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ORAL PRESENTATIONS

O.1. BLOCKING MICROBE COLONIZATION IN AVOCADO (*PERSEA NUBIGENA* VAR. *GUATEMALENSIS*) EXOCARP THROUGH POSTBIOTICS TREATMENT

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Abstract

Foodborne pathogens growth can be controled using diverse metabolites such as postbiotics produced by lactic acid bacteria. Avocado is a common crop in Ecuador. The improper manipulation and storage postharvest are among the common factors that affect the bacteriological quality of these crops. In this study, we design several formulations based on postbiotics from lactic acid bacteria and evaluate their inhibitory effect and possible mode of action towards two multi-drug resistant Staphylococcus isolated from avocados. Furthermore, avocados at the immature ripe stage treated with the inhibitory formulation (IF) and the effect on fruit quality was evaluated. When comparing the IF-treated samples to the non-treated control, a statistically significant ($p < 0.05$) reduction in cell counts was observed by day 8, indicating that FI inhibited microbial colonization during storage. The treatment had no effect on the fruit quality attributes, which include pH, total soluble solids, total titratable acidity, antioxidant capacity and total polyphenol content. These findings imply that the active ingredients containing IF may form a barrier between the exocarp and mesocarp, preventing endemic microorganisms from growing and finally extending the postharvest fruit quality.

Key words*: postbiotics, antimicrobials, avocado, multi-drug resistance, Staphylococcus, food contamination.*

O.2. HALOPHYTES: TOOLS FOR RECLAIMING SALINISED AGRICULTURAL LAND

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Abstract

The progressive salinisation of irrigated cropland, exacerbated by climate change, is one of the leading causes of the reduction of crop yields worldwide, representing a severe threat to food security. Halophytes, wild plants adapted to naturally saline habitats, represent valuable tools to reclaim lost salinised agricultural land. First, as the basis of "saline agriculture", growing them commercially as "minor crops" for food, feed, fibre, biofuels, compounds of industrial interest, or as ornamental or medicinal plants. They could be cultivated in saline soil and irrigated with saline water, not competing with conventional crops for these limited resources. Some breeding will be necessary to improve specific agronomic characteristics, but they already possess the most challenging trait to be introduced by breeding: salt tolerance. Many halophytes are salt/heavy metal hyperaccumulators and can also be used for phytoremediation and desalination of salt-affected land, even growing them with standard crops (intercropping, crop rotations). The same approaches can be used in naturally saline, marginal soils that are useless for cultivating our salt-sensitive crops. This review will discuss some examples of these proposed uses of halophytes.

Key words*: climate change, soil salinisation, saline agriculture, phytoremediation, marginal soils.*

O.3. PRODUCTION OF PROTEIN HYDROLYSATES WITH BIOSTIMULANT ACTIVITY FROM OLIVE SUPPLY CHAIN WASTE

Eleonora CALZONI[1, 2], Ciro TOLISANO[3], Agnese BERTOLDI[1], Nicolò MONTEGIOVE[4], Alessio CESARETTI[1, 2], Dario PRIOLO[3], Daniele DEL BUONO[3], Carla EMILIANI[1, 2]

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Abstract

Agro-industrial activities generate large amounts of waste that must then be disposed of; in the Mediterranean region, for example, significant amounts of by-products, such as olive mill wastewater, pomace, and olive stone, are derived from the olive oil extraction process, which can have significant environmental and economic implications. In particular, olive mill wastewater and pomace have a considerable content of bioactive molecules that can be recovered by applying or developing appropriate technologies. The aim of this work was therefore the production of Protein Hydrolysates (PHs) from oil production by-products, applying an innovative ad eco-friendly technology based on mild thermal hydrolysis that, unlike traditional chemical hydrolysis, it is performed under mild conditions of pH and temperature, allowing to obtain a good quality hydrolysate characterized by a high content of peptides and single amino acids. The obtained PHs were tested on Zea mays seeds and leaves to evaluate their effect on the crop in the early stages and the foliar growth. A metabolomic analysis was also performed in order to evaluate the alteration in some characteristic metabolic pathways.

Key words*: olive mill wastes, protein hydrolysates, biostimulants, pomace, wastewater.*

O.4. HEAVY METAL CONTAMINATION IN SOIL AND ITS ACCUMULATION IN HOME GROWN TOMATO (*SOLANUM LYCOPERSICUM* L.) FRUITS

Natália ČERYOVÁ, Judita LIDIKOVÁ, Monika ŇORBOVÁ, Silvia FEDORKOVÁ, Alena VOLLMANNOVÁ, Janette MUSILOVÁ, Ľuboš HARANGOZO

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Abstract

The paper aimed to assess the hygienic quality of soils in home gardens and the safety of consumption of tomatoes grown in these soils. Fruits of three tomato cultivars, namely Radana, Tornado F1, and Cherolla F1 from four localities of Slovakia (Sabinov, Žilina, Oravská Lesná, Hliník nad Hronom) along with soil samples were analysed using Varian AA 240FS/240Z atomic absorption spectrometer. Based on the results, all soils can be classified as highly contaminated, extremely polluted, and of high to very high risk. Results showed that monitored cultivars are not bioaccumulators of analysed risk elements, however, the content of Pb and Cd exceeded the limits set by Commission Regulation (EU) 2023/915 in some of the samples. While the results of the health risk assessment showed that consumption of monitored cultivars does not pose a risk to the consumers, it is important to take other dietary sources of risk elements into account, since monitored tomatoes alone could contribute up to 5.7 % of the provisional monthly intake of Cd.

Key words*: cadmium, lead, risk elements, Solanum lycopersicum L., tomato.*

O.5. TOTAL PHENOLIC CONTENT AND ANTIOXIDANT ACTIVITY EVALUATION OF OLIVE MILL POMACE EXTRACT

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Abstract

Olive oil production generates different by-products such as olive mill wastewater and olive pomace OP, considered low-cost sources of bioactive compounds including polyphenols that show remarkable antioxidant properties. The objective of this work study was to conduct an assessment of the total polyphenol content TPC and antioxidant activity of different OP extracts recovered through liquid-liquid solvent extraction. OP samples were obtained from both two and three-phase extraction processes of olive oil production. Several solvents (water, methanol, ethanol, and n-hexane) have been used to extract phenolic compounds with ultrasound-assisted techniques (UAE). Folin-Ciocalteu assay was used to determine the TPC in olive oil pomace samples. The total antioxidant activity of phenolic extracts was evaluated using 2,2-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging activity and phosphomolybdate assay. The highest extraction efficiency of phenolic compounds was obtained using a combination of ethanol: water (80:20). Three-phase decanter system showed higher values of TPC (0.7-0.8 g gallic acid equivalent/L extract), antioxidant activity (80-105% antiradical activity), and total antioxidant capacity (90-109% TAC) compared with the two-phase. Based on the results, OP has antioxidant qualities and may be useful in food formulation.

