Environment, 47 Domnească Street, RO-800008, Galati, Romania

*Corresponding author: christellemabou@yahoo.fr, rodica.dinica@ugal.ro

Abstract

Groundnut (*Arachis hypogea*) is the 4th most important oleaginous crop in the world. Difficult conservation exposes them to fungal rots during post-harvest which impacts their marketable and nutritional quality. Rather than chemical fungicides that have shown drawbacks to man and the environment, plant-based biofungicides have been advocated. Thus, the present work was initiated with a view to characterize the fungi responsible for the rot of stored groundnut seeds and evaluate the *in vitro* antifungal potential of essential oil from *Svzvajum aromaticum*. Seeds showing the symptoms of rot were collected in a warehouse in the city of Yaoundé. Isolation was carried out on potato dextrose agar (PDA) followed by a pathogenicity test in accordance with Koch's postulate. The most virulent strains were subjected to taxonomic and genomic identification based on sequencing of the « internal transcribed spacer » (ITS) region. The in vitro inhibitory effect of Syzygium aromaticum EO was evaluated on mycelial growth and spore germination of the pathogenic fungi using solid and liquid dilution methods. Five fungal isolates were obtained from symptomatic seeds, but one was found to be more aggressive (Incidence = 100%). It belongs to the species Aspergillus flavus MN069570, confirmed by the sequencing of the 5.8s gene. Syzygium aromaticum exhibits complete inhibition of mycelial growth and spore germination at the minimal inhibitory concentration (MIC) of 1.25 mg/ml. This result shows that the essential oil of *Syzygium aromaticum* could be used in the formulation of a biofungicide to increase the safety and extend the storage time of Groundnuts.

Keywords: Groundnut seed, rot, fungi, Essential oil.

OP. 7.11.

In- depth studies on antioxidant activities of extracts from *Vaccinium secundiflorum* (Ericaceae), rich in polyphenols and flavonoids

Mampionona Michela Rasoanirina^{a,c}, Andrianambinina Razakarivony^b, Dimby Andrianina Ralambomanana^c, Andreea Veronica Botezatu^d, Maria Ionica Mihaila^d, Rivoarison Randrianasolo^a, Rodica Mihaela Dinica^d

 ^a Laboratoire de Chimie Analytique et de Formulation, Faculté des Sciences, Université d'Antananarivo, Madagascar.
^b Laboratoire de Chimie Appliquées aux Substances Naturelles, Faculté des Sciences, Université d'Antananarivo, Madagascar.

^c Laboratoire de Produits Naturels et Biotechnologie, Faculté des Sciences, Université d'Antananarivo, Madagascar.

^d "Dunărea de Jos" University, Faculty of Sciences and Environment, Galați, Domnească street, 111, 800201 Galați, România

*Corresponding author: <u>rmampiononamichela@gmail.com</u>, <u>rodica.dinica@ugal.ro</u>

Abstract This paper presents in-depth studies on the antioxidant activities of some extracts from the aerial part of *Vaccinium secundiflorum*, an endemic plant of Madagascar.

During several years of study, research on the genus *Vaccinium* has shown very important scientific results in terms of chemical compositions and biological activities. In order to determine

which extracts from *V.secundiflorum* have the better antioxidant activity, after liquid-liquid partition, three antioxidant tests (DPPH, ABTS and TAC) have been realized.

In recent studies, the flavonoids and polyphenols content tests have been done and showed that the majority of flavonoids and polyphenols are found in the EtOAc and Aqueous extracts. For the



DPPH test, the aqueous extract exhibited high scavenging activity with IC50=41.61 \pm 0.98° µg/ mL compared to other extracts. Concerning the ABTS test, high scavenging activity is observed in the crude extract and the EtOAc extract for the TAC assay test with IC50 = 21.11 \pm 2.84^{a,b} µg/ mL and 14.89 \pm 0.26^h µgEq AA/mg DE respectively. These values can be explained by the richness of polyphenols and flavonoids contents in the extracts of *Vaccinium secundiflorum*.

Keywords: Vaccinium, antioxidants, flavonoids, polyphenols, flavonoids, Madagascar

Figure 1. Vaccinium secundiflorum plant

OP. 7.12.

Ultrasound-assisted extraction to isolate target compounds from Artemisia Species

Marius Vasile Bardan^a, Alexandra-Mariana Ionescu^a, Bianca Cezara Stefan^a, Andreea Veronica BOTEZATU ^{A*}, Bianca FURDUI ^A, Anna Busuioc^a, Camelia Bratu^b, Costel Vînătoru^b, Rodica-Mihaela Dinică^{a,*}

^a "Dunărea de Jos" University, Faculty of Sciences and Environment, Galați, Domnească street, 111, 800201 Galați, România

^b Genetic and Vegetal Resources Bank (GVRB), Nicolae Balcescu Street, 56, Buzau, Romania * Corresponding author: <u>rodica.dinica@ugal.ro</u>, <u>andreea.botezatu@ugal.ro</u>

Abstract

Artemisia sp. has been used for a long time for therapeutic purposes, but in particular to treat malaria [1]. Several studies were carried out on different species of plants adapted to cultivation in new areas [2]. An ultrasound-assisted extraction method was used to extract secondary metabolites from *Artemisia annua* and *Artemisia ludoviciana*, provided by the Genetic and Vegetal Resources Bank (GVRB) Buzau, Romania. The plant material was dried, ground into powders and then subjected to extraction. Hexane was used as the extraction solvent in the UAE and several solvents and mixtures were further used for fractionation. UAE proved to be an optimal extraction method, saving time and solvents compared to classical extractions. The results show that both studied *Artemisia* species have a high artemisinin content, in accordance with other similar studies. The results of these methods suggest that the studied plants could serve as a source of natural compounds, with important pharmacological properties such as antimalarial, anti-inflammatory, antioxidant, and antimicrobial.

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OP. 7.13.

Jatropha multifida L. used in Benin pharmacopoeia as an antioxidant, antiinflammatory and antimicrobial agent

Durand Dah-Nouvlessounon^{a,d}, Michaelle Chokki^{b,c,}, Andreea-Veronica Botezatu^d, Maria Ionica Mihaila^d, Martial Nounagnon^a, Baba-Moussa Farid^c, Ramona Suharoschi^b, Lamine Baba-Moussa^a, Rodica Mihaela Dinica^d

^a" University of Abomey-Calavi, Faculty of Sciences and Techniques, Department of Biochemistry and Cell Biology, Laboratory of Biology and Molecular Typing in Microbiology, 05BP1604 Cotonou, Benin

^b" University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Faculty of Food Science and Technology, 3-5 Calea Manastur Street Cluj-Napoca, Romania.

^c" Laboratoire de Microbiologie et de Technologie Alimentaire, FAST, Université d'Abomey-Calavi, 01BP: 526 ISBA-Champ de foire, Cotonou Bénin.

d" Dunarea de Jos" University of Galati, Department of Chemistry, Physics and Environment, 47 Domneasca Street, 800008, Galati, Romania.

* Corresponding author: <u>dahdurand@gmail.com</u>, <u>rodica.dinica@ugal.ro</u>

Abstract

Jatropha multifida L a plant from the Euphorbiaceae family, is commonly used in Benin's traditional medicine due to its therapeutic benefits. This study aims to explore the medicinal efficacy of Jatropha multifida L. by evaluating its various biological activities. An initial phytochemical analysis was conducted, following which the polyphenols and flavonoids were quantified and identified using LC-MS-ESI. The antimicrobial efficacy of the extracts was tested using agar diffusion. Their antioxidant capacity was assessed using several methods: DPPH radical reduction, ABTS radical cation reduction, ferric ion (FRAP) reduction, and lipid peroxidation (LPO). Anti-inflammatory activity was determined based on the inhibition of protein (specifically albumin) denaturation. The study identified several phenolic and flavonoid compounds, including 2-Hydroxybenzoic acid, o-Coumaroylquinic acid, Apigenin-apiosylglucoside, Luteolin-galactoside, and others. Notably, the extracts of *J. multifida* demonstrated bactericidal effects against a range of pathogens, with Concentration Minimally Bactericidal (CMB) values ranging from 22.67 mg/mL (for organisms like S. aureus and C. albicans) to 47.61 mg/mL (for *E. coli*). Among the extracts, the ethanolic variant displayed the most potent DPPH radical scavenging activity with an IC50 value of 0.72±0.03 mg/mL. In contrast, the methanolic extract was superior in ferric ion reduction, registering $46.23 \pm 1.10 \mu gEAA/g$. Interestingly, the water-ethanolic extract surpassed others in the ABTS reduction method with a score of 0.49±0.11 mol ET/g and also showcased the highest albumin denaturation inhibition rate of 97.31±0.35% at a concentration of 1000µg/mL. In conclusion, the extracts of *Jatropha multifida* L. are enriched with bioactive compounds that exhibit significant biological activities, underscoring their therapeutic potential.

Keywords: Plant extract, phytochemical screening, biological activities, Benin.

OP. 7.14.

Valorization of the essential oil of *Tetraclinis articulata* (Vahl) Masters as antioxidant and antibacterial agents, and their incorporation into gummy candies

Fatima Zahra Sadiki ^{a,*}, Corina Neagu^b, Geta Carac^c, Andreea Veronica Botezatu^c, Bene Kouadio^d, Mohammed Sbiti^e, Mostafa El Idrissi^a, Ali Amechrouq^a, Rodica Mihaela Dinica^{c,*}

^{a"} Department of Chemistry, Faculty of Sciences of Meknes, Moulay Ismail University, Bp. 11201, Zitoune, Meknès, Morocco

b" Faculty of Food Science and Engineering, "Dunărea de Jos" University of Galati, 111 Domnească Street, 800201 Galati, Romania

^c" Department of Chemistry, Physics and Environment, "Dunărea de Jos" University of Galati, 111 Domnească Street, 800201 Galati, Romania

d" Faculty Of Natural Sciences, Nangui Abrogoua University, Abidjan, Ivory Coast

e" Faculty of Medicine and Pharmacy of Fez, Fez, Morocco

* Corresponding author: <u>fatizahrasad@gmail.com</u>, <u>rodica.dinica@ugal.ro</u>

Abstract

Numerous novel medications derived from secondary metabolites of plants have been employed in the treatment and prevention of various diseases. Essential oils and plant extracts are widely used as antibiotics to address infectious diseases caused by bacterial contamination, and they are also utilized as antioxidants to tackle neurodegenerative disorders. The development of new food products incorporating natural ingredients rich in antioxidants has emerged as an intriguing marketing strategy for the industry, particularly for products seeking to emphasize health benefits, such as confectionery items like gummy candies. Thus, the aims of this study were to analyze the chemical compositions and assess the antioxidant and antimicrobial activities of *Tetraclinis articulata* essential oil and Jelly candies manufactured using this plant's essential oil. Essential oils were extracted via hydrodistillation using a Clevenger-type apparatus, and their chemical composition was determined through GC-FID and GC-MS. The gummy candies formula comprised sugar, glucose syrup, water, citric acid, agar, and essential oil. The essential oil's ability to inhibit microorganisms was tested using three different methods: disc diffusion, liquid macrodilution, and solid-state dilution. The antimicrobial activity results varied depending on the strain. Colorimetric evaluation of the antioxidant activity of essential oils and gummy candies was conducted using the DPPH and ABTS methods. The antioxidant test results indicate that both the essential oil and Jemmy Candies exhibit significant antioxidant power. These findings suggest that T. articulata essential oil can be regarded as a therapeutic tool in the healthcare and agri-food industries.

Keywords: Tetraclinis articulata (Vahl) Masters, gummy candies, DPPH, ABTS.

OP. 7.15.

