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International Experts Summit on

Food Science and Technology

SEPTEMBER 04-06, 2023

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About IESFT 2023

We are pleased to invite all researchers, young scholars, delegates, experts and students from all over the world to attend the International Experts Summit on Food Science and Technology (IESFT2023) will be held in Tokyo, Japan, during September 04-06, 2023.

IESFT2023 provides a platform of international standards where you can discuss and share knowledge on Food Science and Technology to bring a unique forum for exchanging the information regarding the latest developments, finding solutions and enriching the knowledge. In addition to Presentations, Workshops, and Discussions, the conference also offers a unique venue for renewing professional relationships, and providing plenty of networking opportunities during the summit.

We're looking forward to Meghaz meetings with researchers from different countries around the globe for sharing innovative and great results in Food Science and Technology.

Committees

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Abstracts Plenary

Plants for Healthy Longevity

Dr Prakash Kondekar
Fellow of Royal Society of Health, London

Abstract
Pandemic Covid 19 has taught us many things during last two years. One of that is use of Plants for our health. Human body contents Plasma which carries substances like hormones, vitamins, amino acid & antibodies & also contains proteins called clotting factors that help the blood to coagulate. Balance of Saliva, Mucus & cerebrospinal fluids, is important for overall health of a person. Nature plays a major role in Human Health through various plants. Stress has been shown to increase clinical viral respiratory illness in humans. Immunity changes are associated with distress can contribute to the etiology and course of immunologically resisted diseases, such as infections, autoimmune diseases or cancer. So we will see how plants are associated with our health.

The earliest land plants date back to around 3.70 billion years before. Estimates on the number of Earth's current species range from 10 million to 14 million. They have major impact on Mankind. The impact of the Moon and its rotation around the Earth has many effects on life on the Earth and Mankind. Earth Science taught the Mankind, how to take care of the Nature and obtain the benefits of the atmosphere through plants so as to have a smooth life and healthy longevity.

Biography
Dr. Prakash Kondekar has completed MD (Homoeo) in 1964, BSc (Hons) LLB Doctor of Naturopathy, 1992, Ayurved Ratna FRSH (London) Bowtech (UK). He has been Hon Director-Indian Institute of Naturopathy since 1996. He has published 30 papers-in-medical journals. Visiting Faculty, Mumbai University. Since 2011, invited by AICR Washington DC 2003. INDIA-VIETNAM INVESTMENT ENGAGEMENT Ho-Chi-Minh City-2013, GFSI Barcelona, Spain. St Cloud University Minneapolis-Food Microbiology, 2013, Vienna Energy Forum 2015, Indian-Embassy-ROME 2016. Invited by National University of Natural Medicines-Portland, Bastyr University-Kenmore, AM Commerce, and North Texas, University, 2018. Purdue University in 2019. Conducted 450 Health Management Programmes India and 20+ in UK, USA, Germany, Mauritius, Vietnam, UAE, Austria, Abu Dhabi, Spain, Singapore.

Lifestyle Medicine, Technology and Diet

David John Wortley
ISDM, Alderton, UK

Abstract
Lifestyle Medicine is a fast-growing discipline that seeks to address some of the key challenges of the Ageing Society. Food and Nutrition play a vital role in preventative healthcare [1] and lifestyle medicine, along with exercise, hydration, sleep, socio-economic situations and relationships. One of the major global health challenges is obesity and its links to clinical chronic conditions such as diabetes 2, cancer and cardiovascular problems.

Preventative healthcare measures should be implemented at as early a stage in life as possible. This presentation looks at how technology can be applied to change behaviours and the role of technology such as mobile applications and wearable devices in tackling these problems.

Keywords
Lifestyle Medicine; Diet; Nutrition; Ageing Society; Epigenetics; Wearables

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Biography
David Wortley is CEO & Founder of 360 in 360 Immersive Experiences and a VP of the International Society of Digital Medicine (ISDM). He is a Fellow of the Royal Society of Arts and Commerce and a global thought leader and innovator on enabling technologies for health, education and the environment. He is on the editorial board of the Digital Medicine Journal. He is an Associate Member of the Royal Society of Medicine and a Visiting Fellow at the Faculty of Health and Social Sciences at Bournemouth University

Abstracts Keynote

Recent Advances in Electrochemical and Optical Based Biosensors for the Detection of Aflatoxin B1 in Food Products; A Mini Review

Reza Abedi-Firoozjaha, Neshat Ahmadib

[1]Student Research Committee, Department of Food Science and Technology, School of Nutrition Sciences and Food Technology, Kermanshah University of Medical Sciences, Kermanshah, Iran
[2]PhD student, Department of Food Science and Technology, Islamic Azad University of Tabriz, Tabriz, Iran.

Abstract
Aflatoxin B1 is one of the most potent mycotoxins that contaminates several foods and feeds. It suppresses the immune system, leading to mutagenicity, carcinogenicity, teratogenicity, hepatic toxicity, embryotoxicity, and increased morbidity and mortality. Continuous exposure to aflatoxin B1 causes liver damage and consequently increases the prevalence of cirrhosis and liver cancer. Traditional analytical methods are sensitive and specific but are not suitable for rapid and on-site detection. Therefore, simple, sensitive, and rapid analytical methods are required. As a result, the development of electrochemical and optical sensors represents significant progress in aflatoxin B1 detection. These sensors offer a simple, fast, and cost-effective approach for detecting aflatoxin B1 in various samples such as food samples. The high sensitivity and selectivity of these sensors, coupled with their ability to detect aflatoxin B1, make them an attractive alternative to traditional detection methods. Scientists in this field have improved the design of several new signal transduction schemes, as well as enhanced the sensitivity and performance of sensors. This brief review discussed the toxicity of aflatoxin, its prevalence in various foodstuffs, common diagnostic methods in food materials, and ultimately electrochemical and optical methods, their advantages, challenges, and future prospects in the food industry. Some of these methods are likely to be available in the market in the near future. By focusing on improving the performance of receptor-based sensors and integrating them into portable devices, there is a hopeful future for the use of these sensors in various fields, including food safety, environmental monitoring, and healthcare. However, there are limitations with nanomaterials regarding their intrinsic properties and difficulties in biological chemistry, which may result in inefficient electrochemical and optical sensors. To overcome these issues, improvements in existing approaches and the search for new nanomaterial s with high efficiency are necessary. The development of field measurements poses another challenge that requires further attention.

