UNIVERSITY OF AGRICULTURAL SCIENCES AND VETERINARY MEDICINE CLUJ-NAPOCA

the 21st INTERNATIONAL CONFERENCE
LIFE SCIENCES FOR SUSTAINABLE DEVELOPMENT
15 th- 17 thSeptember 2022, Cluj-Napoca, Romania

BOOK OF ABSTRACTS

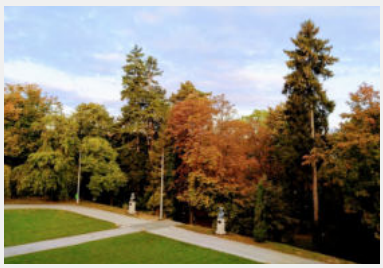
No 9/2022



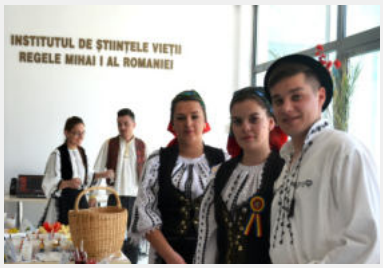








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IMPRESSUM

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WELCOME MESSAGE

We are pleased to welcome you to the 21st International Conference "Life Sciences for Sustainable Development", Romania to share our scientific performance and progress during this special scientific event.
The University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca, classified in the first category of "advanced research" universities of Romania, place also confirmed by the European University Association (EUA). The University becomes nowadays one of the most prestigious academic institutions from Romania.
The 21st International Conference "Life Sciences for Sustainable Development" is a dynamic forum of exchanges for scientific experiences, innovative ideas and concepts, future prospects in agriculture, plant and animal science, food science and technology, biotechnology, veterinary medicine, as well in other interdisciplinary and transdisciplinary areas.
The 21st International Conference "Life Sciences for Sustainable Development" includes invited conferences, presented by known international and national personalities, oral and poster presentations, where recent advanced scientific and technical results can be seen, especially now, in the context of the new European Research Program "Horizon 2020" and of the national Research – Technological Development and Innovation Program, related to Life Sciences.

The conference programme will consist of ten main sessions:

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

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

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

With best wishes,

Prof. Cornel CĂTOI, PhD
Rector

Prof. Dan C. VODNAR, PhD
Vice-rector for Research

ANNOTATION

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

CONFERENCE PROGRAMME

Thursday, 15th September 2022		
08:30 -12:30	**Registration of participants**	Aula Magna "Mihai Șerban", UASMV Cluj-Napoca
08:30 -13:30	**Poster Display** (*For more details, please see the program)*	
09:00-09:10	**Opening ceremony** Rector, Cornel CĂTOI Vice-Rector, Dan C. VODNAR	Aula Magna "Mihai Șerban", UASMV Cluj-Napoca
09:10-11:40	**Plenary Session** Chairpersons : Sanda ANDREI, Mirela CORDEA, Sonia SOCACI, Cristian COROIAN, Mignon SANDOR	Aula Magna "Mihai Șerban", UASMV Cluj-Napoca
09:10-09:40	***INFLUENCE OF AGRICULTURAL PRACTICES ON THE SOIL FAUNA AND FRUIT QUALITY OF ORGANIC ORCHARD IN PLOVDIV REGION (BULGARIA)***	***BILEVA TATYANA, Bulgaria***
09:40-10:10	***PARTICIPATORY PLANT BREEDING AS A STRATEGY TO A MORE DIVERSE, SUSTAINABLE AND RESILIENT AGRIFOOD SECTOR: EXAMPLES OF INITIATIVES AIMED AT ORGANIC FARMING***	***ADRIÁN RODRÍGUEZ-BURRUEZO Spain***
10:10-10:40	***NEW APPROACHES IN THE FIGHT AGAINST ANIMAL TUBERCULOSIS IN SPAIN: ARE SMALL RUMINANTS IMPORTANT FOR ITS CONTROL?***	***DAVID CANO-TERRIZA, Spain***
10:40-11:10	***MODERN STRATEGIES BOOSTING SUSTAINABILITY AND INNOVATION IN THE FOOD SYSTEM***	***PITIA PAOLA, Italy***
11:10-11:40	***MICROALGAE AS HUMAN FOOD AND ANIMAL FEED: CHALLENGES AND PERSPECTIVES***	***ELADL ELTANAHY, Egypt***
11:40 –12:00	***Break***	
12:00-13:30	**Doctor Honoris Causa Award Ceremony**	Aula Magna "Mihai Șerban", UASMV Cluj-Napoca
13:30 –14:30	***Lunch – Biodiversity Research Center***	
15:00-19:00	**Oral Sessions (sessions I-X)** - *For more details, please see the program*	
19:00-24:00	**Gala Dinner *(Restaurant DAVINCI)***	
Friday, 16th September 2022		
09:00-13:00	**Poster Presentation and Evaluation** **Oral Sessions (sessions I-X)** *For more details, please see the program*	
13:00-13:30	***Break***	
13:30 –13:40	**Closing ceremony and Best Poster Awards-**	Aula Magna "Mihai Șerban", UASMV Cluj-Napoca
13:40 –14:30	***Lunch – Biodiversity Research Center***	
Saturday, 17th September 2022		
08:00-20:00	**Post - symposium tour (optional)** **Route: Cluj-Napoca**-Sibiu-Astra-Apold-**Cluj-Napoca**	

LIST OF ABSTRACTS

ORAL PRESENTATIONS

SESSION 1: AGRICULTURE

THE INFLUENCE OF AGRICULTURAL PRACTICES ON THE SOIL FAUNA AND FRUIT QUALITY OF ORGANIC ORCHARD IN PLOVDIV REGION

Tatyana BILEVA[1*], Ekaterina VALCHEVA[1] and Nadezhda PETKOVA[2]

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Introduction: Apples constitute an important part of the human diet as they represent a major source of dietary antioxidants. The different apple orchard management affects soil dynamics and plant metabolism, resulting in differences in fruit quality. Organic farming is beneficial for conserving soil fauna and stimulating the decomposition lead to biological activity of the soil and respectively soil fertility.
Aims: The aim of the current study was to analyze the influence of organic agricultural management on soil microfauna and antioxidant potential in the apple fruits of Florina variety.
Materials and Methods: The study was realized on the organically managed orchard with Florina apples at the Agroecological Centre of Agricultural University of Plovdiv. Soil fauna was extracted via Tullgren funnels from each subplot - fallow, sward and buffer zone. Four groups of four trees were randomly chosen as the sample trees. The antioxidant potential was evaluated by four different assays. Statistical analysis was performed using Excel 2015 and Statistical Software Statistica 7.0.
Results: Comparing the frequency of species in the three subplots, it was found that only one of all identified 9 taxa was present in all of it - Collembola. The most numerous and with the highest frequency of meeting in fallow and sward are the representatives of Collembola, while in buffer zone dominated by representatives of Oribatidae. In general, the apples from the sward orchards demonstrated the highest antioxidant activity by three methods (DPPH, ABTS, and FRAP assays). The highest antioxidant potential was demostrated by ABST method (90 to 103 mM TE/g dw).
Conclusion: In agroecosystems, the soil biota activity is strongly influenced by farming practices. Ecological parameters were higher in sward orchard and buffer zone. Therefore, the organically grown apple Florina cultivar from the sward orchard demonstrated the highest antioxidant potential and presents a rich source of phenolic compounds.

Keywords: antioxidant activity, apple, microarthropods, organic farming.

References

1. Bouayed J., Hoffmann L. and Bohn T. (2011). Antioxidative mechanisms of whole-apple antioxidants employing different varieties from Luxembourg. J. Med. Food, 14, 1631.
2. Dobrevska G., Dallev M., Bileva T. and Valcheva Ek. (2020). Management Practices For Bioproduction of Apples in The Plovdiv Region. Agricultural Sciences Volume 12 Issue 27, 92-97. DOI**:** 10.22620/agrisci.2020.27.014.

Acknowledgements:This work was supported by the Bulgarian Ministry of Education and Science under the National Research Programme "Healthy Foods for a Strong Bio-Economy and Quality of Life" approved by DCM # 577 / 17.08.2018".

DIABROTICA IN ROMANIA - MONITORING AND POSSIBILITIES TO CONTROL THE PEST

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Introduction: In Romania, one of the most important agricultural crop that occupies significant areas is corn. It is considered that about a third of the potential harvest is destroyed by harmful organisms, so that plant protection, as an applied biological practice, contributes to the increase in the production of corn and improve of the quality of the harvest. For the corn culture, one of the most dangerous pests is the western corn rootworm - *Diabrotica virgifera virgifera* (Le Conte). This pest was reported for the first time in Romania in 1996, in Arad county, after which it was systematically expanded, starting from the west of the country to the center of the country, beeing reported now in almost all areas cultivated with corn, especially in monoculture.
Aims: To establish some important aspects about the pest related to the attack and damage, the factors that influence the reproduction of this pest, options to combat both larvae and adults, of *Diabrotica virgifera virgifera*.
Materials and Methods: Bibliographic study regarding the research carried out on this pest, monitoring the pest with the help of traps with synthetic sex pheromones, establishing the flight curves of the adults.
Results. In the monitoring and control of pests, the economic importance of each species and the level of losses that could be produced must be known; species harmful to agricultural crops should not be eliminated but should be kept at a low level. Pest control is imperative for plant culture, different methods of protecting plants (and including the stored harvest) against harmful organisms being a major component of all Good Agricultural Practice Guidelines.
Conclusion. Agricultural Plants Protection practices must be carried out according to the PED (economic damage threshold) in order to minimize the number of phytosanitary interventions and to favor the natural combat factors that regulate / limit the populations of the damage agents.

Keywords: corn, *Diabrotica virgifera virgifera*, monitoring, control

SENSOR BASED INTER-ROW MECHANICAL WEED CONTROL IN SUGAR BEET FROM TRANSYLVANIA

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Introduction : Integrated weed control management are very important practices that needs to be applied in sugar beet cultivation, and in programs of pesticide reducing and environment protection such as Green Deal or IWM strategies. Weeds left in sugar beet cause problems at harvesting and increase the weed populations in the future crops due to the mature weed seeds left in the soil. Weed control strategies are made strictly chemical with 4 to 6 times spraying herbicides mixes at several timings (10-14 days interval) in the early growth stage of sugar beet, first 60 days until crop covers the soil. Precision agriculture including camera recognizing cultivation row and hydraulic steering are used often because they have a low procent of damaging the crop and the higher speed you can work with the tillage.
Aims: Mechanical weed control decreases the weed density and improves soil texture, and can reduce the number of chemical treatments. The aim is to find out how many treatments in sugar beet can be took out from the chemical control scheme and how much we can improve the yield.
Material and methods : Examinating the combinations of the chemical weed control and a precision mechanical weed control in sugar beet. We measured in two different years 2021-2022, at Vintana farm from south Transylvania, the weed density and the yield of sugar beet roots in four different experimental plots such as : (A.) uncontrolled, (B.) only mechanical control of weeds ,(C.) only chemical control and (D.) mechanical and chemical control. The data analysis is collected for weed density from all the plots and with two passes involving mechanical control plots on the stage of BBCH 19 and BBCH 31, including the hoe sensored based, set up for sugar beet 45cm rows wide.
Results : From the experiment the highest yield of sugar beet roots was recorded at the plot with a combined chemical and mechanical control (D.), with an increase up to 20% yield from (C.) only chemical control treatment and a yield increase of more than 50% than the only mechanical control (B.).
Conclusions : Results show that is possible to reduce herbicides but not replace them entirely in sugar beet and you can achieve more yield including the integrated strategies of weed management. The number of chemical herbicides in sugar beet is getting smaller and are continuing banned, also the herbicide resistance of weeds is increasing, so the present study can contribute to the reduction of herbicides and a lower weed density.

Keywords: herbicide reduction; hoeing; integrated weed management; mechanical control; sugar beet.