Biomolecules as a drug candidate for the solution to the problems caused by microorganisms

B.D.M. Gallo Mongo^{a,b*}, B.F.Mavouba^b, G.S.A.Amboyi^a, B.Mboungou-bouesse^b, S.Ngouomo^b, Tsiba Gouollaly^b, Maria Ionica Mihaila^c, Andreea Veronica Botezatu^c, T. Andzi Barhé ^a, Rodica Mihaela Dinica^c

^a Laboratoire de Recherche en Chimie Appliquée (LARCA), Ecole Normale Supérieure(ENS), Département des Sciences Exactes, Université Marien Ngouabi, Brazzaville

^b Institut national de Recherche en Sciences de la Santé (IRSSA), Département de la Pharmacopée et Médecine Traditionnelle, Laboratoire de Chimie des Biomolécules organiques et de Pharmacodynamie. Cité Scientifique (Ex-ORSTOM), Brazzaville, Congo

^c "Dunărea de Jos" University, Faculty of Sciences and Environment, Galați, Domnească street, 111, 800201 Galați, România

* Corresponding author: <u>bevelg12@gmail.com</u>, <u>rodica.dinica@ugal.ro</u>

Abstract

Microorganisms are responsible for many microbial diseases. The resistance of certain strains to modern drugs leads to the search for new molecules to fight against these pathogenic microorganisms. To this end, researchers are increasingly using medicinal plants for the synthesis of active biomolecules. Hence the interest of our work on the valorization of medicinal plants with bioactive properties. *Methods:* The extract is obtained after maceration in the hydroethanolic solvent (v/v) of the leaf powder. Characterization, separation, isolation and purification were performed using chromatographic and spectroscopic methods. The microorganism tests were evaluated by the agar diffusion technique against the different strains. The minimum inhibitory (MIC) and minimum bacterial (BMC) concentrations were determined by the solid dilution method. The results showed that the microbial strains used are very sensitive to different fractions and their effects are more bactericidal than bacteriostatic and fungal. In conclusion, all these results constitute a scientific justification for the use of these plants in traditional pharmacopoeia in the treatment of infectious diseases and confirm once again the relevance of traditional remedies.

Keywords: Chemical characterization, microorganism, hydroethanolic extract

OP. 7.16.

Formulation of antiseptic soap based on a hydroethanolic extract of *Pteleopsis* suberosa leaves, a plant used in Benin to treat skin infections

Koudoro Yaya Alain^a*, Daye Efloric Raphaël^a, Botezatu Andreea Veronica^b, Olaye Théophile^a, Anna Busuioc^b, Agbangnan Dossa Cokou Pascal^a, Avlessi Félicien^a, Sohounhloué C. K Dominique^a, Maria Ionica Mihaila^b, Dinica Rodica Mihaela^b

^a "University of Abomey-Calavi, Polytechnic School of Abomey-Calavi, Cotonou, Benin ^b "Dunărea de Jos" University of Galati, Faculty of Science and Environment, 47 Domnească Street, RO-800008, Galati, Romania

*Corresponding author: <u>Rodica.Dinica@ugal.ro</u>

Abstract

Skin infections are a real public health problem. The high rate of this condition is due to the resistance of certain microorganisms to the synthetic products used for its treatment. The present study aims to valorize *Pteleopsis suberosa*, a plant used in traditional medicine in Benin to treat skin conditions. Secondary metabolites were identified through specific colouration and precipitation reactions for each family of metabolites. Total phenols and total flavonoids were quantified respectively using the Folin Ciocalteu reagent method and aluminum chloride with a spectrophotometer. The antiradical activity was assessed using the DPPH method. Antiseptic

soap was formulated through the cold saponification process. The physicochemical parameters of the formulated soap such as pH, melting point, free caustic alkali, and foaming power were determined. The antibacterial activity of the soap was evaluated using the dilution method in microplates and Petri dishes. From the results obtained, it is noted that there are several secondary metabolites present in the leaves of *Pteleopsis suberosa* with a high content of phenolic compounds. The hydroethanolic extract of this plant showed more interesting antiradical activity than BHA. Regarding the formulated soap, its pH is 10.2 with a melting point of 175°C, a caustic alkali content of 0.02%, and a foaming power of 50% in saline medium. As for the antibacterial activity, it appears that the hydroethanolic extract of *Pteleopsis suberosa* and the formulated soap have bactericidal activity against *Staphylococcus epidermidis* and *Staphylococcus aureus* strains at a concentration of 10 mg/mL.

Keywords: Plant, extract, secondary metabolites, antiseptic soap, activities

OP. 7.17.

Pharmacological property of *Combretum racemosum* P. Beauv. leaf and root extracts Used in Benin Michaelle Chokki ^{b,c,d}, Cyrille Vodounon^c, Durand Dah-Nouvlessounon^a, Sina Haziz^a, Maria Ionică Mihăilă^d, Rodica Mihaela Dinica^d, Lamine Baba-Moussa^a, Farid Baba-Moussa^b

 ^a Laboratory of Biology and Molecular Typing in Microbiology, Department of Biochemistry and Cell Biology, Faculty of Sciences and Techniques, University of Abomey-Calavi, Cotonou 05BP1604, Benin ;
^b Laboratory of Microbiology and Food Technology, FAST, University of Abomey-Calavi, 01BP : 526 ISBA-Champ de Foire, Cotonou 01BP526, Benin ;

^c National University of Science, Technology, Engineering and Mathematics; ^d Department of Chemistry, Physics and Environment, "Dunarea de Jos" University of Galati, 47 Domneasca Street, 800008 Galati, Romania;

*Corresponding author: <u>michaellechokki@gmail.com</u>, <u>rodica.dinica@ugal.ro</u>

Abstract

This study presents the pharmacological properties of *Combretum racemosum* P. Beauv. leaf and Root Extracts Used in Benin. *Combretum racemosum*, a plant from the Combretaceae family, is traditionally used in Benin for various health problems. However, scientific research on Beninese samples of this plant is limited. This study aimed to identify and assess the bioactive compounds in the plant's leaves and roots. Initial screening involved analyzing powders derived from these parts for total polyphenols, flavonoids, and both condensed and hydrolyzable tannins. The polyphenolic compounds were analyzed using HPLC-DAD-ESI-MS. To evaluate the plant's antimicrobial properties, the agar diffusion method was employed, while FRAP and DPPH assays were used to determine its antioxidant capacity. The analysis revealed the presence of significant polyphenolic compounds in both the leaf and root extracts of *C. racemosum*. Notably, compounds like Pedunculagin, Vescalagin, Casuarictin, and Digalloyl-glucoside were abundant in the leaves, with Vescalagin being especially predominant in the roots. The study also found that the dichloromethane extracts from the leaves and roots exhibited bactericidal effects on a substantial percentage of meat-isolated strains. Moreover, the antioxidant activities of these extracts were confirmed through FRAP and DPPH methods. These findings highlight the potential of C. racemosum leaves and roots as sources of compounds with diverse and significant biological activities. In conclusion, *C. racemosum*'s leaves and roots exhibit promising biological activities, highlighting their potential medicinal value.

Keywords: polyphenol compound; biological activities; plant extract

OP. 7.18.

Phytochemistry and analgesic activities of the methanolic extract of the trunk bark of *Daniellia oliveri* (Fabaceae- Caesalpinoideae), a plant used in traditional medicine in West Africa

Mariam Traore^a, Adjaratou Coulibaly^a, Esther W. L. M. B. Kabre^a, Martin Kiendrebeogo^a, Richard W. Sawadogo^{a,b}, Andreea Veronica Botezatu^c, Maria Ionica Mihaila^c, Rodica Mihaela Dinica^c

- ^a Laboratory of Biochemistry and Applied Chemistry (LABIOCA), Joseph KI/ZERBO University, 03 BP 848 Ouagadougou 03, Burkina Faso.
 - ^b Institute for Research in Health Sciences (IRSS/CNRST), 03 BP 7192 Ouagadougou 03, Burkina Faso ^c "Dunărea de Jos" University, Faculty of Sciences and Environment, Galați, Domnească street, 111, 800201 Galați, România

*Corresponding author: <u>mariamdenenatraore@gmail.com</u>, <u>rodica.dinica@ugal.ro</u>

Abstract

In the ongoing quest for data that can be used for the development of new antioxidant and analgesic molecules, medicinal plants are an invaluable source of scientific research. The objective of this study was to evaluate the phytochemical and analgesic activities of the methanolic extract of the trunk bark of *Daniellia oliveri* (Fabaceae-Caesalpinoideae). *Materials and methods:* Methanolic extract from trunk bark was used. Tube assays were used for the characterization of different phytochemicals. The analgesic effect of the extracts was evaluated following the acetic acid analgesic test in animals. *Result:* Phytochemical screening revealed the



presence of flavonoids, tannins, saponosides, anthocyanosides, reducing sugars, triterpenes and sterols. The analgesic effect of the extracts at doses of 50, 100, 200 and 400 mg/kg reduced abdominal contortions in mice significantly (p<0.05) and dosedependent (Figure 1). These results provide a scientific basis for the search for new molecules. **Keywords**: *Daniellia oliveri*, antioxidant, analgesic, medicinal plant

Figure 1. The analgesic effect of the extracts

OP. 7.19.

Ethnobotanical study of medicinal plants used for viral hepatitis treatment in hauts-bassins areas of Burkina Faso

Eliasse Zongo^a, Roland Nâg-Tiero Meda^a, Sami Eric Kam^{a,b}, Benjamin Kouliga Koama^{a,c}, Anna Busuioc^d, Andreea Veronica Botezatu^d, Maria Daniela Mihaila^d, Hermann Yempabou Ouoba^a, Georges Anicet Ouedraogo^a, Rodica Mihaela Dinica^d

^a Laboratoire de Recherche et d'Enseignement en Santé et Biotechnologies Animales, Université Nazi BONI, 01 BP 1091 Bobo-Dioulasso 01, Burkina Faso.

^b Laboratoire de recherche en Bactériologie, INSP/ Centre MURAZ, 01 BP 390 BoboDioulasso 01, Burkina Faso

^c Laboratoire de médicine et pharmacopée traditionnelle, Institut de Recherche en Sciences de la Santé, Direction Régionale de l'Ouest, 01 BP 545 Bobo-Dioulasso 01, Burkina Faso

^d Department of Chemistry, Physics and Environment, Faculty of Sciences and Environment, "Dunărea de Jos" University of Galati, 111 Domnească Street, 800201 Galati, Romania

* Corresponding author: zongoeliasse@gmail.com, rodica.dinica@ugal.ro

Abstract

Viral etiologies remain a major concern in sub-Saharan Africa. In Burkina Faso, the majority of the population uses medicinal plants to treat hepatitis. The present study consisted of listing the medicinal plants used in the traditional treatment of hepatitis in the Hauts-Bassins region of Burkina Faso. A field study was carried out from August 2018 to July 2019 with one hundred and forty-four traditional healers and herbalists, including 94 men and 50 women. The survey was carried out using a semi-structured questionnaire. Fifty-four plant species have been listed in 51 genera and 31 families. The most frequently mentioned families were; Fabaceae (6 species) followed by Combretaceae, Rubiaceae, Meliaceae and Anacardiaceae (4 species for each). All other families were represented by a single species. The most commonly used species were: *Terminalia avicennioides* Guill. and Perr (10.22%) followed by *Cassia sieberiana* DC, *Chrysanthellum americanum* (L.) Vatke and *Combretum micranthum* G. Don(6.20% for each). The leaves (41.89%) and roots (37, 43%) were the most used organs. The decoction was the most common method of preparation (53.49%). Drinks (88.11%) were the most widely used mode of administration. This study is a contribution to a better knowledge of the medicinal plants used to manage viral hepatitis in the Hauts-Bassins region of Burkina Faso.

Keywords: Ethnobotanical survey, Traditional healers, herbalists, viral hepatitis, Hauts-Bassins, Burkina Faso.

OP. 7.20.