Keywords
Aflatoxin B1; Electrochemical and Optical Sensor; Nanomaterials; Detection Methods

The Content of Bioactive Compounds in Broccoli Microgreens Depending on Growing Temperature

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[1] *Department of Biology, Faculty of Science, University of Zagreb, Zagreb, Croatia*
[2] *Division of Molecular Medicine, Ruđer Bošković Institute, Zagreb, Croatia*
[3] *Institute for Medical Research and Occupational Health, Zagreb, Croatia*

Abstract
Extreme climate conditions are becoming more frequent. Immobile organisms, such as plants, adapt their physiology to the new conditions to survive. The intensity and direction of these changes depend on both the temperature and the plant species. Such changes are usually crucial yield-limiting factors for plants. Broccoli (Brassica oleracea) is rich in vitamins (C, K); β-carotene, a precursor of vitamin A; dietary fibers; polyphenols; fatty acids; minerals and glucosinolates - phytochemicals that are predominantly represented in Brassica vegetables and contribute to their health benefits. High or low environmental temperatures will cause perturbations in these phytochemicals profiles, which might have consequences on the biological effects of a plant and its products. In scope of our work, we investigated the influence of hot- and cold-water stress on the metabolism of broccoli (Brassica oleracea L. convar. botrytis (L.) Alef. var. cymosa Duch.) microgreens with the aim to (i) define the susceptible and resistant parameters of this plant during low- and high-temperature water stress, (ii) determine the degree of metabolism change of broccoli due to these two types of stress, and (iii) determine the degree of change in the biological effects of broccoli extracts due to the types of stress. The results suggest the possibility of using temperature stress to grow broccoli microgreens enriched with compounds of interest to human health and this should be further investigated.

Keywords
Abiotic Stress; Cell Culture; Climate Change; Glucosinolates; Micro- and Macroelements; Phenolics

Biography
Dr. Ivana Šola, Assoc. Prof. works in Laboratory for Phytochemistry at the Department of Biology, Faculty of Science, University of Zagreb. Her main scientific interest is plant specialized metabolism plasticity under different environmental conditions. Currently she is a leader of one international and two national projects, collaborator on two scientific and one infrastructural national project. She is a coauthor of 28 scientific papers, 1 manual, and participated in 69 international congresses. She teaches Fundamentals of Phytochemistry, Plant Anatomy, Plant Bioactive Substances, Plants in Phytotherapy, Molecular Biology of Plants, and leads the Laboratory Professional Practice.

Fibrous Microplastic Pollution in the Aquatic Environment as a Threatening Issue for Seafood and Human Health: Recent Evidence and Research Gaps

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[2] Institute of Polymers, Composites and Biomaterials, National Research Council of Italy, Via Campi Flegrei 34,80078 Pozzuoli, Italy.
[3]Department of Chemical Engineering, Materials, and Industrial Production, University of Naples Federico II, P. Tecchio 80, 80125 Naples, Italy.

Abstract
Microfibers are defined as particles with a diameter less than 50 μm, and a length ranging from 1 μm to 5 mm. Among the different forms of microplastics found in the environment, these particles are predominant in the marine ecosystem [1]. As a result of the extensive use of synthetic textiles and the absence of proper treatment techniques, the seas, and oceans are becoming overburdened with these micropollutants [2]. Once released into the environment, microfibers may be dangerous due to the risk of ingestion by marine species that are part of the food chain. Currently, microfiber exposure has been assessed both in farmed and wild fish species of commercial interest from all over the world [3]. To assess the extent of microfiber contamination in seafood from the Tyrrhenian Sea, a multispecies approach involving exemplars with different habitats and feeding strategies was applied. Microfibers were present in 74% of mussel samples (Mytilus galloprovincialis), with a mean number of 14.57 microfibers/individual, corresponding to 3.13 microfibers/g w.w. [4]. Moreover, the occurrence of microfibers was detected in 53 and 60% of Engraulis encrasicolus and Mullus barbatus, respectively, with a mean of 6.9 microfibers/individual in anchovies, and 9.2 microfibers/individual in Red mullet samples [5]. Mussels, and also small pelagic fish, such as anchovy, are consumed as a whole, leading to human exposure. Considering a portion of mussels and anchovy, we estimated that the consumer may ingest, respectively, 299.25 and 135.6 plastic and natural microfibers [6]. However, those who consume processed seafood may not be able to avoid microfiber pollution effectively as these particles were detected also in the gutted meat of some marine organisms [7]. In this context, there is an urgent need to standardize data collection methods for the detection of microfibers in seafood. Several analytical issues and the considerable limitation of the use of spectroscopy techniques may hamper the analyses of microfibers, which are therefore underestimated in the literature [3]. The effort to implement a quick and easy method in the microfiber study has led to the application of a visual approach, based on the analyses of unique surface morphological traits of textile fibers, as an important initial step in the classification of microfibers to their main groups [4-5]. Despite this approach cannot conclusively identify the origin of the textile fibers, it may successfully place the abundance of synthetic and natural microfibers within the study of microplastic pollution. This information could contribute to the application of mitigation strategies, as well as to the assessment of human health risks through the consumption of contaminated seafood.