Key words*: total phenolic content, antioxidant activity, olive pomace, food formulation.*

O.6. DEVELOPMENT OF THE LACTIC ACID PERMEABILIZER V-QPCR TECHNIQUE FOR *SALMONELLA* SPP. DETECTION AND QUANTIFICATION

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Abstract

In the food industry, one of the biggest challenges is microbial contamination. Viability real-time PCR (v-qPCR) technology has made the detection and quantification of pathogens easier, and some issues remain with the accuracy of the results, especially in samples containing viable and non-viable cells. V-qPCR with propidium monoazide (PMA) and pre-treatment with permeability agents is one promising method to circumvent this issue. Therefore, the aim of the study was to improve the Salmonella spp. detection using a method with lactic acid (LA 5-10 mM) pre-treatment that permeabilized gram-negative outer membrane. The signal reduction (dC_t = 13.97) after 10 mM LA pre-treatment was similar with the reduction in C_t signal (dC_t = 13.62) when only PMA treatment was applied to a suspension of non-viable cells. In the case of viable cells, the LA pre-treatment improved the v-qPCR detection. These preliminary studies provide useful information on the use of lactic acid, which has proven to be an effective, cheap and low-toxic permeabilizing agent.

Key words*: lactic acid, PMA, v-qPCR, pathogen detection, food safety application.*

O.7. PERFORMANCES OF TWO EXTRACTION KITS OF AFRICANE SWINE VIRUS GENOME

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Abstract

Currently, the ASF (African Swine Fever) diagnosis is carried by the detection of viral DNA. The successful amplification of the targeted DNA fragment needs a proper quantity of the genetic material. The aim of this study was to compare the yield and quality of DNA extracted using two dedicated commercial kits. It was compared the product obtained using the Pure Link Genomic DNA Mini Kit (Invitrogen) and QIAamp cador Pathogen Mini Kit (Qiagen). The DNA has been quantified using Qubit DNA HS Assay Kit (Qubit 3.0 Fluorometer, ThermoFisher Scientific), a highly selective over RNA and accurate tool for double-stranded DNA (dsDNA) at concentrations ranging from 10 pg/µL to 100 ng/µL. The standard DNA of the ASF virus has been diluted 10^{-2} 10^{-3}, 10^{-4}, 10^{-5} and 10^{-6} as both of the extracts obtained with Pure Link Genomic DNA Mini Kit (Invitrogen) and the QIAamp cador Pathogen Mini Kit (Qiagen). According to the dilutions (10^{-2} to 10^{-6}), the DNA yield with the QIAamp Cador Pathogen Mini Kit was 132 ng/µl, 71 ng/µl, 45 ng/µl, 21.2 ng/µl and 10.2 ng/µl. The yield obtained with the Pure Link Genomic DNA Mini Kit was 126 ng/µl, 65 ng/µl, 31 ng/µl, 15.2ng/µl and 4.2 ng/µl.
The highest concentration was obtained using QIAamp Cador Pathogen Mini Kit. We can conclude that the sensitivity of the QIAamp cador Pathogen Mini Kit is more suitable to be used for further investigation on the ASF genome.

***Key words**: ASFv, DNA extraction, fluorometer.*

O.8. COMPARATIVE ANALYSIS OF BRAZZEIN PRODUCTION IN *IN VIVO* AND *IN VITRO* SYSTEMS

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Abstract

Brazzein, a highly potent sweetener derived from the fruit of the African plant Pentadiplandra brazzeana, has garnered attention due to its potential as a low-calorie alternative to sugar. This study presents a comparison between in vivo and in vitro systems for the production of brazzein, focusing on yield, cost-effectiveness, and sustainability. Utilizing genetically modified organisms (GMOs) in in-vivo systems, specifically engineered yeast and bacteria, we explored the scalability and efficiency of brazzein production. Conversely, in-vitro systems involved cell-free synthesis, highlighting the control over production conditions and the reduced risk of contamination. Economic analysis revealed that while in vivo systems benefit from lower initial investment costs and higher production rates, in vitro systems may offer long-term sustainability and lower environmental impact, attributed to reduced resource consumption and waste generation. This study provides critical insights into the feasibility of scaling brazzein production for commercial use, evaluating the pros and cons of each system. Further research into genetic engineering and optimization of culture conditions could enhance the efficiency and yield of brazzein production, contributing to the development of healthier sweetening options for the global market.

Key words*: brazzein, cell free protein systems, in vitro, in vivo, production, sweet protein, Tx-Tl.*

O.9. TOXIGENIC *PENICILLIUM* CONTAMINANTS IN SUDANESE POULTRY FEED AND POTENTIAL BIOCONTROL STRATEGY

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Abstract

This study focuses on Penicillium contaminants found in poultry feed sourced from Sudan. Such fungi were found in sorghum kernels, shelled peanuts, wheat bran and peanut meal from seven Sudanese regions. These fungi were isolated and characterized based on their microscopic features and colony morphology on Dicloran Rose Bengal Chloramphenicol Agar (DRBC), Potato Dextrose Agar (PDA), and Pentachloronitrobenzene - Rose Bengal - Yeast extract - Sucrose Agar (PRYES). To evaluate their mycotoxigenic potential, chromatographic and genetic approaches were used. Fungal extracts were evaluated for mycotoxins content by Thin-Layer Chromatography (TLC). Structural and regulatory genes such as aflR, omt, otanps, nor-1, ver-1 involved in mycotoxins production were analyzed by classical PCR technology. Some of the strains were also identified by sequencing the ITS1 – 5,8S – ITS2 region. To inhibit the growth of these Penicillium isolates certain biocontrol agents were used, revealing high antifungal potential. These findings provide valuable insights into the nature of Penicillium contaminants in Sudanese poultry feed, providing fundamental knowledge for further research on managing mycotoxigenic contaminants and feed safety.

Key words*: biocontrol, mycotoxin, PCR, Penicillium, poultry feed, Thin-Layer Chromatography (TLC), sequencing.*

POSTER PRESENTATIONS

SUBSECTION I: AGRICULTURAL BIOTECHNOLOGY

P.I.1. STUDIES ON SOME BIOACTIVE COMPOUNDS FROM COLORED WHEAT

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Abstract

The varieties of colored wheat registered are very limited, and those available have a low agronomic value. The anthocyanin compounds present in colored wheat vary depending on the wheat variety as well as the growing conditions. Due to their antioxidant activity, anthocyanins are of increasing interest to nutritionists, food researchers and plant breeders. The objective of this work was to determine some bioactive compounds from wheat genotypes "H171-I" with purple grains and "H171-III" - with red-purple grains. The samples were evaluated by UV-VIS spectrophotometry for anthocyanins, phenols, enzymes and total antioxidant capacity. The determinations showed that the highest level of anthocyanins was found in the genotype H171-I, followed by "Pitar" and H171-III; phenolic compounds were present in all wheat genotypes, but unlike the other samples, they were synthesized at higher levels in the genotype H171-I. This genotype also had the highest total antioxidant capacity. Data on the activity of polyphenol oxidase and peroxidase enzymes showed a high level for both enzymes in the red grains 'Pitar' genotype. The analyzed compounds varied according to the investigated wheat variety.