THE SIX STEPS TO CREATING YOUR ANDROID SOIL PROTECTION MOBILE APPLICATION

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Introduction: The use of mobile devices and their applications in research, monitoring, and soil protection activities is gaining more and more ground lately.
Aims: In order to use devices for soil protection, we set out to bring to the fore, describe and analyze the six steps needed to develop dedicated mobile applications.
Materials and Methods: Our scientific approach is based on the framework methodology for developing applications for mobile devices, in close compliance with the methodology for the development of agropegological studies, first published in 1987, with subsequent amendments and completions.
Results: As a result, an information flow of no less than six steps was obtained, starting with the application menu configuration and environmental data acquisition methods and ending with saving, processing, transferring, and, where appropriate, deleting the unused or useless data.
Conclusion: Through the present research, we have demonstrated that there is a concrete, visible and palpable workflow in the development of mobile applications dedicated to the protection of soil resources; knowledge of this flow helps both in configuring, developing, testing, and validating applications in the field, as well as in raising awareness, prioritizing and assuming the needs of users (ecologists, pedologists, practitioners, teachers, and researchers, etc).

Keywords: Android OS, dedicated monitoring, mobile apps implementation, soil protection.

References:

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ARE GREEN MANURES BENEFICIAL FOR THE ARABLE SOIL MICROBIOTA? A SHORT REVIEW.

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Introduction: The use of green manure has become an increasingly common agricultural practice because of the benefits it can bring to the soil. Microbiological benefits are usually underestimated even if soil microbiota is considered a key factor in soil because of its involvement mineralization of organic matter and the availability of nutrients in the soil.
Aims: The aim of the present review was to look over the results of recent papers and to highlight the importance and evaluate the effects of different plant species used as green manures on soil microbiological parameters, with special reference to functional diversity, enzymatic activity, soil respiration and mineralization of soil organic matter
Materials and Methods: In order to achieve this goal, data from articles belong national and international databases were used. We focused on agricultural soil in order to deepen our understanding about changes of microbial community induced by the use of green manure practices. To achieve this goal, academic literature was analyzed using different academic database. A set of keywords were chosen and used as an algorithm to search for articles to be reviewed.
Results: The results obtained through these studies follow the way in which Green Manure can influence both soil quality and microbial activity in arable soils.
Conclusion: Following the research undertaken, it can be stated that the use of green manure is an important tool for evaluating the physiological profile of the microbial community and can present a current research topic aimed at clarifying how the functional diversity of the microbial community, the enzymatic activity, soil respiration, mineralization of organic matter may be affected by this agricultural practice.

Keywords: Green Manure, Soil, Microbial community, Decomposition

CURRENT METHODS FOR HIGHLIGHTING HEAVY METALS PRESENT IN FRUITS

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Introduction: Fruits are natural sources of vitamins, minerals, sugars, pectins, and essential or toxic metals in a wide range of concentrations. As a result of soil pollution, we are also concerned over the last decades about the knowledge of the mechanisms for transferring heavy metals from soil to fruit, as it is scientifically proven that they may cause different pathologies and adverse reactions [Jarup, 2003; Sathawara et al., 2004 as cited in Radwana et al., 2006; Stefanut et al., 2007; Shaheen et al., 2016].
Aims: The paper proposes a comparative analysis between two methods of working to highlight the heavy metals in fruit. Both methods are standardized. Fruit families from different continents were selected, but both with temperate climates. The analysis includes a number of heavy metals, potentially toxic to the human body (Pb, Cr, Ni, Cu, Zn, Fe) but has focused mainly on lead (Pb) and chromium (Cr).
Materials and Methods: As regards the research methodology, a comparison was made between the standardized working method in Romania and the one in South Africa, both with reference to international law. The interest samples are fruits from *fam. Rosaceae,* - gen. *Malus* and *Pyrus*- and fruits from *fam. Musaceae* -gen. *Musa*. The fruit varieties analyzed were different. The experimental framework also provided for the highlighting of heavy metals in fruit and the recommended daily intake in each country.
Results: Comparative research shows that,

- In Romania, the EU Member State, for the pollutant Pb, the highlighted contents of the genus *Malus* have values in the range of 0.8 mg/kg^{-1} to <1 mg/kg^{-1}; the current legislation and Codex Alimentarium provide for 0.1 mg/kg^{-1} and the recommended daily intake is 0.0035 mg/kg^{-1}.
- In South Africa, the exposed contents range from 1.52 to 3.17 mg/kg^{-1} for the pollutant Pb; the current legislation, i.e. the Codex Alimentarium provides 0.3 mg/kg^{-1} and the recommended daily intake is 0.25 mg/kg^{-1}.

Conclusion: There are a variety of research methods to highlight the presence of heavy metals in fruit. However, we consider that standardized methods are the most appropriate to be considered for comparative reports, synthesis studies or interdisciplinary research.

There is less research into the transfer factors of heavy metals from high soils and long polluted fruit. It is therefore an open front for detailed research, with highly accurate equipment and interest factors.

Keywords: heavy metals, contamination, transfer factor soil-fruits

EMERGY EVALUATION USING SCALEM® SOFTWARE IN ORGANIC FOOD SYSTEMS

Adrian GLIGA[1*], Mignon SANDOR[1], Mugurel JITEA[2], Dumitrița DASCĂLU[1], Iulia DAN[2]

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Introduction Emergy evaluation (EME), unlike most of the other environmental assessment tools, adopts a nature-centered viewpoint, focusing on the resources used up by a human system (an activity, a territory) and considering it as embedded within its natural environment (Odum, 1996). In contrast, other approaches such as Life Cycle Assessment (LCA) (European Commission, 2010) have a user-oriented or utilitarian perspective and evaluate the environmental consequences of materials and energy flows taken from and emitted to the natural environment by human activities.
Aims: This project aims to analyse different forms of organic and sustainable food systems (FS) in different geographical and institutional contexts to understand how different layers of efficiency can contribute to improved natural and human resource use efficiency.
Materials and Methods: The software SCALEM® has been developed to compute emergy flows by using life cycle inventory (LCI) models, which are a collection of thousands of interconnected unit processes containing average technology data.
Results: Increasing knowledge of sustainable food systems and supply chain: the project will increase knowledge of sustainable and organic farming systems, including agroforestry systems and the related food supply chains.
Conclusion: Developing a more comprehensive and complete environmental accounting framework of anthropic systems requires the combination of complementary methods and tools.
LCA is a mature and recognized method for evaluating environmental impacts on different areas of protection, including resource depletion whilst EME introduces the donor-side perspective for evaluating the total contribution of the geobiosphere processes on resource formation and on the anthropogenic systems functioning.

Keywords: FOODLEVERS, Scalem[@], Emergy, organic, sustainable, food system

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MONITORING OF DIURNAL PASTURE LEPIDOPTERANS LOCATED IN BILBOR COMMUNE, HARGHITA COUNTY

Ilie Daniel HÂNGAN[1], Ionuţ Bogdan HULUJAN[1], Teodora FLORIAN[1*], Ion OLTEAN[1*]

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Introduction: Lepidoptera and Hymenoptera are the most important groups of pollinators in nature. In the meadows of mountainous and sub-mountainous areas, due to the anthropogenic factor and climate change, there is a degradation of biodiversity, affecting the trophic base for some insect species, especially of the order Lepidoptera (Lanta et al., 2009).
Aims: In the period 2019-2020 we proceeded to collect the species of lepidoptera from the meadows of Bilbor commune with the help of the entomological net. Based on this information, we proceeded to establish a conservation plan for these species.
Materials and Methods: Every year we proceeded to collect butterflies from meadows and hayfields between May and August. The collected material was spread on a polystyrene support in order to preserve the wings. The identification of the species was performed in the laboratory, under a binocular magnifying glass, comparing the elements of external morphology with the information in the determinants and the images on the specialized sites. For each species we looked for information on the trophic base, the biological cycle and its protection status.
Results: During the monitoring period of the lepidopteran entomofauna we collected 28 species, which systematically belong to the following families: 7 from the Lycaenidae family, 17 from the Nymphalidae family and 5 from the Pieridae family. The species with the highest abundance are: *Maniola jurtina* L., *Boloria selene* Denis & Schiffermüller, *Argynnis paphia* L., *Pieris mannii* Mayer, *Pseudophilotes schiffermuelleri* Hemming and *Coenonympha pamphilus* L. The relatively good state of biodiversity conservation in the area is confirmed by the fact that in *Pseudophilotes schiffermuelleri* Hemming, *Argynnis paphia* L. and *Coenonympha pamphilus* L. which are potentially threatened taxa in Romania, in this area the population is well represented. From the Nymphalidae family, *Boloria selene* Denis & Schiffermüller is one of the most vulnerable taxa in the country, in the Bilbor area it is a well-represented species. *Colias myrmidone* Esper, which is in decline in Europe and is on the verge of extinction, still has a very small population only in the Bilbor and Gheorgheni area at an altitude of about 1000 m. *Lycaena dispar rutile* Werneburg, *Lycaena thersamon* Esper and *Colias australis* Verity considered considered vulnerable taxa in the country, in the Bilbor area still have a very small population.
Conclusion: The main objective of the management of the natural meadows in the investigated area is to maintain the favorable conservation status for the existing species, through a management of their habitats that takes into account their ecological requirements.

Keywords: Lycaenidae, Nymphalidae, Pieridae, monitoring.

References:

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RESEARCH OF THE INFLUENCE OF THE AGROPHYTOTEHNICAL WORKS ON RAPESEED PRODUCTION PARAMETERS AND IMPACT OF THE NUMERICAL DENSITY OF PEST COMPLEX

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Introduction: Rapeseed is an annual plant from the Cruciferae family, cultivated throughout continental Europe, on the North American continent as well as in Asia, due to its oil-rich seeds. As an oleaginous plant, rape is currently in fourth place on the world map, after soy, sunflower and palm (GOURRION and colab., 2020). In the production of vegetable oils, rape has a particularly important contribution worldwide, the seeds containing about 42-48% oil in the varieties, and in the newly created hybrids it can reach over 50% (METSPALU and colab., 2015).
Aims: Development of an advanced technology for rapeseed culture.
Materials and Methods: For pest monitoring we used the methods approved in entomological research (colored panels, pheromonal and semiochemical traps, direct observations in the culture). The collected species were identified in the laboratory with a binocular magnifying glass.
Results: The populations of *Meligethes spp*. have been reduced by placing rapeseed crops in correlation with the spontaneous vegetation in the area (meadows, pastures, forest curtains, etc.), knowing that these areas maintain a high biological reserve and which migrate into the rapeseed crop. Also, we studied the most efficient agro-phytotechnical works and their impact on reducing the dynamics of the numerical density of some pests, especially cruciferous fleas.
Conclusion: In the present research work, we demonstrated the suitability of differentiated agrotechnics for the cultivar used in cultivation and the impact of soil works of reducing the population of Melighetes and cruciferous fleas.

Keywords: agrotehnics, control, cultivar, pests

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MONITORING OF *OXYTHYREA FUNESTA* PODA AND *TROPINOTA HIRTA* PODA SPECIES IN FRUIT SHRUBS CROPS IN CLUJ COUNTY

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Introduction: Two species of the family Cetoniidae are commonly found in agricultural ecosystems: *Oxythyrea funesta* Poda and *Tropinota* (*Epicometis*) *hirta* Poda (Bîrzanu and Mitrea, 2021). Adults emerge in spring and feed on flower pollen and then consume the internal organs of the flowers, sometimes also the sepals. They are polyphagous, attacking annual plants, fruit trees and shrubs, but also plants of spontaneous flora.
Aims: In the period 2020-2022, we monitored the presence of these two pests in blackberry and blackcurrant plantations, in order to establish the bioecology and frequency of the attack.
Materials and Methods: The studies were carried out in the blackberry collection from USAMV Cluj-Napoca and in the ecological black blueberry plantation from Recea Cristur, Cluj county. Every year in the period April-July the two species were monitored. The collection of adults was done with Barber traps and blue-coloured containers. Species identification was done by morphological characters.
Results: The presence of the two species in fruit bush crops was revealed by aspects of the life cycle and correlated with flowering phenotype. Because the flight of adults begins earlier than the flowering of blackberries and blackcurrants, they are initially signaled mainly on spontaneous plants, then migrating to fruit shrubs. The adult flight of *Tropinota hirta* has been reported since the last decade of April in blackcurrant and has progressed until the end of the second decade of May. The adult flight of *Oxythyrea funesta* in blackberry culture was from the second decade of May to the second decade of July. As confusion is often made between the two species, key aspects of morphology were used to facilitate identification. *Tropinota hirta* Poda has no white dots on the pronotum and *Oxythyrea funesta* Poda has 6 white dots. On the elytra of *Oxythyrea funesta* the white spots are much more numerous and the pubescence is lower compared to *Tropinota hirta*. The tibia of the forelegs of *Tropinota hirta* has three teeth while *Oxythyrea funesta* has only two.
Conclusion: *Oxythyrea funesta* Poda and *Tropinota hirta* Poda are potential pests in fruit shrubs crops. Their monitoring is required to determine population density and the damage assessment.