Keywords
Microfibers; Seafood Contamination; Human Exposure; Analytical Issues

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Biography
Graduated in Veterinary Medicine (2013), and Ph.D. in Veterinary Science at the University of Naples Federico

II (2017), Dr. S. Santonicola has experience in Food Safety, focusing on food contaminants. She is working at the Department of Medicine and Health Sciences “V. Tiberio” University of Molise, as a researcher in the field of microplastic and microfiber contamination in commercial fish species.

Abstracts Invited

Parametric Optimization for Enhanced Lipid Recovery Using Microalgae (*Chlorella pyrenoidosa*)

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Abstract
In recent times, algal technologies have advanced significantly. Initially, microalgae has garnered attention in the research community as a sustainable energy source for biofuels, due to their ability to rapidly produce large amounts of lipids in a small area. Despite the potential of microalgae as a lipid source, technical and economic obstacles, especially in de-watering and extraction, have hindered the conversion process.To overcome these hurdles, novel technologies like ultrasonication and microwave-assisted extraction have emerged as promising solutions to enhance the efficiency of the process. This study aims to investigate the impact of green technologies namely ultrasonication and microwave treatments and processing parameters optimization for enhance lipid yield from microalgae.
Two-stage cultivation process under standardized growth conditions was employed to grow the microalgae species *Chlorella pyrenoidosa*. The grown biomass from the stationary phase was harvested by centrifugation and then subjected to freeze-drying. The dried microalgae were then pretreated using ultrasonic and microwave techniques. For pretreatment purpose using ultrasonication, designed experiments using Box-Behnken Design having three levels of four influencing parameters i.e.,extraction time (10-30 minutes), amplitude (20-50%), solvent to biomass ratio (60:1 to 100:1 mL/g), and pulse on-off (2 seconds) were conducted to investigate the effect of these parameters on lipid recovery. For the microwave treatment, extraction temperature (60-90), extraction time (10-30 minutes), and holding time (5-15 minutes) were studied. Besides, soxhlet extraction was also carried out using n-hexane solvent at 50 for 8 hours.
The data analysis showed that pretreatment, particularly ultrasonication, significantly increased lipid yield. Ultrasonic and microwave treatment resulted in oil yields ranging from 7.96% to 35% and 5.77% to 17.05%, respectively. Microwave treatment led to higher oil yields with increasing extraction temperature and holding time (Fig.1a). On the other hand, ultrasonication demonstrated that maximum oil yield was achieved with longer extraction times and lower amplitude (Fig.1b).Optimal conditions for lipid extraction using ultrasonication pretreatment were found to be 29 minutes extraction time, 26% amplitude, and 98:1 mL/g solvent-to-biomass ratio.
Statistical analysis revealed that model F- value and p-value were found to be highly significant at 1% and 5% level of significance in the case of lipid yield. Hence quadratic model could be fitted to predict the lipid recovery.
Based on the above, it could be concluded that parametric optimization using novel pretreatment methods especially ultrasonication can open up new possibilities and unlock the doors for sustainable resource utilization. Besides, optimized extraction parameters can enhance lipid recovery which could further be used for the production of omega-3, biofuels and feed etc. This versatility makes microalgae a promising renewable resource with vast potential in the Food processing sector.Top of Form

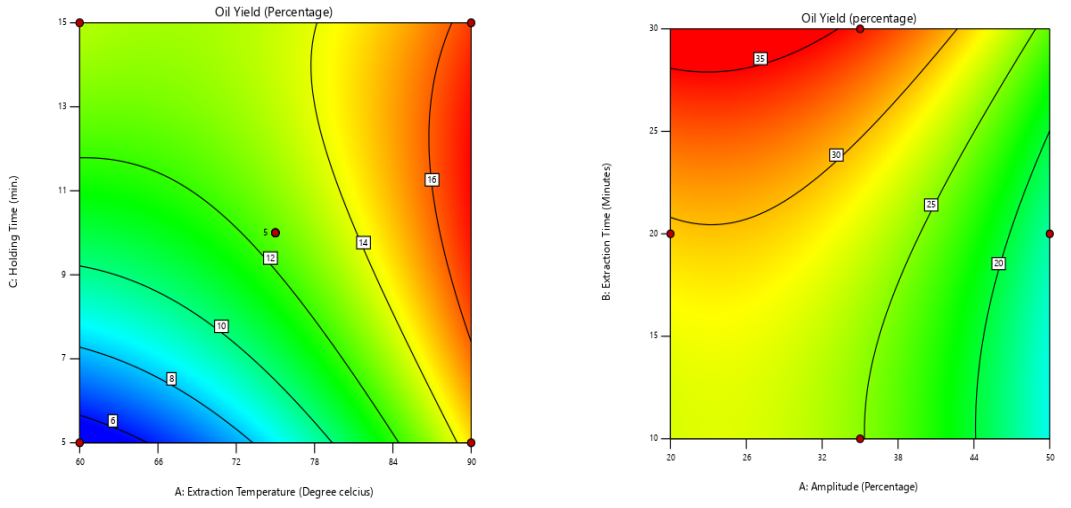
Table 1. ANOVA for Quadratic model (Microwave Treatment)

Source	Sum of Squares	df	Mean Square	F-value	p-value	
Model	170.66	9	18.96	18.51	0.0004	significant
A-Extraction Temperature	76.32	1	76.32	74.52	< 0.0001	
B-Extraction Time	0.0780	1	0.0780	0.0762	0.7905	
C-Holding Time	52.12	1	52.12	50.89	0.0002	
AB	4.56	1	4.56	4.45	0.0728	
AC	10.43	1	10.43	10.19	0.0152	
BC	5.11	1	5.11	4.99	0.0607	
A^2	6.92	1	6.92	6.76	0.0354	