Key words*: anthocyanins, antioxidant capacity, colored wheat, enzymes, phenols.*

P.I.2. DEVELOPMENT OF EFFECTIVE METHODS FOR *IN VITRO* PROPAGATION AND CONSERVATION OF THE ENDEMIC SPECIES *MOEHRINGIA HYPANICA* GRYNJ ET KLOKOV

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Abstract

Moehringia hypanica Grynj et Klokov is a relict, rare, endemic, narrow-coloured southern Bug species, which is listed in the IUCN VU category, and is also included in Appendix I of the Bern Convention, the European Red List and the Red Data Book of Ukraine with an uncertain status (I category of rarity). Therefore, the aim of our research was to develop effective methods of in vitro propagation of M. hypanica to obtain massive plant material and long-term, aseptic storage of explants. The period from sowing seeds collected in nature to nutrient media, followed by microclonal propagation of regenerated plants, lasted about 160-180 days. The M. hypanica plants were successfully propagated on the culture media modified with the addition of 0.50 and 0.70 mg/l of 6-BAP and 0.10 and 0.12 mg/l of β-IAA, which ensured high growth rates and did not require frequent subcultivation. The high reproduction rate contributed to the obtaining of a significant amount of plant material for further research.

Key words*: culture medium, explant, morphogenesis, rhizogenesis.*

P.I.3. TRENDS ON THE RESEARCH REGARDING INCREASING OF RESISTANCE IN COMMON BEAN (*PHASEOLUS VULGARIS* L.) CULTIVARS

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Abstract

The common bean (Phaseolus vulgaris L.), an annual herbaceous plant belonging to the leguminous family, have been long time cultivating throughout Romania and around the world, for their nutritional and economic benefits. Consequently, numerous researches are dedicated to this species and one of the primary study goals for national and international vegetable institutes are their diversity in biological elements and their unique traits. The latest climatic changes have different impacts on the common bean cultivars growing, that overall proved a good resistance to these phenomena. However, the new strategies that increase resistance to diseases and pests are still needed to be developed in light of the recent challenging and fluctuating climate conditions as well as the emergence of new diseases and pests. One of the main directions of the improving of resistance of the common bean is the breeding technique that include bulk-pedigree, pedigree, and backcross. Studies on the Phaseolus vulgaris lines have revealed greater levels of N, Fe, and Ca in the seeds, which will eventually contribute to better nutritional quality and pest and disease resistance.

Key words*: advancement, diversity, flexibility, resilience, Phaseolus vulgaris L. var. Communis.*

SUBSECTION II: FOOD BIOTECHNOLOGY

P.II.1. IMPACT OF HEAT TREATMENTS ON THE ANTIOXIDANT ACTIVITY AND TOTAL PHENOLIC CONTENT OF SWEET CHESTNUTS (*CASTANEA SATIVA* MILL.)

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Abstract

Sweet chestnuts are highly regarded and widely consumed throughout Europe because of their nutritional composition and health benefits, which have become important in the human diet, for example, in gluten-free diets. This study aims to assess the impact of heat treatment using the UV-VIS spectrophotometry methods. TPC values (mg GAE/g DW - dried weight) ranged from 1.935 to 6.165 (raw flesh), 1.676 to 4.342 (boiled samples), 1.580 to 3.091 (roasted samples), 1.193 to 8.272 (microwaved samples), and 2.556 to 5.655 (steamed samples). The DPPH values (µmol TE/g DW) for raw flesh ranged from 4.232 to 5.094, for boiled samples from 3.396 to 5.147, for roasted samples from 3.185 to 4.726, for microwaved samples from 2.798 to 5.816, and for steamed samples from 4.441 to 5.171. The FRAP antioxidant activity (µmol TE/g DW) values ranged from 10.971 to 207.11 (raw flesh), 4.058 to 134.651 (boiled samples), 11.954 to 132.476 (roasted samples), 7.795 to 179.129 (microwaved samples), and 17.468 to 367.957 (steamed samples). Among the methods used, steaming and microwaving had the greatest impact on total polyphenol content and antioxidant activity (DPPH, FRAP).

Key words*: DPPH, FRAP, heat treatments, polyphenols, sweet chestnuts.*

P.II.2. THE EFFECT OF THERMAL PROCESSING ON ANTIOXIDANT ACTIVITY AND TOTAL POLYPHENOLS IN JERUSALEM ARTICHOKE (*HELIANTHUS TUBEROSUS* L.)

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Abstract

The Jerusalem artichoke (Helianthus tuberosus L.) is high in protein, inulin, and other bioactive ingredients. In this study, the effect of heat treatment methods as well as the effect of the variety on its total polyphenol content and antioxidant activity were investigated. The total polyphenol content ranged from 0.36 to 0.87 mg GAE.g^{-1} DW in raw flesh and from 0.41 (baking) to 1.01 mg GAE.g^{-1} DW (boiling) in heat-treated tubers. The antioxidant activity (AA) was determined by the methods of DPPH and FRAP. DPPH values ranged from 0.18 to 1.09 (raw flesh), 3.03 to 4.74 (boiled samples), 2.34 to 2.94 (baked samples), 2.88 to 3.22 (microwaved samples), and 2.25 to 6.17 (steamed samples) µmol TE.g^{-1} DW. AA values by the method FRAP ranged from 3.5 to 3.82 (raw flesh), 7.51 to 8.53 (boiled samples), 4.26 to 6.80 (baked samples), 4.98 to 6.72 (microwaved samples), and 4.89 to 8.04 (steamed samples) µmol TE.g^{-1} DW. All studied heat treatment methods had a positive effect on the TPC and AA. Our results confirm the promising potential of artichoke use in functional food preparation.

***Key words**: Jerusalem artichoke, heat treatment, polyphenols, antioxidant activity.*

P.II.3. VALORIZATION OF VEGETAL BY-PRODUCTS IN NEW MATRICES FOR THE IMPROVED FOOD SUSTAINABILITY SYSTEMS

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Abstract

This review paper is based on a bibliographic study of over 70 articles published in the period 2001-2023 and presents the need for the valorization of agro-industrial by-products, a review of the main research directions for the valorization of plant by-products for the purpose of better environmental sustainability, as well as the most used methods of valorization of this nutritionally valuable waste. The recycling of waste in the cascade represents the engine of the circular bioeconomy that supports finding solutions to problems related to the sustainability of the environment, economic, ethical, social. The methods and procedures for valorizing plant waste are diversified depending on the type of waste and aim to develop new sustainable food system on the consumer benefits. Vegetal by-products still contain valuable bioactive compounds such as fibers, vitamins, minerals, which can contribute to obtaining new products with added value and can become good sources of raw materials for the food industry.