Antioxidant and anti-inflammatory capacity of *Terminalia avicennioides* used in the traditional treatment of hepatitis in the Hauts-bassins region of Burkina Faso

Eliasse Zongo^a, Roland Nâg-Tiero Meda^a, Anna Busuioc^b, Andreea Veronica Botezatu^b, Maria Daniela Mihaila^b, Franck Le Sage Somda^a, Georges Anicet Ouedraogo^a, Rodica Mihaela Dinica^b

^a Laboratoire de Recherche et d'Enseignement en Santé et Biotechnologies Animales, Université Nazi BONI, Bobo Dioulasso 01 BP 1091, Burkina Faso

^b Department of Chemistry, Physics and Environment, Faculty of Sciences and Environment, "Dunărea de Jos" University of Galati, 111 Domnească Street, 800201 Galati, Romania *Corresponding author: <u>zongoeliasse@gmail.com</u>, <u>rodica.dinica@ugal.ro</u>

Abstract

Terminalia avicennioides is widely used in the Hauts-Bassins region for the traditional treatment of hepatitis. The objective of this study was to evaluate the antioxidant and anti-inflammatory activities of *Terminalia avicennioides* extracts. The antioxidant activities were examined by the
DPPH (2,2-diphenyl-1-picrylhydrazyl), ABTS (2,2'-azinobis-(3 ethylbenzthiazoline-6-sulfonic acid) and TAC (total antioxidant capacity) method. Anti-inflammatory was estimated by the lipoxygenase inhibition, protease inhibition and red blood cell membrane stabilization test. The extract of the bark presented the best capacity for trapping DPPH free radicals (IC50 = 16.32 ± 0.18 μ g/mL) on the other hand the extract of the roots presented the best total antioxidant capacity $(TAC = 23.75 \pm 1.23 \text{ mg AA/g of extract})$ and the best capacity for trapping ABTS⁺⁺ cationic radicals $(IC_{50} = 5.66 \pm 0.83 \,\mu g/mL)$. At the same time, the extract of the leaves had the strongest inhibitory capacity for lipoxygenase (IC₅₀ = $9.08 \pm 1.44 \,\mu$ g/mL) and proteases (IC₅₀ = $71.96 \pm 1.18 \,\mu$ g/mL). On the other hand, the extract of the roots presented the best stabilizing capacity of the red blood cell membrane ($IC_{50} = 51.29 \pm 1.26 \mu g/mL$). The bark was rich in polyphenol (39.99±1.26 mg AGE/100 mg of extract) and in tannins (9.04±0.55 mg ATE/100 mg of extract), however the roots were rich in polyphenol $(39.70\pm0.99 \text{ mg EAG}/100 \text{ mg of extract})$, flavonoids $(4.90\pm0.20 \text{ mg OE}/100 \text{ mg of})$ extract) and vitamin C (24.16±3.86 mg AA/g). Polyphenols, flavonoids, tannins and vitamin C could contribute to the antioxidant and anti-inflammatory capacity of *Terminalia avicennioides* extracts. These results could justify the use of Terminalia avicennioides in the traditional management of hepatitis in the Hauts-Bassins region.

Keywords: antioxidant, anti-inflammatory, Hauts-Bassins region, *Terminalia avicennioides*.

OP. 7.21.

Electrochemical biosensors: specific analytical detection of melatonin

Andra-Georgiana Trifan, Constantin Apetrei*

"Dunărea de Jos" University of Galati, Faculty of Science and Environment, 111 Domnească Street, RO-800008, Galati, Romania * Corresponding author: <u>Constantin.Apetrei@ugal.ro</u>

Abstract

Electrochemical biosensors play a crucial role in detecting and quantifying compounds by measuring electrical property changes due to electrochemical reactions. Operating on redox reaction principles, these biosensors consist of receptors and transducers converting chemical data into measurable energy. Biosensors integrate biological receptors, (e.g. DNA, enzymes or antibodies) with physicochemical transducers, enabling the detection and measurement of targeted compounds across diverse sample matrices. Biosensors have found widespread applications in various fields including healthcare, environmental monitoring, food safety, and biodefense. These devices are designed to provide rapid, sensitive, and selective detection of analytes ranging from small molecules to macromolecules, such as proteins and nucleic acids. Melatonin detection is of crucial importance in the study of the circadian cycle and the electrochemical biosensors can be used in real time analysis.

Keywords: sensor, biosensor, sensibility, selectivity, bioreceptor.

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OP. 7.22. Electrochemical sensors for non-steroidal anti-inflammatory drugs detection

Ana-Raluca Măghinici, Constantin Apetrei*

"Dunărea de Jos" University of Galati, Faculty of Sciences and Environment, 111 Domnească Street, RO-800008, Galati, Romania *Corresponding author: <u>Constantin.Apetrei@ugal.ro</u>

Abstract

The Over-the-counter drugs, known as non-steroidal anti-inflammatory drugs (NSAIDs), are commonly used to manage fever, alleviate pain, and reduce inflammation. The detection and monitoring of NSAIDs in pharmaceuticals and biological samples is of major importance due to their widespread use and potential side effects. Screen printed electrochemical sensors have emerged as promising tools for NSAIDs detection, offering advantages such as high sensitivity, selectivity, inexpensive instruments and rapid response times. Recent advancements in electrochemical sensor technologies specifically tailored for NSAIDs detection are highlighted. We explore the principles of electrochemical detection methods, focusing on voltammetry and its applications in identifying various NSAIDs compounds. Furthermore, we explore the challenges and opportunities in sensor design, material selection, and signal processing techniques to enhance the performance and reliability of electrochemical sensors for NSAIDs detection. **Keywords**: NSAID, voltammetry, screen printed electrochemical sensors, selectivity

OP. 7.23.

Evaluation HPLC profile, antioxidant, Quorum sensing, Biofilm and Swarming motility and enzyme inhibition activities of conventional and green extracts of Salvia triloba

Alfred Ngenge Tamfu^a, Mohammed Mansour Quradha^b, Selcuk Kucukaydin^c, Mehmet Emin Duru^d, Mudassar Iqbal^e, Abdulkader Moqbel Farhan Qahtan^a, Rasool Khan^f and Ozgur Ceylan^g

^a College of education, Seiyun University, Seiyun, Yemen

^b Department of Chemical Engineering, School of Chemical Engineering and Mineral Industries, University of Ngaoundere, 454, Ngaoundere, Cameroon

^c Department of Medical Services and Techniques, Koycegiz Vocational School of Health Services, Mugla Sıtkı Kocman University, Koycegiz/ Mugla, Turkey

^d Department of Chemistry, Faculty of Science, Mugla Sitki Kocman University, Mugla 48000, Turkey ^e Department of Agricultural Chemistry and Biochemistry, The University of Agriculture Peshawar, 25000, Pakistan

^fInstitute of Chemical Sciences, University of Peshawar, Peshawar-25120, Pakistan ^gFood Quality Control and Analysis Program, Ula Ali Kocman Vocational School, Mugla Sitki Kocman University, Ula Mugla 48147, Turkey

*Corresponding author: <u>macntamfu@yahoo.co.uk</u>

Abstract

The current study aims to preparation of green extract as the new method and, methanolic, and ultrasonic extracts of *S. triloba*, and compared their phenolic composition utilizing HPLC-DAD, antibacterial, antioxidant, and enzyme inhibition activities. The HPLC-DAD analysis revealed that Rosmarinic acid found in high amount in the methanolic, ultrasonic and green extracts with quantities as 169.7 ± 0.51 mg/g, 135.1 ± 0.40 mg/g and 28.58 ± 0.46 mg/g respectively. The Transcinnamic acid was found only in ultrasonic extract with quantitated as 4.40 ± 0.09 mg/g. The green extraction exhibited better biofilm inhibition than methanolic and ultrasonic extracts on of *E. faecalis*, while methanolic outperformed ultrasonic-assisted and green extract against *S. aureus*

and *E. coli* strains at MIC concentration. Methanolic and green extract exhibited considerable Quorum sensing inhibition against *C. violaceum* CV026, while no activity recorded by ultrasonic-assisted extract. The methanol and ultrasonic-assisted extracts of *S. triloba* recorded moderate BChE inhibition, each extracts tested demonstrated limited inhibitory effects on the Urease enzyme. Likewise methanolic, ultrasonic-assisted and green extracts of *S. triloba* demonstrated significant antioxidant activity, however the highest activity exhibited by methanolic extract as β -carotene-linoleic acid assay(IC₅₀=10.29±0.36 µg/mL), DPPH• assay (IC₅₀=27.77±0.55 µg/mL), ABTS•+ assay (IC₅₀=15.49±0.95 µg/mL), Metal chelating assay,(IC₅₀=57.80±0.95 µg/mL), CUPRAC assay A_{0.50}=32.54±0.84 µg/mL, furthermore the methanolic extract exhibited antioxidant activity better than stander used (α -tocopherol). The current study is the first time demonstrated ability of green solvent as friendly solvent to extract phenolic compounds from *S. triloba* and evaluated their biological activities

Keywords: *Salvia triloba*, phenolic composition, antioxidant, enzyme inhibition, antibiofilm, quorum-sensing

OP. 7.24.

Phytochemical analysis of phytomedicines used to treat erectile dysfunction in Côte d'Ivoire

Amani Kadja^{*}a, Konan Dibi Jacques^a, Atsain Marie Rosine épouse Allangba^a N'Dri Théotime Woukami Junior^a, Rodica Mihaela Dinica^b, Békro Yves-Alain^a

^aLaboratoire de Chimie Bio-Organique et de Substances Naturelles / UFR-SFA / Université Nangui Abrogoua, 02 BP 801 Abidjan 02

^b"Dunarea de Jos" University of Galati, Department of Chemistry, Physics and Environment, 47 Domneasca Street, Galati 800081, Romania

* Corresponding author: <u>kadjamanib@yahoo.fr</u>

Abstract

The problem of erectile dysfunction is widespread throughout the world and has a negative impact on a couple's quality of life [1]. As a result, many medical and psychological resources are available to sufferers of erectile dysfunction, and most find that their condition is rapidly resolved. The advent of Viagra in 1998 also revolutionized the treatment of erectile dysfunction [2]. However, because of its high cost and numerous side effects (chest pain, sudden reduction or loss of vision, difficulty breathing or dizziness, swollen eyelids, etc.), some people resort to traditional medicine. These phytomedicines have been developed in Africa, mainly in Côte d'Ivoire, sometimes without regular control. The aim of this study is to carry out a quality control of these drugs. Three phytomedicines used to treat erectile dysfunction, including one sold in pharmacies, were selected. Phytochemical analyses revealed that one of these, prized by some of the Ivorian population, contained synthetic products such as sildenafil.

Key words: phytomedicines, spectroscopy, sildenafil

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OP. 7.25.

Evaluation of the effects of Juniperus essential oils in reducing selected cigarette smoke toxicants and improvement of *in vivo* oxidative parameters

Haouaouchi Fatma Zohra^{a, b}, Baya Berka^c, Boudiba Sameh^a, Boudiba Louiza^a, Karima Hanini^a, Gasmi Salim^a, Soraya Hioun^a, Alfred Ngenge Tamfu^{d*}

^a Laboratory of applied chemistry and renewable energies (LACRE), Echahid Cheikh Larbi Tebessi University, Constantine road, 12002, Tebessa-Algeria

^b Laboratory of organic materials and heterochemistry (LOMH), Echahid Cheikh Larbi Tebessi University, Constantine road, 12002, Tebessa-Algeria

^c Laboratory of Bioactive Products and Biomass Valorization Research, Higher Teacher Training School of Kouba, Vieux Kouba, BP 92, Algeria

^d Department of Chemical Engineering, School of Chemical Engineering and Mineral Industries, University of Ngaoundere, 454 Ngaoundere-Cameroon

* Corresponding author: macntamfu@yahoo.co.uk

Abstract

This study investigates the potential of juniper essential oils (EOs), particularly from the berries of Juniperus oxycedrus (JOX) and Juniperus phoenicea L. (JPH), to mitigate the harmful effects of cigarette smoke. Significant reductions in potentially harmful substances, like nicotine, are revealed by in vitro assessments. The berry essential oil (EO) of J. oxycedrus L. and J. phoenicea showed good inhibition activity for nicotine, with IC₅₀ values of 16.78 \pm 1.04 µg/mL and 18.40 \pm 0.46 µg/mL, respectively. Moreover, *Juniperus oxycedrus* essential oil (JOX-EO) was shown to be the most effective in lowering the amount of tar. Among the three tar fractions, JOX berry essential oil had the greatest percentage of basic tar inhibition (64.45%), followed by neutral tar (53.23%), and acidic (25.15%). Furthermore, the evaluated JOX-EO demonstrated efficacy in inhibiting polycyclic aromatic hydrocarbons (PAHs). In vivo experiments on chronically exposed rats to cigarette smoke reveal promising results regarding oxidative stress markers. The administration of JOX essential oil at 200 mg/kg for 15 days post-smoking cessation shows significant improvements in hematological variables (red blood cells (RBC), platelets (PLT), hemoglobin (HB), hematocrit (HCT), and mean corpuscular volume (MCV)). and oxidative stress markers (glutathione (GSH), malondialdehyde (MDA), glutathione-S-transferase (GST), glutathione peroxidase (GPx), and catalase (CAT)), compared to JPH essential oil, indicating their powerful antioxidant properties, and specifically, JOX-EO demonstrates a remarkable capacity to expedite the recovery of the body from the lingering effects of smoking, surpassing the effects observed with JPH essential oil.