Source	Sum of Squares	df	Mean Square	F-value	p-value	
B^2	7.26	1	7.26	7.08	0.0324	
C^2	8.49	1	8.49	8.29	0.0237	
Residual	7.17	7	1.02			
Lack of Fit	2.68	3	0.8931	0.7956	0.5569	not significant
Pure Error	4.49	4	1.12			
Cor Total	177.82	16				

Table 2. ANOVA for Quadratic model (Ultrasonication Treatment)

Source	Sum of Squares	df	Mean Square	F-value	p-value	
Model	842.69	9	93.63	134.26	< 0.0001	significant
A-Amplitude	531.05	1	531.05	761.48	< 0.0001	
B-Extraction Time	69.38	1	69.38	99.49	< 0.0001	
C-Solvent to Biomass ratio	56.92	1	56.92	81.62	< 0.0001	
AB	0.1406	1	0.1406	0.2016	0.6670	
AC	15.09	1	15.09	21.64	0.0023	
BC	10.73	1	10.73	15.38	0.0057	
A^2	65.92	1	65.92	94.52	< 0.0001	
B^2	23.72	1	23.72	34.01	0.0006	
C^2	76.35	1	76.35	109.48	< 0.0001	
Residual	4.88	7	0.6974			
Lack of Fit	3.95	3	1.32	5.64	0.0639	not significant
Pure Error	0.9329	4	0.2332			
Cor Total	847.57	16				



(a) (b)

Fig.1Contour plot of (a) Extraction temperature and holding time on the lipid yield during microwave process (b) Extraction time and amplitude during ultrasonic process.

Keywords
Chlorella Pyrenoidosa; Microwaves; Ultrasonic; Soxhlet Extraction; Oil Yield

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Biography

Dr. Anupama Singh has over 27 years of academic experience in the agri-food processing sectors. Her research interest includes Bio-waste utilization, Sustainable food processing novel technologies, product development, and value addition.

Dr. Singh has received various accolades, recognitions and fellowships, and awards at the national and international levels, including the prestigious Norman Borlaug Fellowship by USDA/ICAR and the National Fellow Award by ICAR, India.

She has executed multiple R&D and Consultancy projects. She has guided 4 doctoral research, 30 M. Tech. Thesis and many research projects at the graduate level.

She has over 293 publications to her credit including research papers/articles in various peer-reviewed international and national journals, book chapters, technical bulletins, status reports, articles, etc. She has presented more than 100 research papers in various National&International conferences.

After a sterling career, spanning over 25 years, at GB Pant University of Agriculture & Technology, Pantnagar, Professor Anupama Singh is currently Dean, Post Graduate Studies and Head at the Department of Food Engineering, National Institute of Food Technology Entrepreneurship and Management (NIFTEM), India.

A New Generation of Chemically Active Glass for Supplying the Plants with the Primary Nutrients and Microelements

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Abstract
In countries having high-developer agricultural practices, unconventional materials enabling adequate fertilization are more and more often being looked for. Some alternatives in these activities represent glassy mediums characterized by extended operating time and controlled dissolution speed. The chemical composition and the glassy form provide them with limited and controlled solubility in solutions of organic compounds emitted by the root systems of plants. It guarantees the possibility to use them wherever there is a need to supply nutrients in controlled amounts but without the danger of overdosing alongside, additionally.

The main factor determining the possibility of using glass as a fertilizer is its chemical activity in the soil environment. It is determined based on the test of assimilation of nutrients by plants derived from mineral fertilizers and their solubility in a 2wt.% citric acid solution, simulating the natural soil environment. It is an organic acid which, in the presence of non-metals (Si, P), activates the process of dissolving their compounds, usually insoluble or poorly soluble in water. The specific test conditions guarantee the creation of a physio-chemical state similar to the one existing on the line of a plant surrounding soil contact. Accordingly to the above, the chemical activity of glasses with the silicate-phosphate matrix and phosphate-silicate matrix being a medium of microelements in the form of molybdenum, manganese, iron, copper, and zinc ions was determined using a test used in agricultural chemistry.
Research project was supported by program “Excellence initiative – research university” for the AGH University of Science and Technology

Biography
Magdalena Szumera has completed her PhD from AGH UST Faculty of Materials Science and Ceramics. Currently, she holds the position of Associate Professor at her alma mater. So far, she has supervised five doctorates, over 25 master’s theses and 35 engineering theses. She is a member of the Polish Ceramic Society, the Scientific Council of Chemical Engineering, and the Ceramic Sciences Committee of the Polish Academy of Sciences in Krakow. She is also an expert on the Polish Accreditation Committee and the National Agency for Academic Exchange NAWA. Furthermore, she has published more than 89 papers in reputed journals.

Spectroscopic, Theoretical and Biological Investigation of Monoterpenes

Renata Świsłocka[1], Grzegorz Świderski[1], Aleksandra Golonko[2,3], Włodzimierz Lewandowski[1,2]

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[2]Waclaw Dabrowski Institute of Agricultural and Food Biotechnology – State Research Institute Warsaw, Poland
[3]Clinical Research Center, Medical University of Bialystok, Bialystok, Poland

Abstract

Monoterpenes are the main components of essential oils, which contribute to the taste and aroma of the plant. This study investigates the molecular structure of monoterpenes (γ-terpinene, p-cymene and p-cymenene) using an integrated approach of Fourier-transform infrared (FT-IR) and Raman (FT-Raman) spectroscopy, proton (1H) and carbon (13C) nuclear magnetic resonance (NMR) spectroscopy, and density functional theory (DFT) calculations. The B3LYP/6-311+G(d,p) method was employed to calculate the optimized structures, atomic charges, dipole moments, energies, general reactivity descriptors, as well as the wavenumbers and intensities of the vibrational and NMR bands of the investigated compounds. Theoretical parameters were compared to the experimental data, with a focus on the relationship between the spectroscopic data and theoretical parameters of the studied compounds. Additionally, the antioxidant activity of the monoterpenes was assessed using 2,2-diphenyl-1-picrylhydrazyl (DPPH) and ferric reducing antioxidant power (FRAP) assays, and their cytostatic properties were evaluated. The study presents a comprehensive analysis of correlations between the molecular structure and biological activities of the investigated monoterpenes. The aim of this work is also searching for more effective antioxidants important in food science and technology and human nutrition.