Key words*: vegetal by-products, food waste, food sustainability, processing methods, trends and perspectives.*

P.II.4. SUBMERGED CULTIVATION OF SOME SPECIES OF EDIBLE BASIDIOMYCETES FOR THE SIMULTANEOUS BIOSYNTHESIS OF BIOMASS AND LACCASE ENZYME

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Abstract

Five species of edible basidiomycetes - Pleurotus ostreatus, Flammulina filiformis, Ganoderma lucidum, Lentinula edodes, and Polyporus squamosus - were isolated and cultivated as submerged mycelium for the biosynthesis of laccase enzymes and biomass production. The selected mushrooms were grown on different agar media to determine the average growth rate, tested on the Potato Dextrose Agar medium supplemented with guaiacol to determine the laccase enzyme index, and then grown submerged in a rotary incubator, in Erlenmeyer flasks. The development of these species was studied in a medium with sugarcane molasses and mineral salts. The dry biomass of the culture media was determined, and the laccase activity was analysed in the filtrate.

Key words*: basidiomycetes, laccase, biomass.*

P.II.5. NUTRITIONAL COMPOSITION OF BEE PRODUCTS AND CURRENT TRENDS ON THEIR PROCESSING

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Abstract

In present times, natural bioactive substances are of great interest, especially appreciated by consumers whose preferences tend towards functional local foods. Among the most well-known natural resources are beehive products, recognized for their beneficial effects on the human body. This article aims to highlight current studies on the nutritional composition of various bee products, including honey, beeswax, propolis, bee pollen, royal jelly, and bee venom. In the same time, current trends in exploiting beehive products indicate a continuous search for ways to enhance their utilization. Through innovative methods such as extractions, fermentations, and ingredient combinations, new horizons are being explored regarding the nutritional benefits and applications of these products. The present work outlines the review of processing methods applied for enhancing utilization of bee products emphasizing the effects of their consumption on health and their potential applications in the food and pharmaceutical industries.

Key words*: bee products, nutritional composition, processing.*

P.II.6. QUALITY EVALUATION OF SOME COMMERCIAL HONEY SAMPLES

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Abstract

Honey is one of the most valuable natural product used for thousands of years in human nutrition. The quality of honey must be controlled analytically with the aim of preserving the consumer from commercial speculation. The values of the physicochemical parameters for ten commercial honey samples attest that all samples appeared to conform to the European Legislation. However, food products such as honey are easily adulterated both in domestic and foreign trade. An alternate analytical technique used to detect adulterations and authenticity of honey implies both FTIR spectrum screening and multivariate analysis of samples. The spectral data of ten honey samples were acquired in the range of 4000-400 cm^{-1}. Out of them, there were two adulterant materials. A spectral range of 1800 to 650 cm^{-1} was selected in order to achieve a satisfactory cluster discrimination. Based on spectral variations, cluster analysis may also be used to categorize and differentiate between pure and contaminated honey.

Key words*: 5-hydroxymethylfurfural, ATR-FTIR spectroscopy, cluster analysis, multivariate analysis, polyphenols.*

P.II.7. ANTIFUNGAL ACTIVITY OF MICROBIAL STRAINS ISOLATED FROM ROMANIAN SPONTANEOUSLY FERMENTED DAIRY PRODUCTS

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Abstract

Phytopathogenic filamentous fungi are main producers of mycotoxins and contaminants of the grain in silos. Although several yeast and lactic acid bacteria (LAB) species are known to inhibit mycelial growth and production of mycotoxins, the diversity of fungi and the mechanisms of mycotoxin production, impose the development of new bioproducts for protection of crop plants and harvested cereals. The present work focuses on the complex characterization as biocontrol agents of 15 strains belonging to five yeast (Ogataea polymorpha, Pichia kudriavzevii, Candida parapsilosis and Saccharomyces cerevisiae) and, respectively, to eight LAB (Lactobacillus rhamnosus, L. plantarum, L. paracasei, Enterococcus faecalis) species from artisan fermented milk, sour-crème, cheese and yogurt. The mycelial growth inhibition tests against Aspergillus flavus and Aspergillus ochraceus strains, revealed values of mycelial growth inhibition index between 60 and 100%, depending on the culture media used for co-cultivation. The semi-quantitative determination of aflatoxins and ochratoxin A (Thin Layer Chromatography) proved that P. kudriavzevii L3S and SM3, respectively, L. plantarum S2B and E. faecalis U4, also interfered with mycotoxin synthesis. In conclusion, all the tested yeast and LAB strains showed complex antifungal activities representing a promising basis for the development of alternative strategies aimed to prevent fungal contamination of crops.

Key words*: lactic acid bacteria, yeasts, antifungal, mycotoxins, Aspergillus, crops.*

P.II.8. ASSESSMENT OF GRAPES INDIGENOUS MICROBIOME FROM "ȘTEFAN VODĂ" PROTECTED GEOGRAPHICAL INDICATION

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Abstract

The diversity of the yeast microflora significantly contributes to the chemical and sensorial characteristics of wine. Lately, the significance of microbiome of grape berries of different geographical origin and varieties, winemaking practices and climatic conditions has led to the suggestion of the microbial terroir. Under micro winery conditions were studied indigenous flora of Cabernet Sauvignon and Merlot grapes from "Ștefan Vodă" PGI. This study is reflecting that the dynamics of the alcoholic fermentation process presented several peculiarities: the spontaneous fermentation had a latency period of 4 days until the beginning of the active phase, and then presented difficulties in completion, especially at the end of the fermentation. Due to possible early and significant development of Kloeckera apiculata, spontaneous fermentation was accompanied by an increase in volatile acidity. The microscopy of studied samples allowed their visual evaluation and the preventive determination of some morphological characters of the microbiome. An efficient use of the grape microbiome would be the selection and subsequent multiplication to be used for fermentation (starter cultures).

Key words*: authenticity, grape microbiome, indigenous flora, wine.*

P.II.9. CORRELATION OF THE CHEMICAL PARAMETERS WITH THE SENSORIAL PROPERTIES OF WINE

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Abstract

Wine quality is afforded by chemical properties but also tightly connected to perception of appearance, olfactory and taste properties. In order to assess the most important chemical parameters of wine that are priority for wine consumers, 21 wine samples were studied. This means 3 varieties of bottled wines from 2018 harvest, vinified in dry, medium dry, medium sweet and sweet, from 4 different wine regions and 6 different vineyards from Romania. For assessing the chemical parameters, 9 laboratory analyses were performed (sulphites, total acidity, volatile acidity, pH, alcohol content, anthocyanins, residual sugar, total polyphenols, tannins). Organoleptic analyses were performed according to BLIC test by 26 tasters panel. Using specific attributes, they evaluated the visual aspect, the olfactory properties and the taste and finally a quality overall mark was delivered. The statistical analyses of the correlation between chemical parameters and sensorial characteristics showed the importance of some laboratory determinations on the perception of wine quality by a common consumer. But the results revealed that very good values of the chemical parameters are not a guarantee of high acceptability of the consumers.