Keywords: *Oxythyrea funesta* Poda, *Tropinota* (*Epicometis*) *hirta* Poda, monitoring, fruit shrubs.

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EFFECTS OF ORGANIC VERSUS CONVENTIONAL CROP PROTECTION ON DISEASES AND YIELDS ON BARLEY GENOTYPES

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Introduction: Organic agriculture has expanded worldwide, even in Romania it has grown in the last few years from 245 (k) ha in 2015 to 469 (k) ha in 2020 (statistics.fibl.org). Under the conditions in Transylvania, foliar diseases in the spring barley crop include a permanent risk factor for the stability of crops (Nagy et al. 2010). Net blotch is one of the most important diseases of barley, causing significant economic damage (Clare et al. 2020).
Aims: This field experiment attends to compare the effects of organic versus conventional crop protection practices and their influence on barley yield on the 8 spring barley cultivars in conditions at ARDS Turda.
Materials and Methods: There were organized polifactorial trials after block split type with 8 cultivars and 3 treatment variants: (T0) untreated, (T1) applied organic fungicides, and (T2) applied conventional fungicides. The experiment was carried out during one growing season (2021) under natural inoculum pressure. In the field, the attack degree for main diseases was determined at BBCH 55-57 for 20 plants/plot. The fungicides used contain: prothioconazole 53 g/l + spiroxamine 224 g/l + tebuconazole 148 g/l at a dose of 0.6 l/ha (chemical) and Zn, Mg, Cu, and plant extract at dose 1 l/ha (organic).
Results: In the experimental year the main diseases detected in the barley crop were net blotch and loose smut. Following the evaluation of the attack of *Pyrenophora teres* were observed the lowest AD (%) values in the culture system where ecological products with fungicidal and fortifying effects were applied increased the self-defense capacity of the plant. The highest values of F (%), I (%), and AD (%) were recorded in the untreated culture system in all 8 varieties.
The most sensitive varieties to the attack are the Daciana and Tatum genotypes, and the most tolerant are the Su Lilly and Sunshine genotypes.
Conclusion: In the present research work, we demonstrated that these tested organic fungicides presented a good efficacy in controlling spring barley foliar diseases.

Keywords: spring barley, diseases, organic fungicide

TRIAL PROTOCOL FOR EVALUATING PLATFORMS FOR GROWING MICROGREENS IN HYDROPONIC CONDITIONS

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Introduction: Microgreens are young plants that are consumed at the seedling stage, which have a short production cycle (about 14 days) and require little space for growth. Microgreens are emerging functional foods of the 21st century gaining interest for their sustained nutraceutical properties and are an optimistic prospect for expanding especially for the consumption of the population in large urban areas and in terms of food security. The hydroponic production of microgreens has potential to develop, both at an industrial, and family level, due to the improved production platforms.
Aims: The paper aims to develop, based on the review of the literature, a set of procedures and parameters, included in a test protocol, for hydroponically cultivated microgreens in order to optimize the cultivation process and allow the harvest of the best possible products in any hydroponic installation.
Materials and Methods: This review was conducted as part of the GoHydro project (https://gohydro.org). The literature review, carried out by us, with a focus on literature from the last 10 years, was conducted between November 2021 and April 2022, using the databases: Web of Sciences, Scopus, Science Direct, and Google Scholar. The established procedures and parameters are analyzed with the goal to highlight, within the tested platforms, in what way, different environment and nutritional factors (used as a keywords in the review pro-cess) can influence the development of microgreens and can improve its production and quality.
Results: Procedures and parameters proposed to be monıtored ın order to ımprove the performance of mıcrogreen productıon ın hydroponıc platforms are: (1) different determinations: in controlled settings (setting the optimal ranges) and in operational environments settings (weather conditions in the area/ testing period); (2) procedures and parameters related to microgreen growth (obtaining the microgreens seedling, determining microgreen germination, measurements on the morphology of plants, microgreens harvesting); (3) microgreens production and quality (fresh biomass yield, dry matter content, water use efficiency, bioactive compound analysis, statistical analysis).
Conclusion: Procedures and parameters monitored will provide us with the evaluation information of the hydroponic platforms to ensure a positive influence on the quality of microgreens with higher concentrations of active substances and nutrients valuable for human health.

Keywords: microgreens; hydroponic; production and quality paremeters

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MONITORING INSECT POPULATIONS USING THE MEKO SUCTION TRAP

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Introduction: The number of insect populations is declining due to intensive agriculture and increasingly frequent climate change (Seiboldet et al., 2019; Hallmann et al., 2020). In order to be able to apply the best phytosanitary protection methods against pests without causing major damage to the existing biodiversity, it is first necessary to identify the insect populations in the respective area.
Aims: In 2020-2021, the MEKO Insect Suction Trap was used to identify the diversity of the existing insect entomofauna near the experimental fields of plant protection in the area of Cologne.
Materials and Methods: The monitoring of insects was carried out in the months of April-July. The MEKO Suction Trap device has a suction power of approximately 32m3 /min at a height of between 1.65 and 2m. The insects attracted were collected in a collection solution in 500ml plastic containers. The operating time of the device was between 9 am and 7 pm. After collection, the samples were transferred to the laboratory and the insects were identified. The value of the ecological indices was calculated for each of the species collected.
Results: In 2020, 55,709 specimens were collected, which systematically belong to 25 families from 10 orders. From the total catches, the Diptera species represented 53.73%; the order Thysanoptera 14.32%; Coleoptera 10.92%; Hemiptera 9.5%; Hymenoptera 9.4%; Araneae 0.8%; Phthiraptera 0.6%; Lepidoptera 0.57%; Acari 0.16% and the order Neuroptera 0.009%. In 2021, 50,887 specimens were captured. The contribution of the orders in the structure of the entomofauna was as follows: the order Diptera 47.88%; Thysanoptera 32.53%; Hymenoptera 8.64%; Coleoptera 5.03%; Hemiptera 4.54%; Acari 0.81%; the orders Araneae, Lepidoptera, Phthiraptera and Neuroptera were also included with values of between 0.3% and 0.002% of the total catches.
Conclusion: Following this monitoring, it was found that 6,568 individuals were captured from the useful entomofauna in 2020 (representing 11.78% of the total catches), and in 2021 5,533 individuals were captured (representing 10.87% of the total catches).

Keywords: Suction Trap, dynamic of insects, monitoring.

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STUDY ON THE ADAPTABILITY OF SOME SORGHUM HYBRIDS IN THE PEDOCLIMATIC CONDITIONS OF JUCU, CLUJ COUNTY

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Introduction: In the current context of global warming, the sustainable development of agriculture can be achieved by expanding the areas cultivated with drought-tolerant plants with high production potential. Sorghum caryopsis, in order to be intended for human consumption and animal feed, must first of all be free of phytopathogenic agents and meet a series of essential quality conditions. Unfortunately, in unfavourable storage conditions (too high temperature and humidity), caryopsis is attacked by a wide spectrum of pathogens (*Fusarium, Alternaria*).
Aims: In this context, the aim of our study is to evaluate the adaptability and productive potential of six sorghum hybrids, identification of pathogens presents on sorghum caryopsis, their quality indices, as well as mycotoxin content.
Materials and Methods: The research was conducted in the experimental field of the Faculty of Agriculture in Jucu, Cluj County a single-factor experiment. The hybrids were Alize, Armorik, Mousson, Foehn, Arabesk and Shamal. No treatments were done, only mechanical hoeing.
Results: In the pedoclimatic conditions of Jucu, Cluj County, all the sorghum hybrids taken in the study obtained productions of over 5 t/ha. The average production of the hybrids was 5578.98 kg/ha. The most productive sorghum hybrid was Shamal with significantly positive differences compared to the control. From the data obtained from the notes, observations and analyzes carried out, we can conclude that the percentage of sick caryopses was high in all the hybrids analysed, the microorganisms identified on the caryopses belonged to the genus *Fusarium* and *Alternaria* and the mycotoxin content was very low in all the hybrids analysed.
Conclusion: This research highlighted the importance of Sorghum which becomes an alternative because it needs only half of the rainfall required by corn (it succeeds even when there is less than 350 mm annual rainfall), being able to replace the corn crop when there are conditions for a poor corn crop.

Keywords: sorghum, production, feed, phytopathogens, mycotoxins

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THE EFFECTS OF HEAVY METALS ON SOIL

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Introduction: The fact that some soils and irrigation water are contaminated with heavy metals represents more than a problem, is a threat to the environment, food safety, and human and animal health (Gonzales and Ghneim-Herrera, 2021). Maintaining the activity and diversity of soil microbial biomass (SMB) and microflora is fundamental to sustainable soil management (Allison et al., 2008). Soil contamination with heavy metals represents their excessive accumulation as a result of human activities. Heavy metals that contaminate soils are mercury (Hg), cadmium (Cd), lead (Pb), chromium (Cr), and zinc (Zn), these toxic substances are retained by the soil and act as a filter for their properties.
Aims: The aim of this paper was to investigate the impact of heavy metals on soil, also the methods to combat their toxicity on agricultural soils.
Materials and Methods: In order to achieve this goal, data from articles belong national and international databases were used (Science Direct, NCBI).
Results: The results obtained through these studies aim to develop possible strategic plans to reduce the degree of pollution and investigate the impact of these heavy metals on the soil. A promising strategy to reduce the concentrations of heavy metals is bioremediation. This method is based on the capacity of microorganisms and bacteria for compound sequestration and transformation. The use of mechanisms and the applicability of remedial strategies based on plants and microorganisms is the most effective way to treat contaminated agricultural soils.
Conclusion: Due to the fact that heavy metals are highly studied, the importance of knowing the negative impact they have on different types of soil, especially agricultural soil is essential. At the same time, the ways to combat them, are based on the ability of microorganisms and bacteria to sequester and transform the compounds.

Keywords: heavy metals, soil, contamination

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PHENOTYPIC RESPONSE OF SPRING WHEAT GENOTYPES TO DIFFERENT ENVIRONMENTAL CONDITIONS

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Introduction: Wheat (*Triticum aestivum* L.) is one of the world staple foods that is often exposed to different biotic and abiotic stress factors which cause a high yield reduction. Spring wheat represent a real and viable alternative to meet food needs.
Aims: a group of 30 spring wheat genotypes was tested under different environment condition for its grain yield capacity and grain quality for the identification of the specific spring wheat ideotype to Transylvanian Plain conditions.
Materials and Methods: 30 spring wheat genotypes created at Agricultural reseach and Development Station from Turda were sown in five different environment conditions to establish their productive potential. The biologic material was teste in field condition at Agricultural Research and Development Station from Turda, Agricultural Research and Development Station from Lovrin – in the West of Romania, Agricultural Research and Development Station from Secuieni, Agricultural Research and Development Station from Livada- in North-West Romania conditions respectively at National Institute of Research and Development for Potato and Beet Sugar Braşov.
Results: the adaptability capacity of spring wheat is much more limited than winter wheat, but in optimal conditions their yield potential can exceed 5 t/ha.
Conclusion: five spring wheat genotype was identified as high productive cultivars with a good adaptability to different environment conditions. The quality indices for spring wheat genotype

Keywords: adaptability, grain yield, quality**,** spring wheat.

SUSTAINABILITY IN SMALL SCALE FARMS – NEW APROACHES FOR ASSESSMENT

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Introduction: Demand for animal products is predicted to double over the next decades while intensification of production affects natural resources like land or water and lead to higher GHG emissions and other environmental impacts. In this context, holistic sustainability assessment of agricultural systems should became a major objective for scientists, policy makers and farmers.
Aims: PATHWAYS is a European research project which bring together multiple actors to develop a common method for the evaluation of livestock food system sustainability and resilience against current policy objectives. A reflective learning approach through stakeholder involvement at multiple levels, ensuring actors within livestock value chains to be part of the project activities will be developed.
Materials and Methods: We will apply an innovative, participatory food system assessment and redesign process through a strong multi-actor approach via a multi-actor platform, national practice hubs and a community of practice, to identify and evaluate contrasting holistic scenarios for the sustainable development of the livestock sector in Europe. We will use the project outcomes to identify development pathways that meet multifaceted societal demands, both currently and in the future
Results: The overall interaction between the above elements will focus on a "back-casting" for the identification and evaluation of transition scenarios and barriers and levers for change. Rich qualitative data will also be collected from the practice hubs to generate "practice visions" for sustainable livestock farming futures in a range of regional contexts. Separate "policy visions" will be identified by the European multi-actor platform. Outcomes will in-turn be fed back to practitioners in each practice hub for comment and discussion.
Conclusion: PATHWAYS results will be translated into policy, research and business level recommendations via innovative communication tools while the consumers will be informed about healthy food consumption and sustainable livestock sectors.