Acknowledgement

This work was funded by the National Science Centre, Poland under the research project number 2018/29/B/NZ9/01997.

Biography

Dr hab. Renata ŚWISŁOCKA prof. PB, in 1990 she graduated from the Faculty of Mathematics-Scientific of the University of Warsaw. In 1997, she obtained Ph.D. in technical sciences at the Bialystok University of Technology, and in 2014 the title of post-doctoral degree - chemical sciences at the University Maria Curie-Sklodowska in Lublin. Currently she works as an associate professor at the Department of Chemistry, Biology and Biotechnology at Bialystok University of Technology. She has published 90 papers in reputed journals (H-index = 22, sum of times cited: 1403). Specialization – bioinorganic chemistry, environmental chemistry.

Spectroscopic, Theoretical and Antioxidation Study of Alkali Metal Salts of Hydroxymandelic Acids

Włodzimierz Lewandowski[1], Renata Świsłocka[1], Grzegorz Świderski[1], Marta Wyrwas[1], Justyna Murawska[1], Hanna Lewandowska[2]

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[2]Centre for Radiation Research and Technology Institute of Nuclear Chemistry and Technology 16 Dorodna St., 03-195 Warsaw, Poland

Abstract
The molecular structure and electronic charge distribution of hydroxyderivatives of mandelic acids (4-hydroxy and 3,4-dihydroxymandelic acid) and their complexes with alkali metals (Li, Na, K, Rb, Cs) were investigated. Ligands and metals were selected in the so-called logical series. The tested ligands differ in the number and position of the hydroxyl groups in the aromatic ring, while the metals in the series of lithium caesium differed in the ionic potential. For structural studies, we used vibrational spectroscopy (FT-IR and FT-Raman) and nuclear magnetic resonance (1H, 13C NMR), as well as quantum calculations. The biological (antioxidant) activity of the analyzed series of ligands and their complexes with metals will also be investigated. The following methods were used: DPPH, FRAP. This work is part of a broader topic (grants of the National Science Center no. 2018/29/B/NZ9/01997; 2018/31/B/NZ7/03083; 2020/39/B/NZ9/01894), the purpose of which is systematic research of: (1) the correlation between molecular structures and biological activity, (2) the influence of complexation by different metals in their logical series on the biological activity of ligands, (3) searching for more effective, natural antioxidants important in human nutrition, food science and technology.

Acknowledgement
This work was funded by the National Science Centre, Poland under the research project number 2018/31/B/NZ7/03083.

Biography
Prof. Włodzimierz Wiktor Lewandowski (H-index = 31, sum of times cited: 3093) graduated from the Faculty of Chemistry at the University of Warsaw (1971). He defended his doctoral thesis with honors (1978) and habilitation (1988) at the Faculty of Chemistry of the University of Warsaw. Since 2006, he has been employed as a full professor. Prof. Włodzimierz Lewandowski has extensive experience in the field of bioinorganic chemistry and food chemistry. He is the author/co-author of 339 scientific publications, including 185 on the Philadelphia list, 10 textbooks and monographs.

Lanthanide Complexes with Caffeic and P-Coumaric Acids – Spectroscopic and Antioxidant Study

Grzegorz Świderski[1], Renata Świsłocka[1], Ewelina Gołębiewska[1], Monika Kalinowska[1], Włodzimierz Lewandowski[1,2]

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Abstract
Caffeic (CFA) and p-coumaric (pCA) are hydroxy derivatives of cinnamic acid, characterized by a wide range of health-promoting effects. They are secondary plant metabolites formed from phenylalanine in the pathway of hydroxycinnamic acid synthesis. In fruits, vegetables, cereal grains, wine and coffee, pCA and CFA occur in many forms - monomers, dimers, oligomeric derivatives in a complex form with glycosides, amides, organic esters and other chemical compounds. Plant polyphenols, which include CFA and pCA, have antioxidant and pro-oxidant properties. The structures of lanthanides (europium(III), dysprosium(III), and gadolinium(III)) complexes with pCA and CFA acids were investigated by the use of FTIRKBr, FTIRATR, Raman spectroscopic methods. The composition of the solid phase caffeinates and p-coumarates was done on the basis of hydrogen and carbon amount determined by the use of elemental analysis. The degree of hydration and thermal decomposition of the compounds were examined by thermal analysis of TG, DTG and DSC. The aim of this study is searching for more effective antioxidants important in food science and biotechnology.

Acknowledgement
This work was funded by the National Science Centre, Poland under the research project number 2018/29/B/NZ9/01997.

Biography
In 2005 he graduated from the Faculty of Chemistry at the University of Bialystok (Poland). He defended his doctorate in chemical sciences in 2013 at the University of Bialystok. He obtained his habilitation in chemical sciences in 2022 at the Maria Curie Skłodowska University in Lublin (Poland). He is the author of 45 publications from the JCR list with a total IF=140.