Key words*: wine, sensorial characteristics, chemical parameters, statistical analyses, organoleptic analyses.*

P.II.10. THE CHALLENGES AND ALTERNATIVES OF FOOD SUSTAINABILITY: MEAT ANALOGUES & CULTURED MEAT

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Abstract

The present paper is based on a bibliographic study of over 100 articles published between 2001 and 2023 with general aim of the identification of the most causes that led to the need to replace meat of animal origin with meat analogues and/or cultured meat. The identification of new protein sources and the characterization of the nutritional profile, textural behaviour, sensorial attributes, etc. of meat analogues open new research horizons. The review of the most relevant studies on how to obtain plant-based meat analogues brings to the attention of researchers various pretreatments such as extrusion, hydrogenation, hydrolysis, as well as other technological challenges in improving the quality of plant-based meat analogues. Current research on the new food products development highlights the need regarding the risks and benefits analysis of plant-based and cultured meat analogues, which require in-depth studies in many directions.

Key words*: food sustainability, meat analogues, cultured meat, processing methods.*

P.II.11. FOOD CONTAMINANTS INCIDENCE ON CEREAL VALUE CHAIN: A MINIREVIEW

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Abstract

In order to ensure effective protection of public health, it is mandatory that the level of food contaminants present in the cereal value chain to be below the maximum level established by the regulations in force, and not to be placed on the market or used as ingredients or mixed with other food products if they don't comply with these limits. Cereals can be contaminated through exposure to polluted environment, mycotoxins and heavy metals being a significant source of contamination. These contaminants are considered a public health concern, having an impact on the food security and the economy of many countries, their monitoring being important. There are certain situations in which food is contaminated with mycotoxins and heavy metals, but which can hardly be controlled at all or is only poorly controlled. Therefore, the aim of this review is to offer an update of the incidence of these contaminants on the cereal value chain, the accumulation in the cereal and cereal-based products, the mitigation of these contaminants and the impact on the human health.

Key words*: cereals, contamination, food safety, heavy metals, mycotoxins.*

P.II.12. THE POTENTIAL OF *CANDIDA LIPOLYTICA* ICCF 214 (ATCC 16618) TO PRODUCE BIOSURFACTANS

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Abstract

Biotechnological processes, particularly those involved in biosurfactant production, can pose significant financial challenges. The viability of biosurfactant production hinges on the creation of processes that make use of cost-effective raw materials. This study focuses on exploring the potential of Candida lipolytica ICCF 214 (ATCC 16618) reference strain for biosurfactant production using a mixture of vegetable oil and other chemical compounds used for fermentation medium (1% glutamic acid, urea, or glucose) as carbon sources. Based on the obtained results, we can conclude that all three fermentation media stimulated Candida lipolytica ICCF 214 strain to produce biosurfactants, but further analysis of surface tension and antimicrobial activity of the obtained biosurfactants is required. Additionally, we observed that media with a volume of 100 ml produced higher quantities of biosurfactants, due to the good aeration of the fermentation medium. However, even the ones with 150 ml showed decent performance during the bioprocess.

Key words: *bioemulsifiers, biosurfactants, microbial fermentation, Candida lipolytica, yeasts.*

P.II.13. INNOVATIVE, HIGH-VALUE PLANT-BASED ANALOGUES OF HOT DOG SAUSAGES: ANALYSIS OF RHEOLOGICAL AND TEXTURAL PROPERTIES AND PROTON MOLECULAR DYNAMICS

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Abstract

The market for plant alternatives to meat products is growing every year. However, developing a full-value plant-based product poses many challenges both due to the need to use unconventional raw materials and technologies, but also due to the need to obtain appropriate characteristics of the final products. The rheological properties and molecular dynamics of the obtained batter were characterized using the low-field NMR method, as well as the rheological properties, texture and molecular dynamics of the formed sausages. It was found that the mixtures of plant proteins used, as well as the various sources of iron used, significantly affect the mechanical properties, but also the binding and behavior of water. Nevertheless, it is possible to obtain plant-based sausages with high nutritional value while obtaining the desired mechanical properties. *The National Centre for Research and Development of Poland (NCBR) is acknowledged for funding provided within the programme LIDER under grant agreement No. LIDER/27/0105/L-11/19/NCBR/2020 (PI: Przemysław Kowalczewski).*

Key words*: plant-based meat analogues, mechanical properties, food physics, structure, water behavior.*

P.II.14. NUTRITIONAL VALUE AND BIOLOGICAL ACTIVITY OF A PLANT-BASED BURGER ANALOGUE: *IN VITRO* STUDY BEFORE AND AFTER THE DIGESTION PROCESS

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Abstract

Plant analogues of meat can provide much more compounds than just basic macronutrients. The developed burger analogue is characterized by high nutritional value, but also provides phytocomponents with health-promoting effects. Various protein base mixtures, appropriately composed oil blends characterized by a favorable n6/n3 fatty acid ratio, as well as an innovative source of iron in the form of plant ferritin were used to obtain plant-based burgers. Both raw burgers and those subjected to simulated digestion in the gastrointestinal tract were analyzed. The effect on intestinal microflora, antioxidant and b-glucuronidase activity, as well as cytotoxicity was assessed. It has been shown that plant burgers can stimulate the development of beneficial microflora and also prevent gastrointestinal diseases. They can therefore be used

in diet therapy and the prevention of lifestyle diseases. The National Centre for Research and Development of Poland (NCBR) is acknowledged for funding provided within the programme LIDER under grant agreement No. LIDER/27/0105/L-11/19/NCBR/2020 (PI: Przemysław Kowalczewski).

***Key words**: amino acid profile, digestibility, gut microbiome, in vitro digestion, cytotoxicity.*

P.II.15. EVALUATION OF SOURDOUGHS PREPARED IN DIFFERENT CONDITIONS USING SPONTANEOUS FERMENTATION TECHNIQUE

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Abstract

The aim of this study was to evaluate the suitability of different flours (corn, Einkorn wheat, whole wheat flour) to produce spontaneously fermented sourdough. Sourdough type I was obtained by different ratio of flour: water, different mixture of flours and different fermentation temperatures (25°C and 35°C). The sourdough was evaluated for their pH, TTA and microbial populations (LAB and yeast) for 96 hours with three backslopping stages. Evaluation of pH until it reached a value of 4.3 allowed to discover the optimal fermentation period for each of the two temperatures tested. It was observed that samples fermented at 35°C reached a pH of 4.2 after 24 hours, while samples at 25°C took 48 hours to reach a pH of 4.1. The ideal fermentation time for the population of LAB and yeasts is 72 hours at 25°C, and the most productive sourdoughs were Einkorn wheat flour and 1:1 combination of rye and corn flours. Flour: water ratio 1:1 is recommended to obtain high quality sourdough with a better smell, with a high yield, easy to handle.