Keywords: Cigarette smoke, toxicants, oxidative stress, *Juniperus oxycedrus, Juniperus phoenicea* L., *in vivo* oxidative parameters.

OP. 7.26.

Effect of drying and cooking methods on the phytochemical profile and antioxidant activity of *Corchorus olitorius* (kplala) leaves from central Côte d'Ivoire

Harouna Diete Souleymane^a, Kouakou N'goran David Vincent^a, Soro Yaya^a; Rodica Mihaela Dinica ^b

^a Joint research and innovation unit in agronomic sciences and transformation processes, Félix Houphouët-Boigny National Polytechnic Institute (INP-HB), B.P. 1093 Yamoussoukro, Ivory Coast;

<u>david.kouakou@inphb.ci; yaya.soro@inphb.ci</u> *Corresponding author: <u>diete35261@gmail.com</u>

Abstract

Corchorus olitorius is a traditional African leafy vegetable of the Malvaceae family, used in many countries for its nutritional and pharmacological properties. In Côte d'Ivoire, however, it is mainly

consumed by the population as a sauce. In order to assess the effect of cooking on its phytochemical profile, snowball sampling was carried out to identify the population's traditional techniques. The phytochemical profile and DPPH antioxidant activity of the prepared sauces were then determined in the same way as for the raw leaves. The study showed that 83.33% of the population used 100 g of fresh kplala leaves to cook in 330 mL of water. To prepare the kplala sauce, 50% of the population left the leaves to cook for 15 minutes; 28.57% for 30 minutes and 21.43% for 45 minutes after the water began to boil (~100°C) over a low heat. After phytochemical analysis, drying had a positive impact on the content of total flavonoids, total tannins and antioxidant activity by DPPH, with a significant difference (P<0.05). Cooking slightly altered phyto-constituent content after 15 and 30 minutes of cooking (P<0.05).

Keywords: Effect of cooking, phytochemical profile, antioxidant activity, *Corchorus olitorius* and Côte d'Ivoire.

OP.7.27.

Phytochemical Analysis, Antioxidant and anti-enzymatic activities of Aqueous and Hydroethanolic Extracts of *Anastatica hierochuntica* L. (Brassicaceae)

Wendkouni Leila Marie Esther Belem-Kabré ^{a,b*}, Blondine Saïdath Odjo ^a, Mathieu Nitiéma^a, Maman Noura Oumarou^a, Boubacar Yaro^a, Rodica Mihaela Dinica^b, Elie Kabré^c, Noufou Ouédraogo^a

^{a"} Health Sciences Research Institute (IRSS/CNRST), 03 BP 7047, Ouagadougou 03, Burkina Faso ^{b"} Dunărea de Jos" University of Galati, Faculty of Science and Environment, 47 Domnească Street, RO-800008, Galati, Romania

c" National Agency for Health Safety of the Environment, Food, Work and Health Products (ANSSEAT), Ouagadougou, Burkina Faso

* Corresponding author: rodica.dinica@ugal.ro

Abstract

Anastatica hierochuntica L. (Brassicaceae) has been claimed to treat various conditions, including complicated childbirth. The principal objective of this research was to investigate on phytochemical and pharmacological effects of the aqueous and hydroethanolic extracts of the whole plant from *A. hierochuntica*. Qualitative and quantitative methods helped identify and quantify the phytoconstituents in both extracts. The antioxidant activity was studied using four standard methods (ABTS, DPPH, FRAP, and LPO). The inhibitory power of the extracts on pro-inflammatory enzymes such as 15-lipoxygenase and phospholipase A_2 was determined. Steroids, triterpenoids, flavonoids, tannins, coumarins, and reduced compounds were identified in both extracts. The hydroethanolic extract exhibited higher content of hydrolyzable tannins (15.07 ± 0.24 mg tannic acid equivalent/g) than the aqueous decoction (11.8 ± 0.69 mg TAE/g). The extracts demonstrated the ability to scavenge DPPH and ABTS radicals, reduce ferric ions, and inhibit especially lipid peroxidation. No significant difference was noted in the phospholipase inhibition between the extracts and betamethasone. The hydroethanolic extract displayed the most significant anti-lipoxygenase activity with an IC₅₀ value of 55.82 ± 1.15 µg/mL.

Keywords: Anastatica hierochuntica, Phytoconstituents, Antioxidant, Anti-Inflammatory,

III. POSTERS

SECTION 3 PROGRESS IN FOOD SCIENCE AND BIO-RESOURCES ENGINEERING

PP.3.1

Possibility to develop a value-added cake based on carrot pomace powder

Florina-Genica Oncică*, Gabriela Râpeanu, Nicoleta Stănciuc, Iuliana Aprodu, Georgiana Horincar

"Dunărea de Jos" University of Galati, Faculty of Food Science and Engineering, Domnească Street, 111, RO-800201, Galati, Romania *Corresponding author: <u>genicaoncica@gmail.com</u>

Abstract

The carrot (*Daucus carota L*.) is a bright orange vegetable commonly used in cooking and as a healthy snack. The carrot pomace, which is produced during the extraction of juice is an important source of bioactive compounds with multiple health benefits that can be used as dietary fiber, carotenoids, and phenolic compounds, making it a potential bioactive ingredient. This research aimed to assess the feasibility of substituting traditional flour with carrot pomace powder in cake formulations, examining the effects on nutritional content, color, sensory properties, and consumer acceptance. The experimental approach aimed to evaluate the impact on the physical and chemical characteristics of the product and the bioactive characteristics (carotenoid levels) by formulating a cake with varying levels of replacing wheat flour with carrot powder. As expected, the results indicated that increased levels of carrot pomace powder significantly improved the dietary fiber and carotenoid content of the cakes, contributing to an increase in nutritional value. The sensory evaluation revealed a positive acceptability threshold in the case of cakes with substitution up to 6%, thus highlighting an optimal balance between the improved nutritional value and the desired sensory properties. The radical scavenging test indicated a linear increase in the antioxidant capacity of the cakes enriched with carrot pomace, suggesting potential health-promoting properties. This study demonstrates the viable use of carrot pomace powder as a bioactive ingredient in cake production, providing a long-term strategy to capitalize on food processing by-products while simultaneously improving the nutritional profile of bakery products. The study carried out supports the widespread applicability of agro-food by-products in the development of functional foods, aligning with the current trends towards a healthier diet and waste reduction in the food industry.

Keywords: carrot pomace; carotenoids; bioactive compounds; cakes, sensory analysis.

PP. 3.2.

Industrial Hemp (*Cannabis sativa* L.): A Sustainable Alternative to Traditional Sources of Plant Proteins and Lipids

Virginia Tanase Apetroaei*, Eugenia Mihaela Pricop, Daniela Ionela Istrati, Aida Mihaela Vasile, Gabriela Elena Bahrim and Camelia Vizireanu

Faculty of Food Science and Engineering, "Dunarea de Jos" University of Galati, 111 Domnească Street, 800201 Galați, România * Corresponding author: <u>vt219@student.ugal.ro</u>

Abstract

In recent years, soy and wheat were the predominant sources of plant-based proteins, significantly contributing to the total food market. However, among the top eight food allergens, these two sources are increasingly associated with allergic problems. In this context, the consumption of vegan and vegetarian products has significantly increased, and industrial hemp (Cannabis sativa L.) has emerged as an attractive and sustainable alternative, sparking global interest in expanding its applications across various industries, especially in the food sector. Therefore, this review investigates industrial hemp seeds' physicochemical and functional attributes (Cannabis sativa L.), highlighting their potential for integration into food products. The objective is to transform conventional foods into added-value variants, thus offering additional health benefits. The analysis explores opportunities for innovation in creating nutritious and sustainable food products by incorporating hemp seeds (*Cannabis sativa* L.) into food processing, advocating for a balanced and environmentally friendly diet. Despite its numerous advantages, industrial hemp requires further investigation regarding nutritional and technological aspects. Recent studies have highlighted the importance of this plant in improving dietary profiles and human health, and this article proposes a comprehensive review of the scientific literature in this field.

Keywords: *Cannabis sativa* L.; nutritional components; bioactive compounds; antinutritional compounds; functional foods

PP. 3.3.

Review on Chemical and nutritional composition and technological properties of teff

Boyiza Samson Abebe*, Iuliana Aprodu, Daniela Ionela Istrati, Camelia Vizireanu

Faculty of Food Science and Engineering, Dunărea de Jos University of Galați, 111 Domneasca Street, 800201, Galați, Romania

*Corresponding author: <u>samson.abebe@ugal.ro</u>

Abstract

Teff (*Eragrostis tef*) has attracted worldwide attention for its excellent nutritional profile and versatile uses in food. Understanding its physicochemical properties, nutritional composition and potential applications is important to maximize its benefits in various food industries. This review aims to comprehensively investigate the physicochemical properties, nutritional composition and various food applications of teff. The analysis includes a detailed examination of teff's macronutrients, micronutrients, bioactive compounds and its suitability for gluten-free formulations. Teff is rich in macronutrients, dietary fiber, essential vitamins (including thiamin, riboflavin, niacin, and folate) and minerals (including calcium, iron, and zinc). In addition, it contains bioactive compounds such as phenolic acids and flavonoids, which contribute to its antioxidant properties. Technologically, teff flour shows favorable properties for food processing, including high water absorption capacity and rheological behavior. The effect appears as a promising grain with good physico-chemical properties, nutritional value and versatile food applications. Its gluten-free nature makes it suitable for people with celiac disease or gluten sensitivity. The potential of teff extends to a variety of food products, improving nutritional quality and sensitivity. Continued research into the use of teff in food formulations promises to develop innovative and nutritious options to meet growing consumer needs.

Keywords: *Eragrostis tef,* gluten-free, dietary fibers, phenolic acids, flavonoids, vitamins, minerals.

PP. 3.4.