Characterization and Quality Impact of Aloe Vera Gel Coating Enriched with Saba Banana (*Musa acuminata x musa balbisiana*) Essential Oils on Harvested Fruits

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Abstract
This study focused on the characterization and application of Aloe Vera gel coating enriched with leather essential oils derived from Saba Banana (Musa acuminata var musa balbisiana) to improve the quality of fruits after harvest. The researchers aimed to assess the physical and chemical properties of the Aloe Vera gel coating and its impact on fruit quality. The Aloe Vera gel coating was prepared using freshly extracted gel from Aloe barbadensis Mill. leaves, and leather essential oils obtained from Saba Banana were incorporated into the coating. The physical properties of the coating, such as viscosity, color, and adhesion, were evaluated. Additionally, chemical properties including pH, moisture content, and antioxidant activity were analyzed to determine the overall quality of the coating. Ripe Saba Bananas were selected for the study and divided into two groups: one group was coated with the Aloe Vera gel containing leather essential oils, while the other group remained uncoated as a control. The fruits were stored under controlled conditions, and their quality parameters were assessed periodically. These parameters included firmness, color, weight loss, total soluble solids (TSS), titratable acidity (TA), and ascorbic acid content. The results indicated that the Aloe Vera gel coating with leather essential oils had a significant impact on the quality of the Saba Bananas after harvest. The coated fruits exhibited better retention of firmness, reduced weight loss, maintained desirable color, and retained higher levels of TSS, TA, and ascorbic acid compared to the uncoated fruits. Furthermore, the coated fruits showed enhanced antioxidant activity, suggesting potential health benefits. In conclusion, the Aloe Vera gel coating enriched with leather essential oils from Saba Banana demonstrated its potential as a natural and effective method for preserving fruit quality after harvest. The study contributes to the development of sustainable and environmentally friendly post-harvest techniques that can enhance fruit quality and prolong shelf life.

Considering Benefits and Risks of Natural Microbiota of Raw Foods

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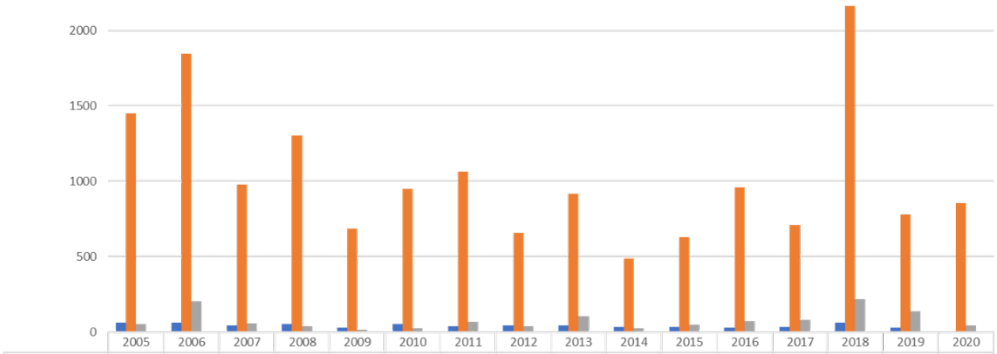
Abstract
The benefits and risks of raw foods merit consideration not only for food safety and public health. Our approach is consistent with OneHealth recommendations from FAO/OIE/WHO (https://www.cdc.gov/onehealth/basics/history/index.html) on replacing frameworks increasingly recognized as simplistic and inadequate with more holistic, integrated, and resilient frameworks useful for optimizing human, animal, and environmental health. Our work emphasizes analysis of recent human epidemiologic outbreak data on leafy greens and milk, as well as 21st century advances in research on microbiota of raw foods. Recent data document ineffective risk management for leafy greens (Figure 1) and failures of interventions to prevent campylo-bacteriosis in milks (1,647 illnesses associated with pasteurized and 1,288 illnesses associated with raw) prior to 2020. Future research initiatives are needed to optimize food safety and food security along dynamic and complex interactions for food chains, highlighting expansion of risk mitigation policies to more effectively and sustainably 'manage our microbes' in raw foods for health and wellness in complex local, regional, and global food markets.



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Outbreaks	62	64	45	53	30	54	41	45	44	36	34	32	33	61	30	7
Illnesses	1,450	1,848	979	1,302	684	949	1,064	657	917	486	628	961	709	2,165	781	854
Hospitalizations	55	204	57	40	18	27	68	40	106	25	51	73	82	219	139	46
Deaths	0	5	1	1	0	0	0	1	1	4	1	0	4	5	0	0

Figure 1. US CDC outbreak data for leafy greens (2005-2020)

Keywords
colonization resistance; predictive microbiology; risk analysis

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Biography
Margaret E. (Peg) Coleman (BS SUNY ESF/Syracuse University, MS degrees from both Utah State University and University of Georgia) is a medical microbiologist and sole proprietor of Coleman Scientific Consulting in Groton, NY USA (https://www.colemanscientific.org). Her career began with the US federal government (USDA), and Ms. Coleman has served as an invited expert for national and international organizations since the 1990s. She contributed to development of the Principles and Guidelines for Microbiological Risk Assessment (1999) with the Codex Alimentarius Commission, Committee on Food Hygiene. Her current interests include: benefit-risk analysis; quality analysis evaluation; and incorporating microbial ecology and microbiota data into risk analyses. She has been a member of the Society for Risk Analysis (SRA) and American Society for Microbiology since the mid-1990s and was acknowledged as an SRA Fellow in 2020 and was elected by her peers to serve as one of nine SRA Councilors last year.