Key words*: sourdough starter spontaneous fermentation technological factors LAB yeast.*

P.II.16. INNOVATIVE TECHNOLOGIES FOR REDUCING FOOD LOSS IN THE SEAFOOD INDUSTRY

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Abstract

This study aims to explain innovative technologies such as High-Pressure Processing (HPP), Modified Atmosphere Packaging (MAP), and Nanotechnology within the seafood industry to minimize food loss. It determines the effects of these technologies on extending shelf life, increasing food safety, and sustainability. The study highlights the economic and environmental advantages, challenges, and expenses of these innovations, providing insights into how widespread adoption can positively impact sustainable food production and consumption in the seafood sector. Additionally, these technologies could significantly reduce food waste, lower energy consumption, and minimize carbon footprints. Adopting these technologies could enhance efficiency in the supply chain and reduce environmental impact while maintaining the quality of seafood products. The industry faces challenges in using these innovations, such as high initial costs, operational complexity, and consumer acceptance. In summary, this study presents that adopting advanced technologies in the seafood industry offers significant opportunities for sustainability, economic benefits, and food safety. These technologies can transform current practices in the sector and provide a more sustainable food source for future generations.

Key words*: high-pressure processing, modified atmosphere packaging, nanotechnology, food safety, sustainability.*

P.II.17. THE INFLUENCE OF STARTER CULTURES OF LACTIC ACID BACTERIA ON FERMENTATION OF WHITE CABBAGE

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Abstract

The current investigation delineates the impact of lactic acid bacteria starter cultures of two collection strains - L. plantarum IC12353 (Lpl) and L. paracasei CCM1837 (Lpa) - and two new isolates - L. plantarum P35 (LAB35) and L. brevis P43 (LAB43) - on the cabbage fermentation process. The content of bioactive compounds, antioxidant activity as well as the colony-forming unit counts were assessed in fermented cabbage samples. The analyzed samples revealed noteworthy quantities of phenolic compounds, ranging from 16.91 to 30.71 mg gallic acid equivalents/100 grams of fresh sample, with the highest values for LAB35 and LAB43, while Lpl had the lowest content of polyphenolics. Moreover, the vitamin C content ranged between 50.82 and 60.35 mg ascorbic acid/100 g, while DPPH values varied from 245.80 to 444.42 µmol Trolox equivalent/100 g. The observed variations in the data on bioactive compounds and antioxidant activity can be attributed to the specific lactic acid bacteria strain used in the cabbage fermentation process. This highlights the importance of microbial strains in determining antioxidant properties of the final fermented product.

Key words*: white cabbage, fermentation, starter cultures, lactic acid bacteria, antioxidant capacity.*

SUBSECTION III: MEDICAL AND PHARMACEUTICAL BIOTECHNOLOGY

P.III.1. ANTIOXIDANT AND ANTIPROLIFERATIVE ACTIVITY OF SMALL PEPTIDES ISOLATED FROM MARINE ALGAE BY GREEN METHODS

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Abstract

This study aimed to investigate new green methods based on combined ultrasound- and enzyme-assisted technologies to isolate bioactive peptides from Cladophora vagabunda green macroalga. Also, their antioxidant and antiproliferative activity was analysed in view of biomedical applications. Algal powder was sonicated in alkaline buffer, pH 8, at 37°C, for 1 h. The extract was treated with proteinase K and alcalase, respectively, to obtain two protein hydrolysates. Each hydrolysate was fractionated by centrifugal ultrafiltration using filter membranes with molecular weight cut-off (MWCO) at 3 kDa, to separate small peptides. The fractions were analyzed for Trolox Equivalent Antioxidant Capacity (TEAC). The results showed higher capacity of hydrolysates obtained by alcalase treatment to scavenge free radicals. Additionally, the antiproliferative activity was evaluated in HT-29 tumor cells cultivated in the presence of peptides obtained by alcalase treatment and the results showed a decrease of cell viability below 70% after 48 h of cultivation. In conclusion, peptide fractions isolated by green techniques from C. vagabunda alga had significant biological activity and are recommended for further testing as therapeutic agents.

Key words*: algal peptides, Cladophora vagabunda, enzymatic hydrolysis, marine bioactive compounds, sonication.*

P.III.2. MICROSCOPIC CHARACTERISTICS OF RHIZOMES OF *CURCUMA LONGA* AND *ZINGIBER OFFICINALE* (ZINGIBERACEAE) – A SELECTION OF LIGHT MICROSCOPY IMAGES

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Abstract

The Zingiberaceae, the ginger family, is a family of monocotyledonous herbaceous plants with creeping horizontal or tuberous rhizomes. The plants are aromatic, characterized by the presence of volatile oils and oleoresins. The Zingiberaceae are especially abundant in Southeast Asia and they have been widely used as spices, ornamental, or medicinal plants. The most important commercial spices in the family are ginger (Zingiber officinale), turmeric (Curcuma longa), green cardamom (Elettaria cardamomum) and black cardamom (Amomum subulatum), that also have a great number of health properties. Due to their use in the food and pharmaceutical industries, the microscopic analysis and other parameters of the whole rhizomes/powder of turmeric and ginger provide valuable information in the identification of the plant material, followed by biochemical analysis. In the current study, a microscopic analysis of ginger and turmeric rhizome was carried out to record some of the parameters of taxonomic relevance using a simple method.

Key words*: ginger, light microscopy, microscopic images, rhizome, turmeric.*

P.III.3. PURIFICATION AND CHARACTERIZATION OF EXTRACELLULAR VESICLES FROM THE EDIBLE MUSHROOM *PLEUROTUS ERYNGII*

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Abstract

Interest in extracellular vesicles derived from plants has increased in recent years. In vitro and in vivo experiments revealed that EVs can exhibit anti-inflammatory and anticancer effects and play an important role in cell-cell communication. On mushroom-derived EVs few studies have been conducted. Among edible mushrooms, Pleurotus eryngii produces a wide array of secondary metabolites including biologically active compounds. The aim of this work is to evaluate if edible fungi also produce EVs and if these vesicles have cytotoxic effects on cells. The Extracellular Vesicles from the fruiting body and mycelium of the edible mushroom P. eryngii were purified through ultracentrifugation and Density Gradient Centrifugation. Mushroom EVs (MEVs) were characterized by SEM and Nano-Particle Tracking Analysis (NTA). The cytotoxicity of MEV was tested through the MTT Assay on THP-1 cell line. The results show that MEVs purified from the mycelium of P. eryngii produce extracellular vesicles. Cytotoxicity tests show that MEVs purified from the fruiting body and mycelium behave differently. This suggests further investigation to clarify if even at the level of other properties these vesicles have different behaviors.