Extraction of bioactives from carrot pomace powder (*Daucus carota L.*) using ultrasonic-assisted method

Florina-Genica Oncică*, Gabriela Râpeanu, Nicoleta Stănciuc, Iuliana Aprodu, Georgiana Horincar

"Dunărea de Jos" University of Galati, Faculty of Food Science and Engineering, Domnească Street, 111, RO-800201, Galati, Romania *Corresponding author: <u>genicaoncica@gmail.com</u>

Abstract

The quest for sustainable sources of bioactive compounds in the food industry has led to the exploration of agri-food by-products as valuable reservoirs of nutritional and functional ingredients. The carrot (*Dacucus carota L*.) is a root vegetable often exhibiting an orange color, recognized for its abundance of biologically active chemicals (phenolics, carotenoids, β -carotene, dietary fibers, vitamins, and minerals). These compounds have been found to contain notable health-promoting characteristics such as anti-infection, anti-oxidant anti-stress, anti-cancer, and other pharmacological properties. This study focuses on the extraction of bioactive compounds (total carotenoids, polyphenols, antioxidant activity) from carrot pomace powder, a by-product of carrot processing industries. Carrot pomace, rich in fibers, phenolics, flavonoids, and carotenoids, presents a promising opportunity for the recovery of compounds with healthpromoting properties. The primary objective of this research was to establish efficient extraction methodologies and process parameters using ultrasounds to maximize the yield of bioactive compounds from carrot pomace powder. In this regard, the purpose of this study is to evaluate the effect of the ultrasound-assisted extraction method using different solvent types (50%) methanol, 70% ethanol, hexane, acetone, hexane: acetone, 3:1) with various extraction times (30 min and 60 min) able to increase the extraction yields of bioactive compounds, stable polyphenols, and the antioxidant activity (DPPH radical scavenging capacity). The biologically active compounds were analyzed in terms of total phenolic content, total carotenoid content, and DPPH assays. Results showed that the solvent mixture hexane:acetone, 3:1 supernatant possessed significant antioxidant and radical scavenging activities. The maximum extraction yield of total carotenoids (35.72±1.21 mg/100g dw) and antioxidant activity (11.38±0.03 µmol Trolox/g dw) were obtained using hexan: acetone, 3:1, after 30 min of extraction time at 40 kHz, power of 100 W and 30 °C. The extraction method employed for carrot pomace plays a critical role in achieving optimal extraction yields and preserving the bioactives. This, in turn, enhances the potential of carrot pomace as a natural antioxidant in various industries such as food formulations, nutraceuticals, cosmetics, and pharmaceuticals. This research highlights the potential of carrot pomace, a commonly discarded by-product, as a sustainable source of valuable bioactive compounds and contributes to the valorization of food waste.

Keywords: carrot pomace; carotenoids; sonication; extraction; bioactive compounds.

PP. 3.5.

Exploring the potential of hemp seeds (*Cannabis sativa* L.) in food industry: a comprehensive overview

Virginia Tanase Apetroaei*, Eugenia Mihaela Pricop, Daniela Ionela Istrati, Aida Mihaela Vasile, Gabriela Elena Bahrim and Camelia Vizireanu

Faculty of Food Science and Engineering, "Dunarea de Jos" University of Galati, 111 Domnească Street, 800201, Galați, România * Corresponding author: <u>vt219@student.ugal.ro</u>

Abstract

Hemp seeds (*Cannabis sativa* L.) have emerged as a widely used gluten-free alternative in the food industry due to their perfectly balanced lipid profile and complete protein content, offering an exceptional source of nutrients. Due to its antioxidant and anti-inflammatory properties, Hemp seed oil is increasingly seen as a natural dietary supplement with medicinal and nutraceutical potential. At the same time, the easily digestible proteins provide a clear nutritional advantage due to the absence of protease inhibitors, resulting in improved digestibility. Fortifying various food matrices has increased nutritional value, positively affected sensory acceptability, and responded to consumer demand for healthy and sustainable food options. With studies highlighting the beneficial effects of hemp seeds in combating chronic degenerative diseases and improving overall health, companies are increasingly focusing on harnessing the nutritional potential of industrial hemp seeds (*Cannabis sativa* L.) to develop innovative food products. The CANNUSE database serves as a valuable resource for understanding hemp seeds' medical and dietary applications (*Cannabis sativa* L.). Overall, this review highlights the role of hemp seeds in enhancing nutritional quality and diversity in food products, offering promising avenues for future research and product development in the food industry.

Keywords: hemp seeds; lipids; proteins; food industry; functional foods; innovative products

PP. 3.6.

Possibilities of white grapes processing in the presence of carbonic ice

Marius Florin Stoica*, Gabriela Râpeanu, Georgiana Horincar, Nicoleta Stănciuc, Iuliana Aprodu

"Dunărea de Jos" University of Galati, Faculty of Food Science and Engineering, Domnească Street, 111, RO-800201, Galati, Romania *Corresponding author: <u>cartedevinuri@gmail.com</u>

Abstract

In white winemaking the control of temperature is an important process. Grape processing at low temperature is usually applied to the white and rose winemaking to have the wines with specific aromas. In general, having an alcoholic fermentation at lower temperature the major impact will be on the final sensory quality of wine because the loss in volatiles will be minimum. The studies were performed on *Fetească albă* grapes is an autochthonous Romanian variety of white grapes. The main aim of this study was to investigate the impact of using carbonic ice during the pressing of white *Fetească albă* grapes during the vintage of 2023 at *Dealul Bujorului* vineyard to prevent oxidation and preserve wine aromas. The results revealed an improvement of organoleptic and physico-chemical wine characteristics, as well as monitoring the positive evolution of wines over time. These findings pointed out the importance and effectiveness of implementing this technology in white grape winemaking to obtain high quality and sustainable wines. **Keywords:** white grapes; *Vitis vinifera; Fetească albă*; pressing, carbonic ice.

PP. 3.7.

The impact of some pollutants on the hormonal system of aquatic organisms

Diana Moisa (Danilov)^{a,b}, Carmen Chițescu^a, Angelica Docan^a, Iulia Grecu^a, Valentina Coatu^b, Luminita Lazar^b, Andra Oros^b, Nicoleta Damir^b, Elena Ristea^b, Cristian Danilov^b, Lorena Dediu^a

 ^a"Dunărea de Jos" University of Galati, Faculty of Food Science and Engineering, Domneasca Street, 47, RO-800008, Galati, Romania, www.ugal.ro
^bNational Institute for Marine Research and Development "Grigore Antipa", Mamaia Blvd. No. 300, RO-900591, Constanta, Romania, www.rmri.ro*

Corresponding author: ddanilov@alpha.rmri.ro

Abstract

Pollution of the aquatic environment represents the introduction or presence of products or substances obtained because of human activities that have harmful effects on the aquatic ecosystem. Carrying out a literature review on the impact of aquatic pollutants on the hormonal system of aquatic organisms is of particular importance in providing an overview of the current state of research. This poster summarizes the latest research findings to illustrate how some persistent organic pollutants, polycyclic aromatic hydrocarbons, heavy metals, and some emerging pollutants can disrupt the hormonal system of aquatic organisms. Both in vitro and in situ studies are mentioned to highlight the importance and shortcomings of each situation. Laboratory studies offer more precision, allowing isolation of variables such as pollutant concentration and strict monitoring of reproductive effects. They are time and cost effective but may overestimate or underestimate the actual effects in the aquatic ecosystem. In situ studies, although more expensive and difficult to interpret due to external factors, better reflect reality. They allow the assessment of the cumulative effects of pollutants and their interactions with the environment.

Keywords: persistent organic pollutants, aquatic ecosystem, emerging pollutants, heavy metals, polycyclic aromatic hydrocarbons, hormonal system.

PP. 3.8.

Extraction and characterization of bioactive compounds from pumpkin peel powder (*Cucurbita maxima L*.)

Roxana Nicoleta Ratu (Gavril)^{a,b}, Gabriela Râpeanu^a, Florina Stoica^b, Oana Emilia Constantin^a, Nicoleta Stănciuc^a, Iuliana Aprodu^a

a"Dunărea de Jos" University of Galati, Faculty of Food Science and Engineering, Domnească Street, 111, RO-800201, Galati, Romania

^b"Ion Ionescu de la Brad" University of Life Sciences of Iasi, Faculty of Agriculture, Department of Food Technologies, 3 Mihail Sadoveanu Alley, 700489 Iasi, Romania

*Corresponding author: <u>roxana.ratu@gmail.com</u>

Abstract

The burgeoning interest in utilizing agricultural by-products for the extraction of valuable bioactive compounds has led to innovative approaches in food science and technology sector. The consumption of pumpkins, both domestically and industrially, leads to the production of significant quantities of pumpkin by-products. Pumpkin peels are rich in important bioactive components (polyphenols, flavonoids, tocopherols, carotenoids, and terpenoids) with antioxidative, anti-mutagenic, and anti-inflammatory activities.

This study focuses on the extraction and characterization of bioactive compounds from pumpkin peel powder (*Cucurbita maxima L.*), a typically underutilized by-product of pumpkin processing. The purpose of this study was to investigate the effect of microwave-assisted extraction of bioactive compounds from pumpkin peel using different solvent extraction (methanol, hexane,

acetonitrile, acetone, ethanol 70%, hexane: acetone 3:1) and microwave power. The study evaluates the efficiency of different solvents and extraction conditions in maximizing the yield of bioactive compounds. The pumpkin peel extract was evaluated in terms of total carotenoids content (TC), total phenolic compounds (TPC), and antioxidant activity (DPPH). The results showed that the highest yield of antioxidant activity was $14.61\pm0.02 \mu$ Mol of Trolox/g d.w. using methanol as solvent after 45 s of extraction at 345 W microwave power. The maximal carotenoid content was $16.03 \pm 0.31 \text{ mg}/100 \text{ g}$ d.w. using methanol as solvent after 45 s of extraction at a microwave power of 345 W. This research not only highlights the feasibility of extracting valuable bioactive compounds from pumpkin peel powder but also contributes to the sustainable use of food processing by-products supporting the circular economy.

Keywords: carotenoids, pumpkin peel, antioxidant activity, phytochemicals, microwave assisted extraction

PP. 3.9.

Isolation and identification of dominant lactic acid bacteria species from ersho

Samson Abebe[,] Anca Ioana Nicolau, Corina Neagu, Camelia Vizireanu

Faculty of Food Science and Engineering, Dunărea de Jos University of Galați, 111 Domneasca Street, 800201, Galați, Romania Corresponding author: <u>samson.abebe@ugal.ro</u>

Abstract

Teff (*Eragrostis tef*), a gluten-free grain native to Ethiopia, has gained popularity in recent years for its nutritional and health benefits. Lactic acid bacteria (LAB) are known to play an important role in the fermented products based on teff, this is why, in this study, we aimed to isolate and identify the species present in ersho (teff sourdough starter), which is used to obtain a flat bread named injera.

Isolation of LAB species was performed by inoculating MRS agar and incubating it at 37°C for 3 days. Then, 10–15 colonies were picked mainly based on their morphological features, such as size, color, and shape. Subsequently, the picked colonies were re-streaked on a new MRS-agar plate at least one time for colony purification. API 50 CHL strips were used for strain identification. Our results revealed the presence of LAB species identified as Lactobacillus rhamnosus. This strain has probiotic properties that can improve gut health and boost immunity. The identification of Lactobacillus rhamnosus in ersho suggests that it is the dominant LAB in teff's microbiota. Consequently, teff may be a potential source of probiotics that may have important health benefits for consumers. More research is needed to explore the potential probiotic properties of this species and its impact on the nutritional and functional properties of teff. The results of this study can have important implications for the food industry, especially in the development of functional foods and beverages. **Key words**: *Lactobacillus rhamnosus*, teff, injera, starter culture, *API 50 CHL*

PP. 3.10.

Polyphenolic profile characterization of two species of juniper berries (*J. communis* and *J. oxycedrus*), and their antibacterial potential

Ilir Mërtiri^{*}, Bogdan Păcularu-Burada, Gabriela Râpeanu, Nicoleta Stănciuc

"Dunărea de Jos" University of Galati, Faculty of Food Science and Engineering, 111 Domnească Street, 800201, Galati, Romania * Corresponding author: <u>ilir meriri@yahoo.com</u>

Abstract

The focus of this study is to present the phytochemical characterization, and antibacterial potential of two juniper varieties, *J. communis*, and *J. oxycedrus*. The berries were collected in

northern Albania and extracted using solid-liquid ultrasound-assisted extraction. The polyphenolic profile characterization of the berries extracts was performed by high-performance liquid chromatography (HPLC). At the same time, the antibacterial activity was tested against Bacillus spp., Escherichia coli, and Staphylococcus aureus on the Agar Well Diffusion Method. From the HPLC characterization of the polyphenolic profile, apigenin, kaempferol, theaflavin and quercine were the compounds found in both oh juniper berries extract in different contents. Catechin was the highest identified compound in *I. communis*, and ellagic acid in *I. oxycedrus* (93.98±0.37 μ g/g extract and 445.69±0.96 μ g/g extract, respectively). The *J. oxycedrus* extract showed a richer polyphenolic profile with 12 identified compounds from the HPLC characterization. In evaluating the antibacterial potential, all the strains were sensitive against the juniper berries extract, and the two extracts didn't show significant differences in the inhibition activity, among each other, against the tested bacterial strains. Juniper berries are known for their beneficial properties, their extracts and essential oils have been extensively used in the pharmaceutical industry. However, they also represent a significant potential in the food sector, mainly due to their bioactive compound profile and antimicrobial properties. The antimicrobial activity of juniper berries can be used against foodborne pathogens, making them a valuable and interesting source for further studies and application of their extracts in the food industry.