D. Warner North (PhD, MS Stanford University; BS Yale University) is principal scientist of NorthWorks, a consulting firm located in San Francisco, California (www.northworks.net). Until 2009, he served as a consulting professor in the Department of Management Science and Engineering at Stanford University. Over the past fifty years Dr. North has carried out applications of decision analysis and risk analysis for electric utilities, the petroleum and chemical industries, and government agencies with responsibility for energy, health, and the environment. He has served on committees on the Science Advisory Board committees for the US Environmental Protection Agency since 1979, and he was recognized as a National Associate of the National Academies for co-authoring many reports dealing with environmental risk. Dr. North served as President of the Society for Risk Analysis (1991-92) and published extensively in diverse journals including Applied Microbiology, Risk Analysis, and Science.

Dietary Patterns and Associations with Metabolic Risk Factors for Non-Communicable Diseases

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Abstract

Background

Dietary risks are a major contributor to the increased burden of non-communicable diseases such as cardiovascular diseases, diabetes, and hypertension, especially in developing countries. However, evidence of the association between dietary patterns and health outcomes is scarce in sub–Saharan African countries like Ethiopia. This study aimed to identify principal dietary patterns and evaluate associations with metabolic risk factors such as hypertension, overweight/obesity, and abdominal obesity.

Methods

A community-based cross-sectional survey was conducted among adults in Bahir Dar, Northwest Ethiopia, from 10 May 2021 to 20 June 2021. Nutrition data were collected by using a standardized food frequency questionnaire. Anthropometric measures (weight, height, hip/waist circumference) and blood pressure were assessed using standardized measuring tools. Principal component analysis was conducted to derive dietary patterns, and one-way ANOVA and logistic regression were used to examine the association between dietary patterns and metabolic risk factors.

Results

This study identified two dietary patterns: 'westernized' dietary pattern, which is positively correlated with the consumption of meat, dairy, fast foods, alcohol, fish, and sweet/sugary foods, fruits, and vegetables; and 'traditional' dietary pattern, which is positively correlated with the intakes of cereals, legumes, roots/tubers, coffee, and oils. The young age of adults, being married, and middle income showed an association with the highest quartile of westernized patterns; and older age, being unmarried, and low-income with the highest quartile of traditional dietary patterns ($p<0.05$). The prevalence of metabolic risk factors like hypertension was significantly lower in adults with higher quartiles of the traditional dietary pattern (AOR= 0.34, 95% CI: 0.14, 0.82; $p=0.02$) and with higher quartiles of the westernized dietary pattern (AOR= 0.31, 95% CI: 0.14 to 0.72; $p<0.01$).

Conclusion

This study identified two types of dietary patterns, westernized and traditional, and revealed a significant association with metabolic risk factors like hypertension. Identifying the main dietary patterns in the population could be informative in considering local-based dietary recommendations and interventions to reduce metabolic risk factors.

Keyword

Dietary Patterns; Principal Component Analysis; Association; Hypertension; Bahir Dar; Ethiopia

Effects of Lotus Seed Resistant Starch and Branched Amino Acid on Dexamethasone-Induced Muscle Atrophy C2C12 *in vitro*

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Abstract
The muscle is not only an organ involved in motility but also an important organ for regulating blood glucose and insulin action. Also, branched amino acids(BCAAs) are well-known to improve muscle health by modulating muscle anabolic pathways. Recently, resistant starch has been actively reported the effects on muscle health as well as chronic diseases. We have reported the effects of lotus seed on anti-obesity and anti-diabetic properties in the previous study. However, there are no studies on lotus seed-resistant starch(LSRS) on the muscle health combination with BCAA. We prepared the lotus seed-resistant starch and found an adequate combination ratio of the LSRS with BCAAs. In this study, we aimed to confirm the effects of the combination treatment of LSRS with BCAAs on muscle atrophy-induced C2C12. Treatments were two different ratios of LSRS to BCAAs(leucine:isoleucine:valine=1:1:1) at 1:9(LB19) and 5:5(LB55) since best cell viability on dexamethasone-induced C2C12 was observed through preliminary experiment. From the findings of RT-PCR, the levels of Atrogin1 and MuRF1 mRNA expression involved in muscle atrophy were significantly decreased in the LB19 and LB55 compared to the PC(dexamethasone) ($p<0.05$), and IGF-1 mRNA expression increased compared to the PC ($p<0.05$). On the other hand, the expression of TNF-α, an inflammatory factor, was significantly decreased in the LB19 and LB55 compared to the PC. In particular, the LB55 significantly decreased MuRF1 and TNF-α and increased IGF-1 compared to the LB19. In conclusion, both the LB19 and LB55 groups alleviated muscle atrophy, and the LB55 group was particularly effective. However, further studies is needed on the mechanisms of how these treatment groups act on muscle atrophy.

Biography
Su Bin Hwang is on PhD program at Chung-Ang University, South Korea. She has published more than 5 papers in reputed journals.

Research Studies on Medicinal Plants for COVID-19 Treatment in 3 Southern Provinces (Savannakhet, Saravanh and Champasak Province)

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[1]Institute of Traditional Medicine, [2]Food and Drug Department, [3]Faculty of Pharmacy, University of Health Sciences, [4]Lao Tropical and Public Health Institute, [5]Provicial Health Department of Savannakhet Province, [6]Savannakhet Provincial Hospital, [7]Provicial Health Department of Saravane, [8] Saravane Provincial Hospital, [9]Provicial Health Department of Champasak, [10] Champasak Provincial Hospital

The Important Rational

COVID-19 is a lung viral infectious disease caused by a new variant of SARS-CoV-2, an epidemic occurred at the end of 2019 in Wuhan, China and hasspread in the world wide. Lao PDR has also had COVID-19 cases that were transmitted fromabroad and continued to outbreak in communities throughout the country. In Lao PDR at that time the number of infected people increased every day, till September 30, 2021 the cumulative cases were 14,816. This COVID-19 disease is a sudden respiratory disease; the number of variants are quickly spreading with easy contact. Currently there is no medicine that can be treated with certain results, most of the patients have no symptoms or only mild symptoms, anda few have severe and severe symptoms that can cause people to die. The Institute ofTraditional Medicine has conducted a study of documents, found evidence and conducted a study to verify the quality and safety of 3 types of medicinal plants: Lazabi, Phak Kaw Thongand Ka Sai Khao to be used in the treatment of COVID-19 infected people in 3 southern provinces of Lao PDR.