Key words*: extracellular vesicles, mushroom, biological properties.*

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P.III.4. PLANT DERIVED EXTRACELLULAR VESICLES WITH ANTI-INFLAMMATORY AND ANTIOXIDANT ACTIVITY FROM *CAPPARIS SPINOSA* AND *ROSA CANINA*

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Abstract

Extracellular vesicles (EVs) have emerged as potent mediators of intercellular communication, playing crucial roles in various physiological processes. Plant-derived extracellular vesicles (PDEVs) exhibit unique characteristics, offering a promising alternative to conventional delivery systems in biomedicine. The intriguing aspect of PDEVs lies in their natural biocompatibility, low immunogenicity, and ability to traverse biological barriers, making them attractive candidates for drug delivery, diagnostics, and therapeutic interventions. PDEVs have recently emerged as promising inflammatory agents. These properties are mainly due to metabolites such as polyphenols and carotenoids, which are transported and protected from degradation by PDEVs. This work aimed to test the anti-inflammatory and antioxidant activity of EVs obtained from Capparis spinosa fruit and Rosa canina berries on cellular models of inflammation. In particular, the anti-inflammatory mechanisms employed by PDEVs, including the suppression of pro-inflammatory cytokine release and the attenuation of oxidative stress, were tested. In conclusion, this work underscores the exciting potential of PDEVs as natural agents with inherent anti-inflammatory activity. The unique attributes of PDEVs position them as versatile tools for targeted drug delivery and as modulators of inflammatory pathways.

Key words*: extracellular vescicles, plants, antioxidant activity, anti-infiammatory activity, capper, Rosa canina.*

SUBSECTION IV: ENVIRONMENTAL BIOTECHNOLOGY

P.IV.1. BIOSURFACTANT PRODUCTION BY *PSEUDOMONAS FLUORESCENS* STRAIN

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Abstract

Biosurfactants are surface-active compounds synthesized by microorganisms as secondary metabolites with important applications in medicine, cosmetics, food, oil, agriculture, and the pharmaceutical industries. In the present study, the Pseudomonas fluorescens ICCF 392 strain was screened to determine its ability to produce extracellular biosurfactants. The strain was cultivated on M44 liquid medium (5% (v/v) glycerol as a carbon source) and also, on M44 modified medium (by replacing the glycerol as a carbon source with 5% (v/v) waste cooking oil). The supernatants obtained at the end of the bioprocesses were evaluated, to confirm the ability of the strain in biosurfactant production, using the drop collaps method, oil spreading technique, and emulsification activity determination (E_{24}). The best results were obtained in the case of the M44 liquid medium. The partially purified bioactive compounds were analyzed by the TLC method, which indicated the nature of the biosurfactants produced as rhamnolipids. Therefore, our results showed that the Pseudomonas fluorescens ICCF 392 strain was efficient in biosurfactant production, using glycerol or waste cooking oil as carbon sources in the biosynthesis process.

Key words*: Pseudomonas fluorescens, rhamnolipids, glycerol, waste cooking oil, submerged fermentation.*

P.IV.2. EXPLORING CURRENT FRONTIERS OF ENVIRONMENTAL CHALLENGES BY BIOINDICATORS AND BIOMARKERS

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Abstract

Anthropic pressure on the environment threaten its biodiversity and subsequently, its sustainability. Nowadays, the research focusses on the development of a new efficient screenings regarding contaminants toxic impact on aquatic and terrestrial environments based on specific biological models, as bioindicators. Cellular and molecular biomarkers are considered to appear very fast under a pollution or climate change stress, before any significant changes at the organism level, and to be specific and sensitive indicators of environmental quality and adaptation mechanisms. Changes at the molecular level could provide rapid information and prediction patterns regarding the occurrence of lethal, sub-lethal, or adaptive effects on biotopes under the influence of anthropogenic stressors. The combined use of bioindicators and biomarkers could provide a comprehensive picture of aquatic and terrestrial ecosystems health status and they could facilitate to identify the environmental issues. In this review, we aimed to establish a relationship between pollution and specific adaptation mechanism responses at the molecular level such as biomarkers. Moreover, we analyzed how biomarkers respond to exposure to different toxic substances and exposure levels, determining dose-response relationships, and biomarker response time.

Key words*: bioindicators, biomarkers, ecotoxicity, biodiversity, anthropogenic stress.*

P.IV.3. CLASSIFICATION AND INDUSTRIAL APPLICATIONS OF BIOSURFACTANTS - MINIREVIEW

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Abstract

A well-developed industrial sector based on biotechnology will significantly reduce dependence on chemical resources, contributing to climate change objectives and leading to a greener and more environmentally friendly growth. The key lies in developing new technologies for the sustainable transformation of renewable natural resources into bio-based products and biofuels. Bioeconomy involves the production of renewable biological resources and their conversion into food, feed, and bio-based products through innovative and efficient technologies provided by industrial biotechnology. This paper presents a general classification of biosurfactants used in industrial applications. The term "surfactant" is derived from "surface-active agent". Biosurfactants have become increasingly significant across various fields owing to their diverse properties, including enhanced biodegradability and reduced toxicity. They are categorized into high and low molecular weight molecules. Biosurfactants find applications in industries such as cosmetics, food processing, pharmaceuticals, and environmental bioremediation. While numerous surfactants are already in use in various industries, it's essential to develop indigenous technologies for the production of biosurfactants from local micro-organism. This would ensure their suitability for application in specific environments.

Key words: *bioremediation, biosurfactants, emulsifiers,* ***i****ndustry, microorganisms.*

P.IV.4. ISOLATION OF MICROORGANISMS TO ENHANCE THE DIGESTIBILITY OF ORGANIC SUBSTRATE FOR BIOGAS PRODUCTION

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Abstract

Agro-industrial waste is an abundant and renewable resource being an alternative for fossil fuels by production of biogas. This substrate has a high content of organic polymers and other high-mass substances, such as: starch, lignocellulose, proteins, lipids, and other compounds. For the degradation of these compounds, several microorganisms (bacteria and fungi) were isolated from the soil and characterized in terms of enzyme production: amylases, cellulases, laccases, proteases, and lipases. The microorganisms that had the highest enzyme indices were multiplied by cultivation in liquid media in order to highlight the degree of decomposition of the organic matter in the substrate. The aim of the article is to obtain at least 5 microbial strains with high degradative potential that can increase the degree of the substrate degradation through specific hydrolysis reactions of organic compounds.

Key words*: microorganisms, organic substrate, enzyme production.*

P.IV.5. INSIGHT INTO THE HEAVY METAL RESISTANCE OF MICROORGANISMS

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Abstract

Heavy metals are persistent pollutants that exert toxic effects onto all categories of life depending on the concentration of exposure. Conventional remediation methods pose several economic, environmental and health disadvantages. For this reason, the use of microorganisms, algae and plants has become of interest for the removal of pollutants from the environment and long-term restoration. Within the framework of projects PN 23.06.01/2023 and Program 1, Contract no. 15PFE/2021, the present work was focused on observing the resistance of bacteria and fungi isolated from heavy metal contaminated soil to Cr, Pb and Zn. The minimum inhibitory concentration, effect of heavy metals on growth and tolerance index were analysed in liquid and solid media amended with concentrations up to 1000 mg/ L of metallic salts. The results indicated that fungi displayed overall higher tolerance to the three metals tested, in the following order: Pb>Zn>Cr, therefore representing viable candidates for future bioremediation purposes. Their heavy metal removal abilities will be further studied and combined with other biological remediation methods for efficient, environmentally-friendly control of pollution in various environments.