Keywords: sustainability, small farms, practice hub, live lab

THE DENSITY INFLUENCE ON SOWING ON PRODUCTION FOR THE MAIZE HYBRID PR0217

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Introduction: Of the total area cultivated with cereals worldwide, maize occupies 27.3% and of the total area cultivated with cereals in the European Union, maize occupies 17.7%.The optimum density of plants for maximum maize production per unit area differs from one maize hybrid to another due to interactions between the hybrid and different densities (Luca & Tabără, 2011)
Sowing density is influenced by the cultivated hybrid, soil moisture and fertility. The reaction of hybrids to the increase in density is differentiated depending on the habit of the plant, the position of the leaves. The high density in conditions of insufficient water and fertilizers determines the premature drying of the basal leaves and leads to the reduction of the number of grains/ plant.(Roman &Tabara, 2011)
Aims: The present paper has analyzed how sowing density influences the size of productivity elements and production of maize hybrid PR0217, a hybrid of FAO 420 group, recommended for arid and semi-arid areas in the plain area. During the research, a comparison was made between the sowing scheme in equidistant rows at a distance of 70 cm with a density of 7 germinable seed/m² and the sowing scheme in equidistant rows at a distance of 35 cm between rows with a density of 14 germinable seed/m².
Materials and Methods: During the vegetation period, the succession of the growth and development phenophases of the plants was followed, biometric measurements were performed and the elements of productivity were determined. The dates on which the observations and determinations were made were: May 14, June 10, July 1 and August 28, 2021.
Results: As a result, the reduction of the nutrition surface from 0.15 m (in the version sown at 70 cm) to 0.076 m (in the version sown at 35 cm) had the consequence of reducing the vegetative growth with implications on the size of the surface.
Assimilation at the level of each plant, but with an increase of the values of the leaf surface index as a result of the density of the sea that covers much better the surface of the soil.
Conclusion: As a result, the increase in plant density does not have the consequence of increasing production, because there is a limit density
above which production does not increase, on the contrary it begins to decrease, due to the fact that light becomes a limiting factor of plants per hectare that corresponds to the optimal density of the maize crop.

Keywords: maize, phenophase, production, productivity elements.

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THE IMPACT OF CLIMATIC REGIME ON WINTER WHEAT YIELD IN CONSTANTA AREA

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Introduction: Wheat is recognized as a plant that is cultivated all over the world, due to its genetic diversity and great ecological plasticity. Thus, wheat crops can be found from the equator to parallels of 66 degrees north latitude and respectively 45 degrees south latitude (Povară, 2000). From a climatic point of view, the main limiting factors for wheat yield are: temperatures, precipitation and light. For example, according to Bunting et al. (1982), wheat cultivation is generally prevented if average annual precipitation is greater than 1000 mm.
Aims: The main objective of this study was to evaluate the influence of climatic regime on winter wheat yield and to see the role of organo-mineral fertilizers under this type of climatic conditions.
Materials and Methods: This paper is based on interpretation of climatic and yield data from 1961 to 2018 and on investigation carried during 2017-2018 on experimental plots located in Năvodari, Constanta County. The experimental plot is part of pedoclimatic micro-zone I1O-CZ (K) – Micro zone of limestone chernozem, with costal climate, in region with corrugated landscape. For a climatic point of view, it belongs to I1 zone-dry, drought, seaside climate, characterized by average annual temperature 10.5°C-11.5°C, solar radiation 132-136 kcal/cm^2, average annual precipitation 350-400 mm, average monthly precipitation IV-V: 200 mm, deficit IV-X: 442-465 mm. The climatic data used in this paper were taken from the National Meteorological Agency and from the Dobrogea Regional Center.
Results: We obtained different results depending on climatic regime and the organo-mineral fertilization.
Conclusion: The data analysis showed that the yield is largely dependent on the climate, being negatively affected by the increase in climate variability.

Keywords: climatic regime, organo-mineral fertilizers, yield, winter wheat.

EFFECT OF SOWING DATE ON SOYBEAN GRAIN YIELD AND SEED QUALITY

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Introduction: Soybean is the most important non-cereal grown around the world being the 4th crop regarding the cultivation area (Serafin-Andrzejewska et al., 2021). Bastidas et al (2008) revealed that delaying planting after 1 May led to significant linear soybean seed yield declines. There is still little knowledge about the influence of sowing dates on soybean grain yield and quality grown in Romania and also on the suitability of available genotypes on different crop technology. For a better understanding of the variation of sowing date impact on soybean productivity more reports are needed.
Aims: In order to evaluate the influence of sowing date on soybean grain yield and seed quality, a field experiment was conducted at Agricultural Research and Development Station in Turda (ARDS Turda), in 2021.
Materials and Methods: The experiment was based on a randomised block design with three replications, using plots of 12 m^2. Ten very early, early and semi-early soybean genotypes were experimented. The seven soybean varieties and three perspective lines were mechanized sown, at two different sowing dates (12 of April and 5 of May) practicing 50 cm distance between the rows.
Results: Even if, regardless of the analysed maturity group, higher values for: number of pods/plant, number of grain/plant, grain weight/plant and thousand kernel weight were obtained at the second sowing date, the maximum yield was achieved when soybean genotypes were sown in April. In this study, in the earlier sowing date higher values for protein content were obtained. Opposite trend was revealed for oil content.
Conclusion: The results obtained revealed that yield, yield elements and seed quality were high or very high influenced by the genotype and also by sowing date.

Keywords: soybean, sowing date, yield, quality.

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THE NEED TO RESTORE POST-INDUSTRIAL ECOSYSTEMS: IMPORTANCE AND FUNCTIONS OF RIPARIAN BROWNFIELDS

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Introduction: Healthy riparian areas are of unique importance for delivering a wide range of ecological services so indispensable to the well-being of humans and to the overall ecological diversity (MEA, 2005). Unfortunately, large areas of the Earth's urban riparian zones have been impacted by anthropic activities such as mining and industry. Therefore, restoration of ecosystems on post-industrial sites represents an important part of contemporary restoration ecology.
Aims: In this context, the aim of our study is to evaluate to which extend the restoration of urban riparian brownfields could increase the amount of ecosystem services provided by this type of habitat.
Materials and Methods: The research was conducted on a post-industrial site located in Baia Mare city, Romania, historically polluted with heavy metals. The ecosystem services provided by this disturbed ecosystem were assessed according to the list of ecosystem services proposed by CICES (Haines-Young and Potschin, 2018), and considering the local plant species diversity.
Results: Our results showed a limited number of ecosystem services delivered by the disturbed ecosystem analysed and a low plant species diversity. While many groups of plant species identified are native for the riparian habitat, a high percent from species compositions is occupied by the invasive alien species *Reynoutria japonica* Houtt., impacting the importance and functions of this site. Based on these findings we proposed a list of plant species which could be used in the restoration of this post-industrial ecosystem.
Conclusion: This research highlighted the importance of restoration actions on the range of ecosystem services delivered by riparian post-industrial sites.

Keywords: ecosystem services, disturbed ecosystem, riparian brownfield, heavy-metal pollution

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SESSION 2: ENVIRONMENTAL PROTECTION

NATURAL RADIOACTIVITY AND ITS IMPACT ON THE ENVIRONMENT: RESEARCH TECHNOLOGICAL ASPECTS

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Introduction: People are exposed to both natural and fabricated types of radiation, in addition to the radiation exposure from the surrounding environment throughout lifetime. The predominant part of the natural radiation in the environment is caused by cosmic radiation and telluric radiation. In addition, human activities involving the radiation use and radioactive materials cause radiation exposure. Radioactivity is known as the process by which certain naturally occurring or artificial nuclides undergo spontaneous decay releasing new energy.
Aims: To define Technologically Enhanced Naturally Occurring Radioactive Material (TENORM), which is naturally occurring radioactive materials that have been concentrated or exposed to the accessible environment due to human activities (e.g. mining or water processing).
Materials and Methods: TENORM such as radium ^{226}Ra, thorium ^{232}Th, potassium ^{40}K and radon ^{222}Rn, shall be considered in the technical measurements.
Results: Specifically, radon is considered as the main source of natural radiation to which the building occupants are exposed, the difference between radon exhalation and emanation should be distinguished. In addition, the role of radon diffusion length influencing the radon flux from the surface of building products and air exchange rate in living spaces is important to be emphasized. These radionuclides cause two types of radiation and radiation exposure: external and internal. The external radiation is caused by the gamma-emitting radionuclides, which in the uranium series mainly belong to the decay chain segment starting with radium ^{226}Ra. The internal radiation in the human body is caused by natural radionuclides in food, water, and air. The internal radiation exposure (inhalation) is due to radon ^{222}Rn (from ^{238}U decay chain), and marginally to its isotope thoron ^{220}Rn (from ^{235}U chain), and their short-lived decay products.
Conclusions: On the research level, the radiation levels might be studies theoretically (modeling) and practically by employing different analytical radiation techniques on the environmental samples. Consequently, the environmental radiation effect on the human and the surrounding environment is mandatory to be measured and compared to the standard IAEA permissible dose levels.

Keywords: radioactivity, environment, techniques

METHODOLOGIES OF ESTIMATION OF THE IMPACT OF CLIMATE CHANGES ON NUTRITIONAL STATUS OF PLANTS. A REVIEW

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Introduction: Climate change, the periodic change in the Earth's climate determined as a result of changes in the atmosphere, as well as the interactions between the atmosphere and various other geological, chemical, biological and geographic factors in the Earth system.
Aims: The aim of this study is to emphasize the results of a theoretical study concerning methodologies of estimation of the impact of climate changes on nutritional status of plant.
Materials and Methods: The methodology of the study consist in consulting databases on internet and speciality books from different sources, including e-books.
Results: A series of methodologies were analysed, and according to this approach, the following methods resulted as suitable: the Delphi technique which is a tool for using the points of view of a group of experts on the predictions of potential damage caused by climate change and the Monte Carlo method which is used to describe the approximation of solutions to the quantitative problems of climate change expressed by indicators, with the help of statistical sampling.
Conclusion: Considering the results of our study, one may conclude that Delphi technique is most suitable for the foreseeing a potential damage caused by climate change on agro-ecosystems at the national and EU level, while Monte Carlo method may be used as a method to translate the uncertainties related to the input data of the models, built on uncertainties related to the expected results.

Keywords: Delphi technique, Monte Carlo method, simulation.

ADVANTAGES AND LIMITATIONS OF SATELLITE IMAGERY IN PLANT INVASION MONITORING: A REVIEW

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Introduction: Species invasion control is one of the major conservation target today (Pyšek and Richardson, 2010). The traditional method for plant species mapping rely on field identification of plants in given transects but this method implies intensive labour, associated high costs, and incomplete coverage of the landscape.
Aims: In this context, the aim of our study is to discuss the suitability of satellite imagery (SI) technique in plant invasion monitoring in terms of advantages and disadvantages compared to the traditional methods.
Materials and Methods: The study is based on a detailed literature review of peer-reviewed journal articles and conference papers addressing the topic followed by our research.
Results: Our study highlights that an increasing number of researches conducted so far indicate that SI are a key tool for the identification and effective management of invasive alien species. The major advantages listed so far comprise: low-cost and accurate technique for early detection of species invasiveness, repeatable measurements and consistent monitoring records. Despite of these important recognitions, the use of SI is often limited by a number of factors. One of the most decisive criteria for a proper and correct evaluation relies on the requirement that the population or stands of invasive species must be visible from the air, which means that the research field used for collecting field measurements should include a high level of invasion (polygons with a species cover higher than 50%). Secondly the application of this method relies on a proper identification of the most important characteristics regarding species phenology such that we can further discriminate the targeted invasive plant species from other neighbouring species.
Conclusion: SI constitute a promising method for plant invasion monitoring, being a cost- and time-efficient technique which applied properly could deliver accurate and repeatable measurements for early detection of plant species invasiveness.