Keywords: Juniper communis, Juniper oxycedrus, polyphenolic profile, antibacterial activity.

PP. 3.11.

Phytochemical characterization of by-products resulted after processing of purple carrots

Alexandra Teodora Gheorghe (Mărtin)*, Gabriela Râpeanu, Oana Constantin, Nicoleta Stănciuc, Iuliana Aprodu

"Dunărea de Jos" University of Galati, Faculty of Food Science and Engineering, Domnească Street, 111, RO-800201, Galati, Romania

* Corresponding author: <u>teodora.martin83@gmail.com</u>

Abstract

The carrot (*Daucus carota L*) is one of the popular root vegetables cultivated throughout the world and is the second vegetable in the world after the potato, in a ranking of consumption, been associated since ancient times with magical powers. In the carrot processing, peels represent a valuable by-product that offer the opportunity to recover the biologically active compounds. Biologically active compounds found in red, purple and black carrots are represented by polyphenols. Among them, anthocyanins are responsible of them colour. These pigments are water soluble and can be widely used as natural colorants in the food and beverage industry. At the same time, their biochemical and pharmacological role is known, as antioxidant, anti-inflammatory, anti-atherosclerosis, anti-tumor, antimicrobial and anti-allergic agents. The main objective of our study was to evaluate phytochemical potential of purple carrot peels. Conventional solvent extraction using 50% aqueous ethanol was performed to recover natural pigments from purple carrot peels. The results revealed a content of 4,2 mg/g s.u. anthocyanins and an antioxidant activity of 2281,1 μ Mol Trolox/g s.u.

This study demonstrates the possibility of approaching a long-term strategy for the valorizing the by-products from purple carrot processing, to extract natural pigments, thus reducing food waste. They can later be used to obtain various food products with added value.

Keywords: polyphenols, anthocyanins, antioxidant activity, extraction, purple carrot

PP. 3.12.

Poly-composite films based on whey proteins concentrate and zein, with cinnamon and lavander EOs, designed for an instant powder with low lactose content

Andreea (Lanciu) Dorofte*, Daniela Tiuleanu, Iulia Bleoanca, Daniela Borda

"Dunarea de Jos University" of Galati, Faculty of Food Science and Engineering, Domnească Street 800201 Galati, Romania" * Corresponding author: <u>andreea.dorofte@ugal.ro</u>

Abstract

Bio-based films as food packaging resulting from industrial secondary products, functionalized with active essential oils (EOs) represent a sustainable alternative for active and environmentalfriendly materials. Beside the protection provided to food against various contaminants the films containing EOs are contributing to the food shelf-life extension. Cinnamon and lavander EOs have demonstrated good antioxidant and antimicrobial activities and when embedded in a proteinaceous matrix, the slow release of the volatile compounds could contribute to an improved flavour profile of the food. The aim of this study was to obtain edible films based on whey protein concentrate (WPC) and zein intended as packaging for an instant solid hot drink formula and to characterize the resulting films. Also, the properties of the solid hot drink made of whey and cocoa powder by instantisation during storage were evaluated. A solution 1.8:33 whey (WF): ultrapure water was denaturated at 82°C, 35 min. Separately, a 5.3 zein:55 solution was prepared in histoalcohool 95% and denaturated in the same conditions as the previous one. The WF and ZF solutions were mixed (34.8:60.3 and homogenised with 1.3% glycerol as plasticizing agent, 1.8% citric acid and 1.8% lavander: cinnamon EO mixture 1:1, sonicated for 2 min at 35% amplitudine, casted, dried and the films were equilibrated at 50% RH. To obtain the instant drink powder, 64.1% concentrated whey with low content of lactose was spray dried then mixed with 32.1% cocoa and 3.8% soy lecithin and later on instantized using steam ($104^{\circ}C/10$ min) then dried at 40 °C. The polycomposite films were thermally sealed by pressing between two heated plates at 90°C, thus forming packaging for the previously obtained powder.



EO's inclusion in films demonstrated a significant improvment regarding water vapour permeability, swelling index, antiradical and antimicrobial activity against *Rhodotorula glutinis*, *Geotrichum candidum* and *Bacillus cereus*. The powder packed in the polycomposite edible films was homogenous, not sticky, did not adhere to the packaging, and presented a good solubility, while a beneficial migration volatile compounds from EOs was demonstrated. In conclusion, the packaging and the powder obtained can be a sustainable solution to the currently used commercial packaging made

from plastic. **Keywords:** poly-composite films, EO's, cinnamon, lavander, whey with low lactose.

PP. 3.13.

The green algae Ulva lactuca as a potential ingredient in diets of stellate sturgeon (*Acipenser stellatus*) and sterlet sturgeon (*Acipenser ruthenus*)

Alina Nicoleta Macoveiu^a, Geanina Constandache^{a,b*}, Mirela Crețu^{a,b}, Maria Desimira Stroe^{a,b}, Angelica Docan^a, Floricel Maricel Dima^{a,b}, Lorena Dediu^b

^a "Dunărea de Jos" University of Galati, Faculty of Science and Environment, 47 Domnească Street, RO-800008, Galati, Romania

^b "Dunărea de Jos" University of Galati, Faculty of Food Science and Engineering, 47 Domnească Street, RO-800008,

Galati, Romania

*Corresponding author: geanina.culica@yahoo.com

Abstract

The use of seaweed in aqua feed has gained increasing interest due to its nutritional potential and functional advantages. Nonetheless, certain green seaweeds like Ulva lactuca have nutritional constraints due to their indigestible polysaccharides. However, these polysaccharides might still have a beneficial impact on the immune system of the fish. The objective of this study was to assess the potential positive impact of *Ulva lactuca* on two sturgeon species, *Acipenser ruthenus* and Acipenser stellatus, raised in a recirculation aquaculture system. Consequently, the experimental groups were divided into two variants for each species: one receiving a conventional diet (Control variant) and another receiving a diet supplemented with 10% Ulva *lactuca*. At the end of the experimental period of 33 days, no notable changes were observed in terms of growth performance, while FCR recorded higher values in the case of the experimental diets with Ulva compared to the control diets. However, positive effects on oxidative stress parameters were observed in the experimental groups supplemented with 10% Ulva, especially by increasing the TAC level, and a decrease in the MDA level, which suggests an improvement in the oxidative stress conditions of sturgeons. In conclusion, the study confirms the role of Ulva lactuca flour as a source of bioactive compounds, suggesting beneficial effects on the oxidative metabolism of fish

Keywords: Ulva lactuca, sturgeon, bioactive ingredients, oxidative metabolism

PP. 3.14.

Evaluation of pickled green tomatoes texture and color during storage in low sodium conditions

Daniela Constandache^{*}, Doina-Georgeta Andronoiu, Gabriel-Dănuț Mocanu, Oana-Viorela Nistor, Elisabeta Botez

"Dunărea de Jos" University of Galati, Faculty of Food Science and Engineering, 47 Domnească Street, RO-800008. Galati. Romania

* Corresponding author: <u>daniela.constandache@yahoo.com</u>

Abstract

Pickling is a traditional method for vegetables preservation, appreciated due to its simplicity, low energy consumption and enhanced sensorial properties of the final product. The main ingredient used in pickling is NaCl, which has beneficial effect against certain microorganisms' development, inducing a firm texture and a pleasant taste of the vegetables. On the other hand, sodium chloride is indictable for health issues. The objective of this study is to investigate the influence of low sodium brines on texture and color of pickled green tomatoes, during 120 days storage. A control pickling solution containing NaCl and five low sodium solutions (containing KCl, MgCl₂, NaCl:KCl, NaCl:MgCl₂, KCl:MgCl₂) were used to obtain pickled green tomatoes. Considering the fermentation process finished at 28 days of contact between green tomatoes and brines, the analyses were done at 28, 56, 94 and 120 days, which is consider the storage interval. At the beginning of storage, firmness varied between 5.12 ± 0.14 N for the control sample and 3.19 ± 0.22 N for the sample with KCl. The evolution of firmness until the end of storage interval differed with the brine

composition. For the samples with NaCl and NaCl:MgCl₂ a continuous decrease was noticed, while for the other samples no major differences were noticed. Similar behavior was registered for chewiness, which is defined as the energy required to disintegrate the samples during mastication process. From color point of view, a decrease in green component was registered for all samples, simultaneous with an increase in brightness. This behavior was the most intense for the samples with KCl:MCl₂, indicating an accentuate degradation of chlorophyl. The conclusion of the study is that the proposed brine compositions are suitable to reduce the NaCl in pickled green tomatoes. **Keywords:** pickled green tomatoes, storage, texture, color.

PP. 3.15.

Investigating specific military eating habits by applying frequency questionnaire

Ana-Maria Fundeanu, Oana-Viorela Nistor, Doina-Georgeta Andronoiu, Gabriel-Dănuț Mocanu, Elisabeta Botez

"Dunărea de Jos" University of Galati, Faculty of Food Science and Engineering, 111 Domnească Street, RO-800008, Galati, Romania *Corresponding author: <u>af207@student.ugal.ro</u>

Abstract

The present research is a sequel of an important and actual concern in the field of Romanian military diet improvement. Based on the previous results, a general scanning of the military personnel eating habits was imperatively necessary in order to complete the proper frame of the research subject. Thus, the questionnaire has been achieved according to Cambridge Biomedical Council Center by using 20 questions regarding the personal eating habits out of duty. A training sesion was developed on several similar examples of possible questions to facilitate the understanding of the study. The study was developed during 3 months. The answers were processed by using Microsoft Office - Excel 2019. The questions were grouped on the consumption of different types of meats, bread and pastry, milk products and substitutes, sweets, soups, sauces, gelified products, honey and peanut butter, non-alcohoolic or alcoholic beverages, fruits and vegetables, ready to eat products versus slow cooked foods, types of fats, salt, food supplemets, types of processing, physical effort, energy drinks and smoking frequency. Twenty one graphs were obtained based on the grouping of the main categories of questions. The results revealed similar behaviours for meats, bread and pastry, sweets and milk products consumption, while soups and sauces are not in the top of military preferences. Fruits and vegetables are not among the favorites of the group, apples and bananas being the most consumed at the expense of seasonal fruits and vegetables. In conclusion, the heterogeneity of the group, the differences between genders and the knowledge level in the healhty foods consumption are responsable for the diversity and specificity of the results.

Keywords: military personnel, frequency questionnaire, eating habits

PP. 3.16.

Influence of pressing on the quality of white wines quality

Mihaela Hozoc (Nedelcu)*, Oana Emilia Constantin, Iuliana Aprodu, Gabriela Elena Bahrim, Nicoleta Stănciuc, Gabriela Râpeanu

"Dunărea de Jos" University of Galati, Faculty of Food Science and Engineering, 111 Domnească Street, RO-800008, Galati, Romania *Corresponding author: <u>mica322244@yahoo.com</u>

Abstract

In recent years, the use of pneumatic presses with membranes has been progressively introduced in the processing of white grapes in order to produce high quality white wines. The appropriate use of these presses in the white wine technology requires knowing the conditions that influence the yield of the must and its quality. It is obvious that through pressing, a controlled extraction of phenols must be achieved (when this is necessary for a special type of wine), and the resulting must have a minimal turbidity.