Objective

To study and verify the quality, safety and benefits of using 3 types of medicinal plants: Lazabi, Phak Kaw Thong and Ka Sai Khao in the prevention and treatment of people who have infected by COVID-19, aiming to be a scientific reference and promote the use of 3kinds of Lao traditional medicinal products in the prevention and treatment of COVID-19 in the Lao PDR.

Methodology

Review the regional and international literatures of the research on the quality and safety confirmation of 3 kinds of medicinal plants, develop into a formula, produce a medicine capsule and use it for infected COVID-19 patients in Savannakhet, Saravan and Champasak provinces. The four patient groups of 3 provinces will be selected by using Simplerandom and systematic methods. Three patient groups will take the 3 kinds of medicine capsules and 1 group take the empty capsules as control.

Research results

Through the review of literature and research, we can verify the quality andsafety of 3 kinds of medicinal plants. It was found that Lazabi has the main chemical as Andrographolide, which is beneficial to help in increasing the body's immunity, cure colds,

coughs, sore throats and tonsillitis, and is also used to treat dysentery and diarrhea; Ka Sai Khao contains the main important chemical as Panduratin A which help to maintain health, strengthen the body's immunity, male strength, cure colds, coughs, help fight viruses and bacteria; Phak Kaw Thong contains the main important chemicals as Quercetin, Hyperoside with the benefits of building the body's immunity, adjusting the balance of blood pressure, curing flu, fever, cough, anti-virus and bacteria. After using 3 kinds of capsules from May to atotal

of 383 cases of COVID-19 in 3 southern provinces, it was found that all patients' SpO2 could be maintained at a normal level throughout the 7-day treatment period (SpO2=95-100%),the symptoms of the infected patients had changed for the better or disappeared clearly on the5th or 7th day of each follow-up period, with a significant remedy in comparing to the symptoms such as fever, cough, fatigue, lack of appetite, headache, nose. , sneezing, nausea, diarrhea and others .on the day before the medicine that was given.

Summary
383 COVID-19 infected patients in the groups that used 3 herbal medicines, after using the medicine on time, the patient's status improved, had a fresh and strong mind, took meal with appetite and slept well; and no case got worse symptoms, which means that there was no lung infection case and death. According to the results of the study, it was found that these 3 kinds of medicinal plants are effective in alleviating the symptoms of COVID-19 infected patients with mild to moderate symptoms, in accordance with the research reports of countries in the region and internationally. It is possible to promote the use of traditional medicine produced from these 3 types of plants as common household medicine and as an alternative to use to build up the body's immunity and treat COVID-19 infected people with mild to moderate symptoms. In the future, it is necessary to continue scientific research, to findthe mechanism of the body's benefits of medicine against diseases and germs, side effects, etc., with an emphasis on guaranteeing the effectiveness and safety and benefits of the medicine, aswell as encouraging and promoting its general and widespread use.

Keywords
COVID-19; Andrographolide; Panduratin A; Quercetin; The Immune System of the Body

Soil-Activity of Sulfur-Bearing Silicate-Phosphate Glasses

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Abstract

Glass fertilizers, as an innovative media of soil fertilization, constitute a reservoir of bioavailable essential nutrients in the amounts adapted to the plants' demand. Their spatially cross-linked silicate-phosphate framework, in the voids of which useful elements exist, determines the durability of such materials in a humid soil environment. Due to this durability as well as the regulation of nutrients release to the soil environment by root exudates and processes occurring at the glass-soil solution interface, the adverse effects of overfertilization are prevented. To assess the application potential of such fertilizers, studies were conducted in which glasses from the SiO_2-P_2O_5-K_2O-MgO system enriched with sulfur - a macroelement present in modern soils in deficient amounts - were exposed not only to solutions that mimic root exudates (an '*in vitro*' experiment) but also to soil substrate (an '*in vivo*' experiment). The simulation of rhizosphere conditions in the '*in vitro*' experiment was carried out by subjecting the tested materials to a 2% citric acid solution, while the precise amounts of released nutrients were determined using the ICP-AES method. As a result of the '*in vivo*' experiment, in which the samples were exposed to soil substrates and conditions resembling the seasonal variability of domestic climate, soil-activity as well as glass-soil interaction mechanism of acquired materials were assessed (SEM/EDS investigation). The results of the present research may constitute an invaluable guidance for further development of glassy carriers of various micro- and macro-elements and for the production of such materials on an industrial scale. Research project was supported by program "Excellence initiative – research university" for the AGH University of Science and Technology and also was funded by the National Science Centre, Poland, project number 2018/31/D/ST8/03148.

Biography

Magdalena Szumera has completed her PhD from AGH UST Faculty of Materials Science and Ceramics. Currently, she holds the position of Associate Professor at her alma mater. So far, she has supervised five doctorates, over 25 master's theses and 35 engineering theses. She is a member of the Polish Ceramic Society, the Scientific Council of Chemical Engineering, and the Ceramic Sciences Committee of the Polish Academy of Sciences in Krakow. She is also an expert on the Polish Accreditation Committee and the National Agency for Academic Exchange NAWA. Furthermore, she has published more than 89 papers in reputed journals.

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