Keywords: invasive alien species, plant invasion monitoring, satellite imagery

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TESTING THE ABSORPTION POTENTIAL OF MICRO AND MACROELEMENTS FROM THE SOIL ON THE FLAX CROP

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Introduction: Recent compartmental changes in the consumption of today's human society have led to unwanted effects both of the environment and food resources. Mineral substances, are important for the entire life cycle of plants and human alimentation.
Aims: The main purpose of the research is to determine the absorption capacity of the flax plant of macro and microelements from the soil to provides a complete picture of the plants nutritional status depending on the climatic environment in which the flax crop is present.
Materials and Methods: The samples taken into account for the analysis consisted of: soil samples from 5 representative points at depths between 0-10 cm and 10-20 cm; flax (*Linum usitatissimum* L.) straw and seeds from seven varieties. Determinations of mineral elements in soil, plants and seeds probes were performed using an ElvaX Mobile - a portable Energy Dispersive - X-Ray Fluorescence (ED-XRF) analyser.
Results: Potassium was the most abundant macroelement on all samples followed by Ca. Among the microelements, Fe tended to be most abundant on soil probes and Ti on flax straw and seeds.
Conclusion: The results of the study revealed that *Linum usitatissimum* L. like all other plants, obtain the mineral substances from the environment, which is why there is an interdependence between the chemical composition of the soil and the plant. Flax is a good source of both macro- and microelements in a balanced human diet and the consumption of linen seeds could be a health-promoting strategy to meet the requirement of element dietary reference intakes.

Keywords: microelements, macroelements, *Linum usitatissimum* L, ED-XRF, human diet

PHYTOSANITARY RISK ANALYSIS IN CONTROL OF *CERCOSPORA BETICOLA* Sacc. (1876) IN SUGAR BEET IN CONTEXT OF CLIMATE CHANGES

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Introduction: According to the European and Mediterranean Plant Protection Organization (EPPO, 2002), phytosanitary risk analysis (PSA) is the process of evaluating biological or other scientific and economic evidence to determine whether a pest should be regulated and the severity of possible phytosanitary measures that should be taken against it. to.
Aims: The aim of this study is to emphasize the results of a study concerning the phytosanitary solutions for the control of the main diseases in sugar beet in context of climate changes.
Materials and Methods: Risk analysis for the target pathogen for sugar beet, namely *Cercospora beticola* Sacc. (1876), which produces cercosporiosis of beet, was conducted in an experimental location, on three plots, respectively Viișoara commune, Cluj County, in 2021.
Results: The means of the degree of attack of *Cercospora beticola* Sacc. (1876) results from the monitoring carried out between April and September (optimal time interval for the appearance and manifestation of sugar beet diseases) in the experimental year 2021, highlighted small variations, with values around 24%. The highest average value of the degree of attack is 24.91%, and the maximum 24.08%. The differences between the degree of attack by the pathogen of beet root rot Cercospora beticola Sacc. (1876) recorded in the two experimental years were statistically insignificant ($p > 0.05$), for the period analyzed each year, respectively the months of April - September.
Conclusion: A multiple correlation coefficient equal to 0.892 (R2 = 79.60%) was obtained, the analysis of the regression line, $Y = 7.228 + 0.298X1 + 0.972X2$, demonstrates a greater influence of the rainfall regime on the degree of attack and a much greater influence lower thermal regime, similar to the situation recorded in the experimental year 2020. The highest degree of attack of *Cercospora beticola* Sacc. (1876) was located at the peak of its manifestation around the value of 42%, under the conditions of a pluviometric regime starting from 170 mm and thermal from 20 0C.

Keywords: crop, fungi, pathogen, prevention measures.

RAPHANUS SATIVUS PLANTS: A MODEL FOR STUDYING PLANT EFFECTS GROWTH AT ELEVATED CARBON DIOXIDE AND OZONE STRESS

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Introduction: In the last years, the global concentration of carbon dioxide has risen more than ever, from 385 ppm in 2010 to 416 ppm in December 2022. The high concentration of CO_2 is beneficial for the plants due to the rise in the rate of photosynthetic carbon fixation. Still, the high carbon dioxide concentration comes with increasing global temperature by more than 0.5 degrees.
Aims: We studied the influence of elevated carbon dioxide (800 and 1200 ppm) on plants from the Brassicaceae family (*Raphanus sativus* var. Johanna*, Raphanus sativus* var. Helga*, Raphanus sativus* var. Rozaria) fumigated with ozone in order to study the impact of both stressors on the photosynthetic parameters, terpene emission, and biochemical characteristics.
Materials and Methods: The plants were grown at different concentrations of carbon dioxide (400 ppm, 800 ppm, 1200 ppm) and subsequently fumigated with ozone at 100 ppm for 1 minute. The photosynthetic parameters (net assimilation rate, stomatal conductance to water vapor) have been determined using a gas-exchange system for both control and treated plants. Volatile organic compounds (monoterpenes) have been monitored using gas chromatography-mass spectrometry techniques. At the same time, we determined the total phenolic compounds, the total concentration of flavonoids, and the amount of chlorophyll present in the plants.
Results: We have shown the photosynthetic parameters as assimilation rates and stomatal conductance to water vapor increase for plants grown at elevated CO_2. At the same time, the concentrations of the primary and secondary metabolites decrease, and the VOCs emission decrease for plants after the fumigation with ozone. Regarding the total phenols, the total concentration of flavonoids and the amount of chlorophyll present in the plants decrease drastically after the short period of ozone stress.
Conclusion: In the present research work, we demonstrated that elevated carbon dioxide could negatively impact the plants, making them less tolerant to ozone stress.

Keywords: elevated carbon dioxide, photosynthesis, secondary metabolites, ozone stress.

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CIRCULAR ECONOMY AND FOOD SURPLUS

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Introduction The surplus food occurs when the supply, availability and nutritional properties of food exceed market demand and this phenomenon can occur at every stage of the supply chain. Surplus food can lead either to new edible food formulas or to other products that represent accumulations of food left unmarketed in restaurants or supermarkets.
Aims: The aim of this study was to highlight the possibilities of interrelating the food industry with charities in order to capitalize on food surplus, by addressing issues specific to the topic, namely: causes of food surplus, food waste and their recovery, and by presenting a case study.
Materials and Methods: Methodology involved in the present study concerns the literature review and critical interpretation of data.
Results: Various ways to reduce food surplus are currently known, from the use of this surplus for various purposes, to sophisticated technological processes throughout industrial manufacturing processes. All concerns in the field, however, have a common goal, namely to ensure the sustainable distribution of food and global food security, which involves the judicious distribution of food resources to be allocated exactly where it is needed.
Conclusion: Worldwide, many organizations are known to deal with both the distribution and redistribution of surplus food from one source, either restaurants or grocery stores, to those in need. The impact on the environment of waste that is in a position to undergo biodegradation processes is a problem that the EU is making efforts to solve.

Keywords: food bank, sustainability, redistribution, resource.

TOTAL POLYPHENOLS ESTIMATION FROM BERRIES

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Introduction: The improved procedures and methodology for obtaining berry matrices represent an issue that is part of the existing national and international concerns of enriching the range of nutraceutical products with a high content of antioxidants, in this case resveratrol, through scale production wide range of alternatives designed to both help allopathic medication and prevent the occurrence of diseases.
Aims: Our study aims to test different solutions for extraction of polyphenols from studied berries from the Cluj County in order to emphasize the best extraction solvent/solvents.
Materials and Methods: The samples of berries used in the study consist of the species: *Rubus idaeus* L., *Ribes nigrum* L., *Vaccinium vitis-idaea* L., *Vaccinium myrtillus* L. and *Rubus fruticosus* L. These were harvested from various regions belonging to the mountainous area of Cluj County. The plant material was dehydrated and stored properly in vials the the crude chemical analysis was performed.
Results: The highest values of total polyphenols were obtained with the binary ethanol/water (80:20, v/v) extraction system. Thus, the analysis of the extracts from the berry matrices made with the binary system ethanol/water (80:20, v/v) led to the following values of the polyphenolic content: 0.92 mg GAE/g for raspberry; 1.55 mg GAE/g for currants; 2.17 mg GAE/g for cranberries; 3.78 mg GAE/g for blueberries and 2.24 mg GAE/g for blackberries.
Conclusion: Due to the fact that the highest values of total polyphenols were obtained with the ethanol/water binary extraction system (80:20, v/v), in order to quantify the resveratrol content, the extractions were performed with this system. The quantification of resveratrol in the berry samples taken in the study led to the following results: 0.49 μg/g for raspberry; 2.63 μg/g for currants; 6.01 μg/g for cranberries; 3.45 μg/g for blueberries and 2.52 μg/g for blackberries.

Keywords: solvent, binary system, ethanol.

TESTING THE ANTI-BACTERIAL EFFECT OF AQUEOUS EXTRACT OF *Allium cepa* L. IN POTATO

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Introduction: According to FAO-STAT data (http://faostat3.fao.org) updated until 2020, worldwide, Europe ranks first in terms of the proportion of potato production at global level (41.90%), followed by by Asia (39.60%), America (12.70%), Africa (5.30%) and Oceania, which only has a contribution of 0.50% in the world potato production.
Aims: The present study aims to emphasize the effect of aqueous extract of *Allium cepa* L. in fight against *Erwinia carotovora* pv. *atroseptica* (Smith 1896) Yabuuchi et al. 1996 in potato.
Materials and Methods: The experiment carried out in 2021 has an organization according to a two-factor scheme, with three repetitions, according to an experimental scheme implemented according to the randomized block method. The placement of the plots is done differently for the three repetitions, for Redsec potato variety, depending on the control and the experimental variants corresponding to the treatments experienced.
Results: For the Redsec potato variety, the calculation of the basic statistical parameters and the cluster analysis highlights over the entire experimental period, the treatment with 3.3% Allium cepa L. aqueous solutions is highlighted, which leads to the lowest degree of average attack of the bacteria (GA5 = 1.20%) and the treatment with Alcupral 50 PU with the lowest performances, leading to the recording of an average degree of attack (GA4 = 2.91%) close in value to the untreated control (GA4 = 3.36%).
Conclusion: Over the entire experimental period, the best results were obtained with the non-conventional treatment performed with an aqueous solution of 3.3% Allium cepa L. (GA6 = 9.13%) and 4% Allium cepa L. (GA2 = 9.16%), and the weakest (even weaker than in the case of the untreated control) under the conditions of treatment with Alcupral 50 PU (GA4 = 17.08%).

Keywords: attack degree, phytosanitary treatment, best results.

THE INFLUENCE OF ELEVATED CARBON DIOXIDE ON *BRASSICACEAE* DROUGHT TOLERANCE

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Introduction: Carbon dioxide is the main greenhouse gas from human activities. In the United States, in 2020, about 79% of all greenhouse gas emissions caused by people came from CO_2. Carbon dioxide is already in the air because it is part of the carbon cycle on Earth. In 2019, people put more than 43.1 billion tons of CO_2 into the atmosphere. Because of this, the amount of carbon dioxide in the atmosphere was 418 ppm in July 2022. Temperature increases, and lengthy episodes of drought create plant stress.
Aims: We studied the influence of elevated carbon dioxide (800 and 1200 ppm) on plants from the *Brassicaceae* family (*Brassica oleracea*, variety *capitate*, *Brassica oleracea*, variety *botrytis*, *Raphanus sativus*) in order to determine those plant's drought tolerance.
Materials and Methods: The control plants have been grown at an actual CO_2 concentration – 400 ppm, while the priming plants have been raised at elevated carbon dioxide (800 and 1200 ppm). After that, a short period of drought was applied, followed by a recovery time. The foliage photosynthetic characteristics (net assimilation rate, stomatal conductance to water vapor) using gas-exchange techniques have been determined for both control and treated plants. Volatile organic compounds (oxygenated pathway products by the action of lipoxygenase – LOX and monoterpenes) have been monitored using gas chromatography.
Results: We have been shown that photosynthesis parameters, volatile organic compound emissions, chlorophyll content, and total polyphenols concentrations are changing for plants grown at elevated carbon dioxide. Those parameters have been more affected by drought for plants grown at 800 and 1200 ppm carbon dioxide.
Conclusion: We were able to show, through the study that we have conducted here, that increased levels of carbon dioxide can have a detrimental effect on plants, making them less resistant to drought conditions.