The aim of this study was to evaluate the influence of the pressing method on the quality of quality white wines. A comparison was performed between two different pressing methods by using pneumatic membrane presses. The first method consists in directly pressing the destemmed and crushed grapes, and the second method consists in macerating the must inside the press.

Keywords: white wines; pressing; turbidity; maceration.

PP. 3.17.

Influence of drying methods on physico-chemical and functional properties of red grape pomace powder

Larisa Anghel^{*}, Gabriel - Dănut Mocanu, Nicoleta Stănciuc

"Dunărea de Jos" University of Galati, Faculty of Food Science and Engineering, 111 Domnească Street, RO-800201, Galati, Romania *Corresponding author: anghellarisa98@yahoo.com

Abstract

The winemaking process generates high quantities of grape pomace, a rich source of various biologically active compounds used for nutritional foodstuff production. In the present study the effects of infrared drying (IR) and convective drying (CD) on physical, chemical, and functional properties of grape pomace (*Vitis vinifera* var. Băbească Neagră) powder were examined. IR dried grape pomace powder contains high quantities of protein (14.64 and 16.16 g/100g), fat (7.57 and 9.3 g/100g), ash (3.98 and 4.77 g/100g) and carbohydrates (67.65 and 64.29 g/100g). Our results showed that IR drying method increased the content of bioactive compounds (total phenolic compounds, total flavonoids, total monomeric anthocyanin) and antioxidant capacity of grape pomace powder. All analyzed powder samples revealed a good water-holding capacity, a poor oilholding capacity, a fair flowability and intermediate cohesiveness related to Carr index and Hausner ratio. Drying resulted in noticeable color changes (color of grape pomace powders varied from red to more purple) for all analyzed samples. The results of this study showed that infrared drying is a more suitable technique to maintain grape pomace bioactive compounds and functional properties compared to convective drying.

Keywords: by-product valorization, grape pomace, functional properties, physico-chemical properties.

PP. 3.18.

Investigations on vegetal proteins addition on the functional and rheological behavior the gluten-free flours

Anca Lupu, Iuliana Banu, Ina Vasilean, Gabriela Râpeanu, Nicoleta Stănciuc, Iuliana Aprodu*

"Dunărea de Jos" University of Galați, Faculty of Science and Engineering, 111 Domnească Street, RO-800201, Galati, România

* Corresponding author: iuliana.aprodu@ugal.ro

Abstract

The gluten-free diet is essential for people dealing with celiac disease or gluten allergy. Therefore, identifying the appropriate combinations of gluten-free cereals and pseudocereals with good technological functionality and bread making properties is highly desired. The first objective of this study was to evaluate the solvent retention capacity of sorghum and quinoa flours, alone and in admixture. In this respect, different formulas of native or heat treated pseudocereal flours were

considered in the study, eventually enriched with proteins of vegetal origin. Six types of solvents were used in order to gather information on the performance of the main chemical compounds of the flour, such as proteins, starch and fibers. This test resulted in useful information which can be further exploited to adjust the composite flour formations and baking parameters, in order to improve the quality of the different gluten free products. In addition, the swelling power and the solubility index of the gluten free flours formulations were estimated. The flour suspensions were heat treated at various temperatures ranging from 55°C to 95°C, in order to observe the relationship between thermal and rheological characteristics and the swelling power. Moreover, the influence of the proteins' addition to the gluten-free flour mixtures was determined. The fundamental rheological measurements indicated that all tested suspensions based on the gluten-free composite flour exhibited shear thinning behaviour. The obtained results indicate that proteins supplementation of the composite flour consisting of sorghum and quinoa flour might allow better technological functionality and bread-making properties.

Keywords: composite flour, gluten-free formulations, solvent retention capacity, rheological behaviour

PP. 3.19.

Green strategies for the valorization of grape pomace to obtain added value products

Nicoleta Balan*, Gabriel - Dănuț Mocanu, Nicoleta Stănciuc

"Dunărea de Jos" University of Galati, Faculty of Food Science and Engineering, 111 Domnească Street, RO-800201, Galati, Romania *Corresponding author: <u>Nicoleta.Balan@ugal.ro</u>

Abstract

Grapes are among the top five most cultivated fruits globally. Over the last years, the recuperation of important compounds from food waste as grape pomace is a challenge for the food industry. Grape pomace (mixture of skins, remaining pulp, seeds, and stalks) is an important by-product from winemaking process, rich in different bioactive compounds, like polyphenols, flavonoids, anthocyanins, and tannins. The recuperation of these bioactive compounds by the most adequate and eco-friendly extraction methods and capable to maximize yield without compromising the product quality is a challenging task. Various conventional and non-conventional extraction techniques (chemical, physical, and biotechnological) have been used to recover bioactive compounds from this by-product. These methods allow a significant diminution of extraction time, increase the mass transfer, reduce the solvent and energy consumption. The grape pomace was used as a fortifying agent to obtain added-value products such as plant origin food, dairy, fish, meat products, bread, and beverages due to higher bioactive compounds and dietary fiber contents. In these conditions, the valorization of grape pomace is very important not only for reducing environmental pollution but also for increasing the wine industry profit.

Keywords: grape pomace, by-product, food fortification, valorization, extraction methods.

PP. 3.20.

The power of food education

Cornelia Hodorogea (Huhulea)^a, Maria Turtoi^{b*}

^aDoctoral School of Fundamental and Engineering Sciences, "Dunarea de Jos" University of Galati, Romania ^b"Dunarea de Jos" University of Galati, Cross-Border Faculty, 111 Domnească Street, Galati, Romania * Corresponding author: <u>maria.turtoi@ugal.ro</u>

Abstract

Food and eating are part of every human's daily life. Food choices and eating behaviours made throughout life can influence health status, quality of life and life span. Global projections

estimated by the World Obesity Atlas show an increase in the number of overweight or obese adults from 42% of adults in 2020 to more than 54% by 2035. Statistics show that three-quarters of deaths recorded each year are caused by non-communicable diseases, the dominant risk factors of which are mainly related to diet and lifestyle: high blood pressure, high blood sugar, obesity, and a diet high in sodium and low in whole grains, fruits, nuts, seeds, and vegetables. Pathological conditions can be delayed or removed by prevention. Food education is an essential step in this direction. This consists of various educational strategies designed to help people achieve long-lasting improvements in their diets and eating behaviours. The best strategies need an interdisciplinary approach, and their design and implementation require collaboration between specialists in the educational system, the health system, the agriculture, and the food industry with the support of governments and organisations that aim to improve nutrition worldwide. Health is one of the most important values, both for the individual and for society, and it represents an essential condition for the sustainable development of a nation. Promoting food education and raising awareness of the importance of a balanced and varied diet must be prioritised in all countries.

Keywords: food education, health, eating behaviours.

PP. 3.21. Presence of organic acids in wines with implications in authentication and quality of wines

Marian (Țoca) Gianina^{*}, Gabriela Râpeanu, Nicoleta Stănciuc, Iuliana Aprodu, Oana Emilia Constantin

"Dunărea de Jos" University of Galati, Faculty of Science and Environment, 47 Domnească Street, RO-800008, Galati, Romania

* Corresponding author: tocagianina@gmail.com

Abstract

Although in the past, the organic acids contribution was highly under-appreciated, over time it has been proven that they are natural compounds with antioxidant, antimicrobial and antiinflammatory properties. Thus, nowadays organic acids have attracted increased attention as they are responsible for both the organoleptic and chemical characteristics of final wines. Acids in wine, such as tartaric, malic and citric acid, contribute to the acidity and freshness of the wine. These acids can give to the wine a wide range of flavours, from fruity to mineral and spicy. The determination of total acidity is a defining parameter at certain stages of the winemaking process, so as the total acidity value to fall within the limits set by the actual legislation. Malic acid is transformed during malolactic fermentation into lactic acid, which raises the pH and decrease the titratable acidity, giving to the resulting wine a velvety taste. Citric acid is an organic acid and is considered to be an important compound in the metabolic process of wines. A quantity higher than 1 g/L citric acid indicating the adulteration of wine. The total amount of acids in wine are related by the grape variety, the location of the vineyard, the ripeness levels of the grapes and the year of the harvest. During the ripening of the grapes, malic acid is formed first, and later the tartaric acid. Tartaric acid is most commonly used to correct the lack of acidity of the must in maximum doses of 1.5 g/L in order to obtain balanced wines with a minimum total acidity of 3.5 g/L. Tartaric and citric acids are organic acids which are authorized by the OIV to be added to wine. Wine authentication is important to the process of identifying fraud. Various physical and chemical analytical techniques being used for this purpose. The aim of this study was to review classical and modern methods used to quantify the presence of acids in wines which can be used as markers for wine traceability and authentication.

Keywords: organic acids, analytical methods, wine traceability, wine authentication.

SECTION 5 ADVANCED RESEARCH IN ELECTRICAL / ELECTRONIC ENGINEERING, SYSTEM ENGINEERING AND INFORMATION TECHNOLOGIES

PP.5.1.

Analysis of the electrical installation used on a hybrid ship

Marin George-Andrei^{a,*}, Gaiceanu Marian^b

"Dunărea de Jos" University of Galati, Faculty of Automation, Computers, Electrical and Electronics Engineering, Science nr. 2 Street, RO-800210, Galati, Romania * Corresponding author: <u>marian.gaiceanu@ugal.ro</u>

Abstract

This research presents the integration of hybrid propulsion systems in maritime transport, which has garnered significant attention due to their potential to improve fuel efficiency and reduce emissions. An integral element of hybrid ships is the electrical installation, which plays a crucial role in managing power generation, distribution, and propulsion. This analysis focuses on examining the electrical installation used on a hybrid ship, evaluating its design, functionality, and performance.

In conclusion, the electrical installation used on a hybrid ship is a complex and multifunctional system that plays a vital role in facilitating efficient and sustainable maritime transport. Through efficient power generation, distribution, and propulsion integration, hybrid ships can achieve significant reductions in fuel consumption and emissions while maintaining high levels of reliability and safety. Continuous advancements in technology and design will further improve the performance and capabilities of electrical installations on future hybrid vessels.



Keywords: generating electrical energy, distribution and energy management, integration of propulsion system, safety and redundancy.

PP. 5.2.

Neural networks application in the context of edge classification

Gigi Tăbăcaru^{a,*}, Simona Moldovanu^{b,c}, and Marian Barbu^a

^aDepartment of Automatic Control and Electrical Engineering Faculty of Automation, Computers, Electrical, Engineering and Electronics, "Dunarea de Jos" University of Galati, Romania, gigi.tabacaru@ugal.ro, marian.barbu@ugal.ro

^bComputer Science and Information Technology, Faculty of Automation, Computers, Electrical Engineering and Electronics, "Dunarea de Jos" University of Galati, simona.moldovanu@ugal.ro ^cThe Modelling & Simulation Laboratory, "Dunarea de Jos" University of Galati, 47 Domneasca Street, RO-800008, Galati, Romania

* Corresponding author: gigi.tabacaru@ugal.ro

Abstract

Neural networks (NNs) are correlated with the image processing filed, yielding interesting results in the classification of different diseases. This study examined the MRI data acquired from

scanning human brain images to identify both stable and unstable disorders. By significantly decreasing the amount of data and filtering the information, the edge detection technique preserves both the essential structural components of an image and the necessary information. In this work, we used the Sobel filter, which is suggested because of its rapid detection speed and positive impact on edge identification. Two odd kernels are used by the Sobel filter to adjust for changes in both the horizontal and vertical directions. Relevant features that fed three NN were performed by projecting the edges into a horizontal and vertical histogram and analyzing it using the standard deviation, skewness, and kurtosis. In binary classification, the accuracy of the Cascade Forward, Feedforward, and Pattern Recognition NNs was 75.22%, 75.11%, and 75.9%, respectively.

Keywords: sobel filter; edge detection; neural netwok; image processing.

PP. 5.3.