Key words*: soil bioremediation, heavy metals, microorganisms.*

P.IV.6. EXTRACELLULAR BIOSYNTHESIS OF BACTERICIDAL SILVER NANOPARTICLES BY FUNGAL STRAINS

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Abstract

Metal nanoparticles have exceptional qualities, as thermal and electrical conductivity, high reactivity, and increased ratio surface volume that recommend for various applications. The biological synthesis of nanoparticles become most attractive by reducing energy and resource consumption, offering a low cost, simple and eco-friendly method. Within the framework of projects PN 23.06.01.01 and PN-III-P2-2.1-PED-2021-1942, the present investigation was focused on the extracellular biosynthesis of silver nanoparticles (AgNPs) under optimal conditions in temperature, and pH. Accordingly, several fungal strains belonging to Aspergillus, Trichoderma, Penicillium, and Cladosporium genera were tested for the capability to synthesis nanoparticles. The formation of AgNPs was demonstrated by colour changing from yellow to brownish during the contact between mycelium extracts and silver nitrate solution, the robust surface plasmon response in UV-VIS spectra (within range of 400-430 nm), and Scanning Electron Microscopy observations. The antibacterial activity of AgNPs was tested against a panel of pathogens (Pseudomonas aeruginosa, Escherichia coli, and Staphylococcus aureus) and the best performing strain was selected for further investigations.

Key words*: extracellular biosynthesis, silver nanoparticles, antibacterial.*

P.IV.7. THE BIOTECHNOLOGICAL POTENTIAL USES OF *VITIS VINIFERA* SEED WASTES

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Abstract

The purpose of this study was to evaluate the antibacterial activity of four types of Vitis vinifera seed oils, including three commercial oils and one derived from vermicomposted seeds, against 24 strains of pathogenic microorganisms, including pathogenic bacteria strains such as Escherichia coli, Staphylococcus aureus, Staphylococcus epidermidis, Bacillus cereus, Listeria monocytogenes, Serratia marcescens and pathogenic yeast strains such as Candida albicans, Candida glabrata, Candida tropicalis and Candida parapsilosis, as well as their antioxidant activity using DPPH and ABTS. The fatty acid profile was also examined using chromatographic techniques. The results showed that all of the tested oils had significant antibacterial activity. In addition, the oil obtained from vermicomposted seeds showed superior antioxidant activity compared to the three commercial oils, accompanied by an optimal fatty acid profile. These findings imply that this oil has the potential to be used in the food and pharmaceutical industries, with significant health benefits and prospective applications in the food sector.

Key words*: grape seeds oil, vermicomposting.*

P.IV.8. LIPOLYTIC AND CUTINOLYTIC ACTIVITY OF MICROORGANISMS ISOLATED FROM POLYETHYLENE SURFACE

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Abstract

Among the most known enzymes used for plastic degradation are esterase, cutinase, and lipase. These enzymes are synthesized by a wide range of microorganisms from different species. The research aimed to estimate lipolytic and cutinolytic activity of microorganisms isolated from the surface of low-density polyethylene (LDPE) films, using three rapid screening methods. The rapid tests used in this research are based on the addition to the culture medium of tributyrin, triacetin and flaxseed oil as inducers, and dyes as indicators of enzymes synthesis. The microorganisms included filamentous fungi and yeasts, pseudomonads and actinobacteria. Among 21 isolated strains of fungi, 90% strains possessed lipase activity, 29% exhibited high lipolytic activity. Only 57% of fungal isolates showed cutinase activity. Both extracellular enzymes were recorded for 43% of yeasts isolates. Lipolytic activity exhibited 83% of the tested strains of Pseudomonas spp., and 50% of Streptomyces spp., while cutinolytic activity only 33% of bacterial isolates. Both lipase and cutinase were produced by 41% of the total number of tested microorganisms. The ability to produce these extracellular hydrolytic enzymes indicates the possibility to metabolize polymers, such as polyethylene.

Key words*: fungi, yeasts, bacteria, lipase activity, cutinase activity, polyethylene, LDPE.*

SUBSECTION V: MISCELLANEOUS

P.V.1. SCREENING OF MICROBIAL STRAINS ABLE TO PRODUCE EXTRACELLULAR LIPASES

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Abstract

Lipases have gained attention worldwide, due to their potential for diverse applications and their stability and selectivity. The study's aim was to identify microorganisms with the ability to synthesize extracellular lipase. In order to achieve this, 20 microbial strains were cultivated on selective solid agar media and lipase producing microorganisms were selected based upon their ratio of the diameter of the halo (if present) and the colony's diameter. The bacterial strains were cultivated on three different selective media, the results indicating that the best screening medium was TBA and the strain that was estimated to have the highest lipase activity was Bacillus subtilis ICCF 20. Yeast strains were cultivated on two selective media and M4D was selected as the best screening medium. The highest producer of lipases was considered to be Yarrowia lipolytica ATCC 16618 ICCF 214. The fungal strains were cultivated on two selective media and the best screening medium was determined to be YS. Two fungal strains were selected as having the highest lipase activity: Aspergillus niger (P4 C36) ICCF 24 and Aspergillus awamory (P2 C114) ICCF 259.

Key words*: lipase, screening, bacteria, yeast, fungi.*

P.V.2. HORSERADISH, A RESERVOIR OF USEFUL BIOACTIVE COMPOUNDS

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Abstract

Horseradish (Armoracia rusticana) is a plant of the Brassicaceae family, known for its strongly aromatic and spicy root. Horseradish, like many other root vegetables, is rich in biologically active compounds with antibacterial, anti-inflammatory, antioxidant and anticarcinogenic properties. The composition of the biologically active compounds of horseradish varies depending on the species of horseradish and the environmental conditions in which it is grown. The aim of this work was to determine the composition of some bioactive compounds from horseradish roots and leaves from the Romania and central part of Serbia. The elemental composition was determined by the XRF method, it being known that many mineral elements and trace elements are essential for the normal functioning of human bodies, reducing the risk of chronic diseases. The compounds with antioxidant activity from plant matrices are known as protectors of cells against oxidative stress, with a role in supporting the immune system. Consequently, the total content of polyphenols and antioxidant activity were determined from horseradish extracts by spectrophotometric methods. The results obtained recommend the tested horseradish as a beneficial food for health.

Key words*: horseradish, bioactive compounds, elemental composition, antioxidant capacity.*

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