Keywords: elevated carbon dioxide, photosynthesis, secondary metabolites, drought stress.

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TESTING TRACEABILITY OF WATER NITRITES AND NITRATES USING SOIL STUDIES

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Introduction: Agricultural nutrients are particularly important as a contributor to coastal and estuarine algal blooms. Increased nutrient input can stimulate excess algal growth, leading to low dissolved oxygen levels, potential for harmful algal toxins, blocking sunlight needed by aquatic organisms and plants, and degraded habitat conditions for benthic macroinvertebrates and other aquatic life. Sources of excess nutrients to rivers and streams, lakes, and coastal waters include fertilizers, wastewater, animal waste, and atmospheric deposition. In adequate amounts, the nutrients support the growth of algae and aquatic plants.
Aims: The aim of this study is to emphasize the results of a study concerning site specific soil nitrates and nitrites contents quality by quantifying in proximity of groundwater.
Materials and Methods: The study was developed according to specific methodologies. Soil samples were collected and analysed from the point of view of nitrates and nitrites contents using spectrometric methodology. The samples were collected from 8 different points an an area located in the Cluj County
Results: The results of the study emphasizes values an average by all 8 points content of 3.79 mg/L for nitrates, and 0.077 mg/L for nitrites. This study has importance because all soils, whether polluted or unpolluted, contain a variety of compounds (contaminants) that are naturally present. Such contaminants include metals, inorganic ions and salts and these compounds are mainly formed by soil microbial activity and decaying organisms.
Conclusion: The increased input of nutrients to a body of water can stimulate excessive growth of algae and aquatic plants, thereby creating eutrophic conditions that interfere with recreation and the health and diversity of vegetation, insects, fish, and other aquatic organisms.

Keywords: groundwater, indicators, nutrients, spectrometry.

CONIFEROUS BARK, NEEDLES AND CONES AS BIOINDICATORS OF AIR POLLUTION IN URBAN AREAS WITH INTENSE ROAD TRAFFIC

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Introduction: Despite the progress made in the last decades to improve air quality, anthropogenic organic and inorganic pollutants still represent a considerable threat to human health, especially in urban areas with intense car traffic and developed industry. Monitoring of these contaminants in the atmosphere by the direct methods or through is of particular importance at the international level to support environmental legislation in order to improve air quality, in both, urban and rural areas.
Aims: This study aims to use the coniferous bark and needles as bioindicators of air pollution with polycyclic aromatic hydrocarbons (PAHs) and trace elements emitted from road traffic in cities located in seventeen counties in Romania.
Materials and Methods: Pine, fir and spruce barks, needles and cones were sampled from trees located in the vicinity of intersections with intense traffic from important Romanian cities. Concentrations of 15 US EPA PAHs and trace elements (Pb, Cd, Ni and As) were determined by HPLC-FLD and respectively GF-AAS, after the microwave extraction and digestion procedures. Some diagnostic ratios of PAHs and PCA were used to trace de source of pollution.
Results: The PAHs were detected in tree needles, bark and cones samples, with values of ∑15PAHs ranged from 50-2525 ng/g, 119-1513 ng/g and 105-859 ng/g, respectively. The proportions of 2-3- and 4- ring PAHs were higher than 5- and 6- ring PAHs in needle, bark and cone samples. PAHs diagnostic ratios and PCA analysis, indicate that combustion of petroleum, coal and biomass were the major sources of PAHs in the passive samples from the studied areas. Trace elements were identified in all passive samplers, with values ranged from <0.04-1.23 ng/g for As, <0.02-0.50 ng/g for Cd, 0.26-20.99 ng/g Pb, 0.07-13.389 ng/g for Ni. Pb was identified in higher amounts in needles and barks, while Ni in cones.
Conclusion: In this study, we successfully demonstrated the suitability of coniferous passive samplers (bark, needles and cones) for monitoring the atmospheric pollution with PAHs and trace elements resulted from auto traffic. The most polluted cities were Drobeta Turnu Severin, Bistrita Nasaud and Miercurea Ciuc in term of both, PAHs and trace elements, Prahova for PAHs and Vrancea, Sebes, Fagaras and Vaslui for trace elements, where the traffic volume and building density from the sampling locations favours the retention of contaminants on the passive samplers.
Keywords: air pollution, bio-indicators, passive samplers, PAHs, trace elements

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MONITORING OF EPIGEAN BEETLES FROM THE GRASSLAND LOCATED IN BILBOR COMMUNE, HARGHITA COUNTY

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Introduction: A significant contribution on the population dynamics of harmful species is made by zoophagous insect species. The ecological importance of predatory species, especially from the families Carabidae, Coccinelidae and Staphylinidae, derives from the regulatory role of biocenoses (Rischen et al., 2021).
Aims: Monitoring epigean beetles in the investigated area; Analysis of the entomofauna structure of beetles; Calculation of ecological indicators for the collected species.
Materials and Methods: Barber traps were used to monitor beetle fauna. A number of 5 traps were placed annually. The traps were checked during the end of May and until the end of August, performing 6 checks so that we had 30 samples for the statistical interpretation of the results. All samples collected were sorted and determined in the laboratory to species level.
Results: In 2017, 268 specimens were collected at the 6 beetle monitoring deadlines using Barber traps. They belong to 55 species, systematically classified in 13 families. Of the total catches, 58.2% are represented by phytophagous beetles (represented by 27 species), and 41.8% of them are predatory beetles (represented by 28 species). Most catches belong to the Carabidae family, with 75 specimens represented by 14 species, which means about 30% of the total catches. Most of the specimens caught belong to the species *Carabus ulrichii* Germar. In 2018, 305 copies were collected. They belong to 56 species, systematically classified in 13 families. Of the total catches, 58.4% are represented by phytophagous beetles (represented by 28 species, 178 specimens), and 41.6% of them are predatory beetles (represented by 28 species, with 127 specimens). This year too, most catches belong to the Carabidae family, with 79 specimens represented by 13 species, which means 25.9% of the total catches. Most of the captured specimens belong to the species *Harpalus tardus* Panz. In the two years, 573 beetles, belonging to 65 species, were captured. Of the species reported, 31 are harmful species and 34 are zoophagous. Of the total number of catches, 334 specimens are harmful (58.3% of the total) and 239 are useful (41.7% of the total).
Conclusion: According to the Ecological Significance Index (W) 26 species are accidental with the value of this index below 0.1%; 34 species are accessories with the value of the index between 0.1-1.0%; 5 species are accessory with the value of the index between 1.1-5.0% (*Carabus ulrichii* Germar, *Harpalus distinguendus* Duft., *Ips amitinus* Eichh., *Ips typographus* L. and *Olibrus affinis* Sturm.).

Keywords: Barber traps, Carabidae, zoophagous species, monitoring.

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REMANUFACTURATION – A POSSIBLE SOLUTION FOR ECONOMY

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Introduction Remanufacturing technology is an effective way to reduce waste and reduce the degree of environmental pollution. This theme is a new field of research in development and an advanced technology for production growth and development, providing an extension of the entire life cycle of many manufacturing processes.
Aims: In the present study, we set out to present, in addition to the general considerations regarding the "zero waste" principle, three case studies illustrating the principles underlying remanufacturing, namely the remanufacturing of IT products, electronic products and, respectively, remanufacturing technology with laser.
Materials and Methods: The study is based on theoretical research and consists in on line scientific libraries consulting and the specific literature from the library of the University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca.
Results: The remanufacturing of IT products in the case of the US tends to focus on production for the domestic market. The small share of production that is exported tends to be directed to neighboring countries. The ability of manufacturers to export is also limited by regulations. It is estimated that 18% of remanufacturers of IT products consider environmental regulations to be an extremely important factor affecting their ability to compete in global markets. The constantly accelerated pace of technology makes product sectors obsolete almost as soon as they are purchased. This is especially true for electronic and electrical equipment, which contributes to increasing the amount of waste that is currently experiencing the fastest growth. Consolidation of machine surfaces by laser transformation are performed to increase erosion and erosion resistance. The results show that laser remanufacturing technology can be applied to successfully extend the life of the materials subjected to this operation.
Conclusion: The "zero waste" target is an approach to the whole economic system, which seeks to "dispose" rather than "manage" waste. The zero-emission process is a shift from traditional industrial practices in that waste from one system acts as input material for another system. This process supports an industrial transformation that can minimize the impact of production on natural resources.

Keywords: IT, laser, the "zero waste" principle, electronic products.

SALICACEAE PLANTS RESPONSES TO CLIMATE CHANGE AND RISING CARBON LEVELS

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Introduction: In the atmosphere, carbon dioxide is a natural gas and a part of the carbon cycle on Earth. The primary greenhouse gas that comes from human activity is carbon dioxide. High CO_2 levels are advantageous for plants because they promote photosynthetic carbon fixation and increase biomass production. However, in nature, the rise in carbon dioxide concentration is accompanied by increasing temperatures and prolonged periods of severe drought, which influence plant stress.
Aims: This study aims to determine the photosynthetic parameters, pigments, and secondary metabolites of 8 different *Salicaceae* species in order to show the differences induced by elevated carbon dioxide.
Materials and Methods: Different concentrations of carbon dioxide (400, 800, and 1200 ppm) were used to cultivate *S. purpurea*, *S. daphnoides*, *S. alba*, *S. fragilis*, *S. viminalis*, *S. alba* x *fragillis, S. triandra*, and *S. caprea*. Plants grown at various CO_2 concentrations were used to determine the photosynthetic parameters, volatile organic compound emission, chlorophyll, polyphenol, and flavonoid concentrations.
Results: For plants grown at elevated carbon dioxide levels, the photosynthetic parameters, and volatile organic compound emission rise while polyphenol and chlorophyll concentrations decrease.
Conclusion: Because the cycle of secondary metabolites is disrupted, plants grown with high carbon dioxide concentration are more susceptible to the effects of abiotic stresses.

Keywords: abiotic stress, increased carbon dioxide, *Salicaceae* family, secondary metabolites.

Acknowledgment: This work was supported by a grant from the Romanian National Authority for Scientific Research, CNCS – UEFISCDI, project number PN-III-P4-ID-PCE-2020-0410.

DESIGNING AN EFFICIENT PHOTOVOLTAIC SYSTEM SUITABLE FOR HOTELS

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Introduction: The hotel sector is a big consumer of energy. Using cleaner and cheaper energy sources like the implementation of a photovoltaic system could contribute to the reduction of operating costs, increase competitiveness and sustainability.
Aims: In this context, the aim of our study is to develop a software solution that can assist hotel ownerships (regardless of the level of knowledge they have in the field of photovoltaic systems) to successfully design a photovoltaic system at their own guest house.
Materials and Methods: The design of the software solution was made based on the data collected from a study site, namely Kalu Guesthouse, located in Constanta city, Romania. The first part of the research consisted in a full inventory of all electricity consumers found in this establishment, followed by the design of the software solutions using the multiple functions offered by Microsoft excel.
Results: The photovoltaic system developed in this study has an easy-to-use interface which requires the introduction of some general data regarding the electricity consumers and the specific energy consumption. Based on these parameters, the following calculations are automatically generated: Total average consumption/year (kW), Total average consumption/month (kW) and Total consumption average/day (kW). These calculations allow the user to select the type of photovoltaic system suitable for their own guesthouse from the predefined list, and following the selection, the program displays a list containing all the components necessary to create such an off-grid and/or on grid photovoltaic system and the costs associated with the implementation of the project.
Conclusion: The software solution developed in this study has a general use such that could assist with success any owner of hotel who would like to evaluate the suitability and costs associated with photovoltaic system implementation.