Forecasting crime trends: A time series analysis approach

Paul Iacobescu^a

^a "Dunărea de Jos" University of Galati, The School for Doctoral Studies in Fundamental and Engineering Sciences, 47 Domnească Street, RO-800008, Galati, Romania * Corresponding author: <u>paul.iacobescu@ugal.ro</u>

Abstract

Time series analysis techniques offer valuable tools for law enforcement agencies, policymakers, and community organizations to better understand, predict, and prevent crime. By analyzing historical crime data and identifying patterns and trends, these techniques can inform targeted strategies and interventions that aim to reduce crime and enhance public safety effectively. This research explores the use of time series analysis techniques to evaluate and predict crime trends in urban areas. By analyzing historical crime data, we aim to uncover underlying patterns and dynamics in crime occurrences over time. Leveraging advanced methodologies such as statistical and machine learning models, our study seeks to provide insights into the factors driving variations in crime rates across different temporal contexts and geographical areas, ultimately contributing to the creation of safer and more resilient communities.

Keywords: artificial intelligence, machine learning, time series, crime trends.

PP. 5.4. Determination of the vector position of a three-phase asynchronous motor drive system using a SKF Dynamic motor analyzer

Necula Raluca-Elena*

"Dunărea de Jos" University of Galati, Faculty of Automation, Computer, Electrical and Electronic Engineering, Științei Street, RO-800008, Galati, Romania * Corresponding author: <u>necularaluca@yahoo.com</u>

Abstract

The aim of this paper is to determine the vector position of an actuation system containing a three-phase asynchronous motor, a variable frequency converter, using a special SKF Dynamic Motor AnalyzerEXP4000 instrument.

The first objective for this action plan is to connect to the lab stand containing the items listed above.

The second objective is to make measurements in the physical stand and for each electrical phase the values for the angles corresponding to the analyzed vector system will be identified. **Keywords:** asynchronous motor, electric drive system, SKF Dynamic Motor Analyzer EXP4000, variable frequency converter,

PP. 5.5. Application of ANN for precise measurement and control in wastewater treatment facilities

Daniel Voipan^{*}, Iulian Vasiliev, Larisa Diaconu, Marian Barbu

"Dunărea de Jos" University of Galați, Faculty of Automation, Computer Sciences, Electronics and Electrical Engineering 47 Domnească Street, RO-800008, Galati, Romania * Corresponding author: <u>Daniel.Voipan@ugal.ro</u>

Abstract

The negative environmental impact of wastewater management is a major global challenge that requires innovative solutions to address. In order to handle newly identified contaminants, conventional wastewater treatment techniques must be refined, with a focus on providing precise predictions of process performance and resource requirements. A paradigm shift is necessary to recognize wastewater as a valuable resource due to the increasing water constraints. Building a sustainable and circular economy can be achieved by treating and recycling wastewater, reducing freshwater demand, and leaving as little environmental footprint as possible. The aim of this paper is to explore the use of Artificial Neural Networks (ANNs) as software estimators for wastewater treatment, emphasizing the estimation of ammonium concentrations in effluent. In order to handle uneven time-series data, the study proposes new data preprocessing procedures. These strategies are comprised of a Sliding Window protocol, Data Normalization, and a K-Fold training program. The potential of ANNs to change wastewater treatment techniques and drive advancements in this industry can be demonstrated by this. The proposed approach outperforms other approaches to estimate pollutant concentrations, demonstrating the capacity of ANNs to do so.

Keywords: Soft Sensor, Artificial Neural Network, BSM2, Wastewater Treatment Plants, ANN Prediction

PP. 5.6.

Electromagnetic compatibility issues on board military ships

Vasile Solcanu^{a,*}, Marian Găiceanu^b, Georgiana Rosu^c, Marius Solomon^d

^{a,b d} "Dunărea de Jos" University of Galati, 47 Domnească Street, RO-800008, Galati, Romania, vasilesolcanu@dedeman.ro, <u>marian.gaiceanu@ugal.ro</u>

^cFaculty of Communications and Electronic Systems for Defense and Security in the Military Technical Academy, Bucharest, Romania, <u>georgianamarin01@gmail.com</u>

* Corresponding author: <u>vasilesolcanu@dedeman.ro</u>, <u>vasilesolcanu17@gmail.com</u>

Abstract

Starting from the intentional electromagnetic interference definition, the malicious electromagnetic energy generated to damage, confuse or compromising the communication systems of the military ships, at last to damage these systems for terrorist purposes, the electromagnetic compatibility is one of the important aspects in ensuring the safety and defeat strategy of the military ships.

This article aims to present the main types electromganetic disturbances, their characteristics and mode of action as well as the main protective measures that must be taken into account to limit the negative effects on the radio communication equipment on board a military ship. **Keywords**: electromagnetic interference, military ship, radio communication equipment, electromagnetic compatibility.

PP. 5.7.

Power Injection into the Grid by means of the Synchronous Machine

Răzvan Buhosu*, Marian Gaiceanu, Marin George- Andrei, Marius George Solomon

"Dunărea de Jos" University of Galati, 47 Domnească Street, RO-800008, Galati, Romania, Razvan.Buhosu@ugal.ro, <u>Marian.Gaiceanu@ugal.ro</u> *Corresponding author: <u>Razvan.Buhosu@ugal.ro</u>

Abstract

The research topic of the paper is dedicated to the synchronous generator control in power system. Satisfactory operation of an AC power system is obtained when the frequency and voltage remain constant or varies in a limited and controlled way when the active and reactive loads vary. Quality control depends on the speed control of the synchronous generator and other influences induced by the frequency load dependence.

In this paper the behavior of a synchronous machine connected to the national grid has been studied. The fluctuations in voltage across the generator during a fault occurrence and fast return to the nominal value after the fault has been studied.

Keywords: synchronous machine, power quality, grid

PP. 5.8.

Electrical Vehicle Wireless Charging System

Răzvan Buhosu^{*}, Marian Gaiceanu, Răzvan Buhosu, Marian Găiceanu, Marin George- Andrei, Marius George Solomon

"Dunărea de Jos" University of Galati, 47 Domnească Street, RO-800008, Galati, Romania, <u>Razvan.Buhosu@ugal.ro</u>, <u>Marian.Gaiceanu@ugal.ro</u> *Corresponding author: <u>Razvan.Buhosu@ugal.ro</u>

Abstract

The worldwide expansion of the electric vehicles requires the development of the charging infrastructure. This research has in view the design and testing of the wireless power transfer system. An overview of the electric vehicles wireless chargers will be investigated. There are different WPT operation modes. Based on them different charging strategies could be implemented to speed-up the charging process. The advantages and disadvantages will be presented. The numerical results of the designed WPT system will be shown. **Keywords**: electric vehicle, charging system, V2X

SECTION 6 FUTURE OF ECO-NANOTECHNOLOGIES, FUNCTIONAL MATERIALS AND COATINGS

PP.6.1.

Innovative strategies for enhancing electrochemical sensors based on chitosan for detecting bioactive compounds

Alexandra Virginia Bounegru^{a,*}, Iulian Bounegru^b

a"Dunărea de Jos" University of Galati, Faculty of Science and Environment, 111 Domneasca Street, RO-800008, Galati, Romania

^b"Dunărea de Jos University of Galati, Faculty of Engineering, 111 Domneasca Street, RO-800008 Galati,

Romania

*Corresponding author: alexandra.meresescu@ugal.ro

Abstract

The aim of this study is to summarize innovative strategies for modifying and constructing electrochemical sensors based on chitosan, with a focus on enhancing sensitivity and selectivity for detecting various bioactive compounds. Electrochemical sensors based on chitosan benefit from innovative strategies to enhance their sensitivity and selectivity. One of these strategies involves combining chitosan with conducting polymers, such as polyaniline and polypyrrole, to compensate for chitosan's low electrical conductivity[1]. Another innovative approach is the molecular imprinting of chitosan, creating polymer matrices with specific recognition for target molecules [2]. Various fabrication methods, such as electrodeposition and drop casting, are used to construct electrochemical sensors, providing precise control over the thickness and composition of the chitosan film. Extraction of target molecules from molecularly imprinted polymers is a crucial step, and electrochemical techniques such as cyclic voltammetry and chronoamperometry are employed for their detection. Therefore, innovative strategies for modifying and constructing electrochemical sensors based on chitosan contribute to the development of efficient devices for detecting and monitoring pharmaceutical substances in various environments.

Keywords: polymer, pharmaceuticals, electrochemical sensor.

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PP.6.2.

Extract of pomegranate (*Punica granatum L*.) as a solution for membranes having antioxidant properties

Alexandra Ionescu, Iulian Cristian Areș, Rodica Mihaela Dinică, Geta Cârâc*

^aDepartment of Chemistry, Physics and Environment, Faculty of Sciences and Environment, "Dunarea de Jos" University of Galati, 111 Domneasca Street, 800201, Galati, Romania *Corresponding author: <u>getac@ugal.ro</u>

Abstract

Ellagic acid (EA) is a bioactive polyphenolic compound that occurs naturally as a secondary metabolite in many plants (e.g. pomegranate-*Punica granatum* L.). It is a dimeric derivative of

gallic acid produced primarily by hydrolysis of ellagitannins, a group of secondarily distributed metabolites. EA exhibits antioxidant, anti-inflammatory, antimutagenic, and antiproliferative properties, and it is known to have pharmacological effects in various *in vitro* and *in vivo* model systems [1]. EA may be involved in regulating a spectrum of cell signaling pathways to prevent, mitigate, or slow the progression of chronic disorders, including cardiovascular and neurodegenerative diseases, diabetes, and cancer [2]. The extracts from pomegranate, seed and peel extracts, separately and added in membranes with chitosan to confirm the improving of antioxidant properties were investigated by chemical and electrochemical (OCP, CV) and structural (UV-Vis, FTIR, SEM-EDX) analysis.

Keywords: ellagic acid, antioxidant, extract, pomegranate, membranes

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PP.6.3.

Synergistic impact of biocides and fungi on metallic surfaces intended for bioprocessing

Maricica Stoica^{a,*}, Geta Cârâc^b

^aCross-Border Faculty, "Dunarea de Jos" University of Galati, 47 Domneasca Street, 800008 Galati, Romania

^bFaculty of Sciences and Environment, "Dunarea de Jos" University of Galati, 47 Domneasca Street, 800008 Galati, Romania

* Corresponding author: Maricica.Stoica@ugal.ro

Abstract

Disinfection of bioprocessing equipment represents a set of interactions between the bioprocessing lines, undesirable microorganisms and biocides. The studies carried out indicated a synergic effect of the biocide – fungi mixtures, the bioprocessing surfaces being more susceptible to degradation in biocide – fungi mixtures than biocides only.





The synergic effect of biocide – fungi mixtures cannot be ignored. The mixtures decrease the bioprocessing surface resistance to degradation (Figure 1) and may favor the appearance of

unwanted fungal colonization sites on the bioprocessing surfaces. **Keywords:** bioprocessing equipment surface, microorganisms, biocides.

PP.6.4.

Obtaining of functionalized biomaterials based on chitosan

Iuliana Florina Costea (Nour)*, Geta Cârâc

Department of Chemistry, Physics and Environment, Faculty of Sciences and Environment, "Dunarea de Jos" University of Galati, 111 Domneasca Street, 800201, Galati, Romania. *Corresponding author: <u>iulianaflorinanour@gmail.com</u>

Abstract

Chitosan, next to cellulose, is the most widespread biopolymer in nature which being a biomaterial with multiple applications in many fields. Chitosan-based biomaterials have been reported in the medical field, due to its important biological properties such as biocompatibility, biodegradability and low toxicity, or in pharmaceutical technology, as an antimicrobial and antitumor agent [1]. It is a great interest to obtain new functional derivatives as antimicrobial agents for a growth of its efficiency and specificity [2]. In this way, the development of new solutions that could improve human health by increasing the solubility of chitosan and by modifying its chemical structure in order to obtain new products with antibacterial properties was our task in doctoral thesis, using heterocyclic compounds, of class 4,4, dipyridyl [3].

Keywords: biomaterials, chitosan derivates, functional properties, applications **References:**

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