Keywords: renewable energy, guesthouse, photovoltaic system, design, software solutions for photovoltaic

THE INFLUENCE OF ELEVATED CARBON DIOXIDE AND OZONE STRESS ON RED CABBAGE PLANTS

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Introduction: Tropospheric ozone, also known as ground-level ozone, is created by chemical processes involving nitrogen oxide (NOx) and volatile organic molecules (VOC). This happens when pollutants from autos, power plants, industrial boilers, refineries, chemical plants, and other sources chemically react in sunlight. Elevated ozone levels can harm delicate flora and ecosystems, including forests, parks, wildlife refuges, and wilderness areas. Ozone, in particular, can damage plants throughout the growing season. On hot days, the ozone concentration might reach 100 ppb. Furthermore, atmospheric carbon dioxide concentrations have risen dramatically in recent years, reaching 420 ppmv in June 2022.
Aims: We investigated the Red cabbage plant (*Brassica oleracea* var. *capitata* f. *rubra*) from the *Brassicaceae* family grown at elevated carbon dioxide (800 and 1200 ppm) in order to examine the effects of both stressors on photosynthetic parameters, terpene emission, and biochemical traits.
Materials and Methods: The plants were cultivated in various carbon dioxide environments (400, 800, and 1200 ppm) before being fumigated for one minute with ozone at 100 ppm. Using a gas-exchange system, the photosynthetic parameters (net assimilation rate, stomatal conductance to water vapor) for control and treated plants have been identified. Monoterpenes, volatile organic compounds, have been tracked using gas chromatography-mass spectrometry methods. We also calculated the plants' total phenolic content, total flavonoid concentration, and chlorophyll content simultaneously.
Results: We have demonstrated the photosynthetic parameters for plants grown at elevated CO2 levels as assimilation rates and stomatal conductance to water vapor increase. After being fumigated with ozone, plants emit fewer VOCs and have lower amounts of their main and secondary metabolites. After a brief time of ozone stress, the quantity of chlorophyll in the plants and the overall concentration of flavonoids and phenols substantially drop.
Conclusion: The current study showed that increased carbon dioxide might harm plants and reduce their ability to withstand ozone stress.

Keywords: elevated carbon dioxide, photosynthesis, secondary metabolites, ozone stress.

Acknowledgment: This work was supported by a grant from the Romanian National Authority for Scientific Research, CNCS – UEFISCDI, project number PN-III-P4-ID-PCE-2020-0410.

STUDY UPON THE EFFICACY OF USING PRECISON AGRICULTURE FOR ENHANCING YIELD AND PRODUCTION IN BARLEY

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Introduction: Currently, a wide variety of mechatronic systems are implemented in precision agriculture. Mechatronic systems are also often used to monitor the sub-processes involved in a complex agricultural system, while each sub-process corresponds to a subsystem. The subsystems involved are often interconnected via IoT (Internet of Things).
Aims: The aim of this study to emphasize the drone efficiency for estimation of the necessities of nitrogen fertilization of barley using NDVI ”drone technology” in order to obtain best production and yield.
Materials and Methods: Our research was developed in 2020, on the Western Plain, Benecu de Jos, Timiș County. An experimental plot of land, measuring 5.40 ha, was organized. In order to obtain detailed recommendations on nitrogen fertilization, the plot was divided into five subplots.
Results: For barley production, the lowest average, equal to 6.90 kg, is reported for the unfertilized and untreated control variant, in the Pionier variety. The highest average, equal to 10.00 kg, is reported for the experimental variant II, fertilized with the Kangoo variety; the unfertilized and untreated control variant with the variety Planet – 100 sem/m2 and the experimental variant I, fertilized with the variety Focus sc101 – 12e. For productivity, the lowest average, equal to 4.63 kg, is reported for the unfertilized and untreated control variant, in the Pionier variety. The highest average, equal to 6.66 kg, is reported for the experimental variant III, fertilized with the Sunshine variety.
Conclusion: The results of our study show the effectiveness of drones in assessing the fertilization needs of a barley crop for obtaining best production and yield, using NDVI "drone technology".

Keywords: drone technology, input, IoT, variety.

SESSION 3: FOOD SCIENCE AND TECHNOLOGY

MODERN STRATEGIES BOOSTING SUSTAINABILITY AND INNOVATION IN THE FOOD SYSTEM

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The agri-food system is economically invaluable and critical to future European growth and competitiveness, despite its high diversity and fragmentation (> 99% are micro- and SMEs). In recent times, this manufacturing sector has progressively increased its complexity due to the growing interplay with food-related sectors (e.g. primary sector, distribution and logistics, nutrition) and the need both to decrease its environmental impact by reducing energy and water consumption and to minimize food waste and losses. Moreover, transversal challenges of different nature are threatening the economic and manufacturing progress by highlighting weaknesses and a limited resilience of the food value chains. Globalization, urbanization trends, climate change, changing in consumer demands and third-country competition, and more recently, Covid-19 pandemic and the conflict in Ukraine, are pressurizing the agri-food system at multiple levels and in multiple dimensions.
In this framework research is boosting disruptive scientific and technological advancements in food processing and modern approaches towards the use of the natural food resources and recovery of food wastes to obtain high quality and healthy products thereby innovation and sustainability could be promoted. However, to achieve these targets high qualified, skilled professionals and technologies are needed and academia has to modernise educational paths to match the current challenges and scenarios of the complex agri-food system
In this speech different technological strategies in food processing and formulations will be presented and discussed considering the current scenarios and challenges of the agri-food system in a forward-looking perspective.

THE ROLE OF GASTRONOMY AND CULINARY EDUCATION TO SUSTAINABILITY

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Malthus' theory states that the human population increases exponentially whereas food production increases arithmetically. In other words, while food production growth goes as 1-2-3-4-5 and so on, population growth goes as 1-2- 4- 8 -16 and so on. So at some point the population will exceed the total amount of food production and people will start starving. In the past, we have overcome this with the green revolution, chemical fertilizers and mechanization in agriculture. Now, the question is whether we will be able to overcome this in the future. So, gastronomy deals with the nutrition of the population and the prevention of hunger, as well as the sustainability of food and product diversity.

The UN describes “sustainable gastronomy” as “to promote natural and cultural diversity throughout the world through the use of a gastronomic model that encourages and supports the consumption of food products in an environmentally responsible manner”. Sustainable gastronomy focuses on not wasting any natural resources during the preparation of the food and continuing the production in the future in a way that will not be harmful to the environment or health.

For sustainability to have a chance, transformative changes especially in the culinary education should take place. Not only using local ingredients to reduce the carbon print but the cooking equipment, cooking techniques, new recipes, using and changing waste products and ingredients into usable new products should be taught in the courses. Moreover, new agricultural techniques, producing natural fertilizers should be demonstrated in practice. Reducing greenhouse gas emissions in the food supply chain is also a key measure for achieving sustainability targets so related courses must be added to the curriculum.

Attaining a healthy and sustainable food system is an urgent issue that depends on the joint efforts of governments, private and public sectors as well as individuals, and therefore it is very important to provide this awareness to future chefs through gastronomy and culinary education.

NOVEL BIOPACKAGING APPLICATIONS AS SOLUTIONS FOR SUSTAINABILITY

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Numerous alternatives of polymer based packaging materials are essential aspects of modern life. They are also inevitable for the agro-food industry to sustain the food preservation and shelf life, as food packaging solutions. However, use of plastics is one of the main causes for solid waste. As the world population is foreseen to reach around 10 billion by 2050, an approximate amount of 50% increase in need for the food sources and waste production is also predicted. Food sources also contribute to the total solid waste with their by-products, biomass from their waste and unused commodities because of certain quality defects. Therefore, attempts have significantly concentrated on to decrease the use of plastics, the amount of solid waste and environmental damage caused by pollution. Use of different constituents from agri-food industries is a promising solution for the prevention of environmental damage by plastics and decreasing the accumulated amount of food waste. Mainly biopolymers, fibers, nanoparticles, bioactive compounds, and inorganic compounds are among the main food components that are added into sustainable food packaging solutions. The present study aimed to explore the novel applications, advantages and disadvantages of these solutions in the through the sustainability perspective.

Keywords: Packaging, sustainability, by-products

LACTOBACILLUS PLANTARUM ATCC 8014 ADAPTABILITY IN SOURDOUGH OBTAINED ON ANCIENT WHEAT SPECIES

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Introduction: Ancient cereals (einkorn, spelt, and emmer) have re-attracted consumers' interest due to their superior nutritional value, high level of bioactive compounds.
Aims. The study aims to assess the adaptability of *Lb. plantarum* ATCC 8014 in sourdough obtained from ancient wheat flours (einkorn, spelt, emmer) in order to be used in breadmaking.
Materials and Methods: Wholemeal flours (einkorn, spelt, emmer) were purchased from specialized stores in Romania. Common wheat wholemeal flour was used for the control sample. Sourdough samples were obtained by mixing each flour with water (1:0.8), while *Lb. plantarum* strain was added al level of 10^8 ufc/ml to the mixture. Samples were taken at 0, 12, 24 h of fermentation and analysed for microbial cell growth dynamics, pH and TTA (total titratable acidity), carbohydrate content, crude cellulose, minerals, organic acids and ethanol and volatile compounds.
Results: All sourdough samples recorded significant cell growth over the fermentation times with values between $0.100x10^7$-$4.1818x10^9$ ufc/g, while the pH and TTA reached after 24h values between 3.84-3.96 and 15.6-23.4 mL NaOH, respectively. The content of organic acids increased with the fermentation time, einkorn being especially noticeable among the ancient flours. Regarding the carbohydrates content, maltose was converted in glucose and fructose was used as electron acceptor or carbon source. A decrease in cellulose content was observed in all samples during fermentation due to the solubilization of insoluble fibers into soluble fibers as a result of enzymatic actions. The bioavailability of minerals has increased following lactic fermentation. In all variants of sourdough, a total of 43 volatiles were identified which were classified into alcohols, aldehydes, ketones, acids and other compounds.
Conclusion: The obtained results demonstrate a good adaptability of *Lb. plantarum* ATCC 8014 on ancient wheat flours with an increase of the bioactive compounds content in the sourdoughs.

Keywords: einkorn, emmer, *Lactobacillus plantarum,* sourdough, spelt

STUDY ON THE NUTRITIONAL IMPROVEMENT OF BAKERY-PASTRY PRODUCTS USING LUPIN FLOUR AS AN ALTERNATIVE RAW MATERIAL-REVIEW

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Introduction: One of the legumes that have received special attention in the last period due to its nutritional value and health benefits is lupin (part of the *Fabaceae* family, genus *Lupinus*) (Johnson et al., 2017). Lupin has been used in various bakery-pastry products in order to improve their nutritional quality. Furthermore, studies indicate that lupin is suitable for gluten-free bakery-pastry products (Maghaydah et al., 2013).
Aims: This study is focused on the nutritional improvement of bakery products using lupin flour as an alternative raw material. The bioactive potential of lupin and its influence on the qualitative characteristics of the products was highlighted.
Materials and Methods: The methodology of the study consists in consulting databases with specialized articles from 2010-2020.
Results: The increased addition of lupin flour influenced in a positive way the nutritional characteristics of the bakery pastry products with gluten and gluten-free, enhancing its protein, fiber, minerals, phenols, and antioxidant activity. This could be explained through the rich chemical composition of lupin and its techno-functional characteristics. Equally important, the addition of lupin flour decreased the content of carbohydrates in some products. A large variety of products, namely bread, cookies, pasta, and cake were obtained with lupin addition, thus indicating its versatility.
Conclusion: From the articles that have been studied, it has been shown that the addition of lupin flour in bakery products has considerably improved their nutritional value.

Keywords: bread, lupin, pastry

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CHARACTERISTICS OF RAW MILK FROM VENDING MACHINES IN THE TRANSYLVANIA REGION, ROMANIA

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Introduction: Milk is a source of proteins, lipids, vitamins and minerals and its quality can be as-sessed ac-cording to hygienic, nutritional, technological and sensory parameters. The main pa-rameters are: somatic cells counts, total number of germs, fat content, protein, lactose, nonfat dry matter, pH.
Aims: The aim of this study was to analyze and compare the characteristics of raw milk from vending machines in a period that includes the July-August summer months and comply qualitative standards for consumers.
Materials and Methods: Samples were collected simultaneously during a 2 year pe-riod, while the ambient temperature at the time of collection varied between 23…31 degrees Celsius at the time of collection from vending machines. The following parameters were deter-mined: total plate count (TPC), the somatic cell count (SCC), and the content of fat, protein, lac-tose, casein. All data were analyzed with R Studio soft-ware. Graphic analysis of results was performed with "vegan" package, based on both influence of year and automatic vending ma-chine and related to TNG values.
Results: Based on ANOVA test, the year has a significant influence over Fat percent of raw milk .As an opposite, dry matter and lactose, are influenced by the vending machine which represent the origin of milk. For TNG and NSC values, both year and vending machine, have a significant influence, with a greater value of vending machine. From the perspective of the interaction year x vending machine, only dry matter, fat and protein are influenced by both factors.
Conclusion: Fat and NSC is highly correlated with year, and lactose, pH, NSC and TNG are cor-related with milk provenance.

Keywords: protein, raw milk, somatic cells, total number of germs, vending machines.

METABOLIC PROFILING OF BAKERY PRODUCTS OBTAINED FROM SOURDOUGH BASED ON WHEAT FLOUR AND GERM FLOUR

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Introduction: Metabolomics is aiming to analyze the metabolome (small molecular compounds) from the systems (cell, tissue or organism). By this approach it could give deep information about food characteristics. In breadmaking metabolomics was conducted with the specific goal of identifying relationships between the raw materials, dough fermentation, aroma profile, nutritional value and bread quality improvement.
Aims: Considering the growing attention to healthier food products this research aims to analyse the metabolic profile of bakery products obtained from sourdough based on wheat flour and/or germ flour.
Materials and Methods: In order to find arguments for our hypothesis, literature study was conducted on recent articles (2015-2020). Findings and results were re-examined and reconsidered.
Results: Sourdough fermentation has the ability to improve bakery products quality. LAB and yeast fermenting activity lead to valuable bioactive compounds but also influence positively the sensorial features of the bread. Moreover, germination is also associated with the improvement of the nutritional value of the grains, especially in terms of vitamins and mineral bioavailability, antioxidant activity and decreased content of anti-nutrients. Most of the studies made until now have applied an analysis of metabolites to determine the traceability of specific metabolites (carbohydrates, organic acids, amino acids and volatile derivatives) from fermented dough substrates. It was revealed that a determining factor for bread characteristics is the interaction between the strain type and the substrate composition. By it specific composition, each composite flour will give a specific metabolic profile after sourdough fermentation depending on the type of sprouted flours and on the type of microbial strains used. Metabolomics approaches could indicate clear differences between flours and bread samples.
Conclusion: Metabolomics is a powerful tool to monitor and predict the bread quality in order to obtain products with improved health-promoting compounds.

Keywords: metabolomic profile, sourdough, sprouts

ASSESSMENT OF IODINE UPTAKE IN BIOFORTIFIED CHILLI PEPPERS

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Introduction: Among human micronutrient deficiencies, iodine is unique for the fact that its deficiency appears regardless of the economic status of the population, being prevalent in developing as well as developed countries. Iodized salt approach has several drawbacks (Gonzali et al., 2017), that is why other methods have to be used in order to supply the individuals with adequate amounts, one of them being iodine biofortification of vegetables.
Aims: Considering that chilli peppers cannot be consumed in high quantities because of their pungency as well as either deficit or sudden iodine excess can be dangerous for human health (Laurberg et al., 2010), we decided to biofortify them and to further analyse the degree of iodine uptake.
Materials and Methods: Four chili peppers varieties or cultivars of the *Capsicum annuum*, namely *Shishito var.*, *Hungarian-hot-wax var.*, *Thai dragon var.* and 'Anaheim' cultivar were cultivated in controlled conditions in phytochambers. One month after germination, they were fertigated with several iodine doses (0, 2, 5 and 12 mg I/kg soil) as KI solutions for 9 weeks. When ripen, the fruits, leaves and roots were oven-dried at 45ºC for 72h, milled into powder and iodine was analysed using the ferric thiocyanate-nitric acid catalytic kinetic method, following the sample combustion using oxygen flask method.
Results: The recovered iodine in soil was close to the added amount while the internalized iodine contented decreased in the order roots > leaves > fruits. High difference of iodine uptake into fruits was noted among the tested varieties (between 1 and 4 mg I/kg dried fruit).
Conclusion: The iodine biofortification degree in chilli peppers is highly dependent upon the used varieties.

Keywords: biofortification, chili peppers, iodine

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METHOD OPTIMIZATION AND CHARACTERIZATION OF ESSENTIAL OILS NANO-EMULSIONS

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Introduction: Citrus essential oils are complex mixtures of volatile compounds with manyfold possibilities to be used as active antioxidant and antimicrobial ingredients in food, cosmetics or pharmaceutical products.
Aims: These uses are limited by their susceptibility to external factors such as: light, temperature, pH, oxygen, and humidity. In order to enhance the physical-chemical stability of citrus essential oils, they were encapsulated into nano-emulsions.
Materials and Methods: In this study, nano-emulsions were prepared through the ultrasonication method, using citrus oils as lipidic phase and Tween 80 and ethanol as surfactant, and co-surfactant respectively. Five types of citrus oil nano-emulsions were prepared by mixing 8% (v/v) of oil phase (bergamot, tangerine, orange, pomelo and lemon essential oils) with 1% (v/v) of Tween 80, 1% (v/v) of ethanol and 90% of deionized water using a magnetic stirrer and sonication at 72 amplitudes for 15 minutes. The PDI, turbidity, morphology, volatile profile and bioactive properties were investigated and their stability was monitored under different environmental conditions (storage at room temperature, at 37^{o}C, refrigeration, freezing).
Results: Each emulsion exhibited different degrees of gravitational separation, the one stored at 37°C being the most unstable, showing coalescence. Gas chromatography mass spectrometry (GC-MS) coupled with headspace solid phase micro-extraction (HS-SPME) was used to characterize the volatile fingerprint of nano-emulsions. Based on the results obtained from the chromatographic analysis, the main compound present in all studies was D-limonene with a concentration varying between 103.804 ± 8.112 mg/kg and 172.962 ± 25.012 mg/kg. In addition, other aroma compounds specific to citrus essential oils were identified, from the class of aldehydes, terpenes and terpenoids, but in lower concentrations.
Conclusion: In the present research work, we demonstrated that nanotechnology has an important role in preserving and potentiating the properties of the bioactive compounds in citrus essential oils. In addition, citrus oil nano-emulsions represent a good alternative to chemical additives that harm the food industry and human health.

Keywords: chromatography, citrus essential oils, nano-emulsions, nanotechnology, optimization

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pH-RESPONSIVE NANOCAPSULES WITH *IN VITRO* THERAPEUTIC ACTION: ANTHOCYANINS ENCAPSULATION AND CONTROLLED RELEASE INSIDE B16-F10 MELANOMA CELLS

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Introduction: Melanoma is one of the deadliest types of skin cancer and the discovery of new targeted therapies is still a pressing issue.
Aim: This work presents a fluorescent pH-sensitive nanocarrier fabricated to deliver anthocyanins through different cellular environments, and to maintain its cargo's properties at a continuous decrement of pH.
Materials and Methods: The nanocarrier was constructed on a calcium carbonate template, with alternative addition of layers of pH-sensitive biomaterials: poly(acrylic acid) and polyethyleneimine. Anthocyanins were extracted from *Aronia melanocarpa var. viking* fruits, and characterized by chromatographic techniques. The nanosystems were analyzed with Dynamic Light Scattering (DLS), Zeta-Potential, and Transmission Electron Microscopy (TEM) for size and electrostatic potential near the surface measurements. WST-1 assay was used for the cytotoxic evaluation on B16-F10 murine melanoma cells. The cellular uptake events were captured by fluorescence microscopy.
Results: The nanoparticles were successfully assembled to have 50-300nm and positive surface. Their uptake was established by microscopy analysis and no cytotoxicity was shown according to WST-1 assay. Anthocyanins were released in media at pH 4.5 and 5.5.
Conclusions: In this study, the proposed therapeutical nanosystem proved to have efficient encapsulation yield of anthocyanins, optimal dimensions and surface charge for cellular uptake. Moreover, the anthocyanins were release from the nanocapsules in solution, on a pH-dependent manner.

Keywords: anthocyanins, fluorescent microscopy, nanocarrier system, pH-resistant, melanoma therapy

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THE INFLUENCE OF CONVENTIONAL FAT REPLACEMENT ON THE STRUCTURAL BEHAVIOR OF FIVE DIFFERENT PASTRY PRODUCTS IN THE DYNAMICS OF THE TECHNOLOGICAL PROCESS

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Introduction: Pastries are generally formulated with solid fats, such as margarine, shortening, butter or lard, which contain high levels of saturated and trans fatty acids, substances that have been identified as having harmful effects on human health. Oleogelation is a promising strategy for structuring liquid oil, which provides the functionality of solid fats and improved nutritional characteristics.
Aims: The aim of this study is to evaluate the influence of the replacement of conventional fats with oleogel, on the structural behavior in the dynamics of the technological process of obtaining pastry products.
Materials and Methods: In this research paper, puff and tender pastry have been reformulated by completely replacing conventional fats with sunflower oil, structured with 10% carnauba wax. The doughs and the corresponding finished products were subjected to rheological and textural analysis. In addition, oil losses and moisture of the finished products were determined.
Results: The results indicated that the textural and rheological properties of the doughs were influenced by the type of fat used. The hardness value for the samples formulated with oleogel varied between 2.37 N and 15.64 N, while for the samples with conventional fats between 8.83 N and 19.89 N. The storage modulus (G') were higher than loss modulus (G'') and both increased with angular frequency (Hz). The highest value of oil losses was identified for the saltines (0.18 g for conventional sample and 0.54 g for oleogel sample), while the conventional strudel (0.02 g) and cookies with oleogel (0.06 g) recorded the lowest values.
Conclusion: In addition to satisfying the need for unsaturated fatty acids, the use of oleogel has led to the pastry products with properties comparable to those formulated with conventional fats, and with a content of up to 80.86% lower in saturated fatty acids.

Keywords: oleogel, pastry products, saturated fatty acids, structural behavior, structured lipids
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WILD *ARTEMISIA ABSINTHIUM* L. - CHARACTERIZATION OF BIOACTIVE COMPOUNDS

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Introduction: Wormwood (*Artemisia absinthium* L.) is one of the many and rich species of medicinal plants of the genus *Artemisia*, used mainly in traditional medicine. In the field of food, natural extracts showed the importance of phytochemical compounds to maintain optimal health. The use and development of natural antioxidants are highly appreciated due to their role in the protection of human cells from damage caused by free radicals. Natural antioxidants, rather than synthetic antioxidants, appear to be preferred by food industry users for preventing oxidative deterioration of foodstuffs caused by free radicals.
Aims: This paper focuses on analytical methodologies, which include the extraction and characterization of active ingredients from different parts of wild *Artemisia* species. Since extraction is the most important step in the analysis of constituents present in plants, the strengths and weaknesses of different extraction techniques are discussed.
Materials and Methods: Total content of polyphenols, flavonoids, respectively antioxidant activity was determined by the spectrophotometric methods.
Results: The obtained results confirmed that both wormwood strains and leaves can serve as a good source of bioactive compounds, at the same time, a potential use in the development of such innovative supplement formulations.
Conclusion: Research in the food industry emphasizes the importance of introducing polyphenolic compounds into food, as these compounds in fruits, vegetables, herbs, which have antioxidant activity can protect the body against oxidative stress.

Keywords: antioxidant activity, bioactive compounds, natural products, wormwood

HYBRID PECTIN – SOLID LIPID NANOPARTICLES BIOFILMS FOR FOOD PACKAGING

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Introduction: Nowadays, finding an alternative solution to plastic-based food packaging is an emergency for environmental safety. Increased interest in developing novel packaging materials using polysaccharides (such as pectin) and lipids is attributed to their biodegradability, biocompatibility, low price, non-toxicity, and high abundance in nature (Pascuta and Vodnar, 2022).
Aims: The aim of this study is to develop a novel and suitable material for food packaging by using a pectin matrix enriched with rosemary oil-loaded solid lipid nanoparticles (SLN).
Materials and methods: Pectin – SLN biofilms were produced using the casting method. SLN was performed by ultrasound-assisted hot emulsification. SLN was characterized by size, polydispersity index, zeta potential, and encapsulation efficiency. The physical and mechanical properties of hybrid biofilms were determined.
Results: SLN reduced water vapor permeability by 90% and increased opacity. Thus leading to improved water and UV light barrier of pectin biofilms. Tensile strength decreased by 74%, while no significant effects on elongation at break were observed ($p > 0.05$). SLN is compatible with pectin matrices. Biofilms were water-soluble. Storage modulus and loss modulus decreased by the addition of SLN. Rosemary oil-loaded SLN had an encapsulation efficiency of ~ 93%.
Conclusion: Thus pectin – SLN hybrid biofilms are suitable for food packaging applications. Further studies to improve their mechanical properties, as well as to test their bioactivity (e.g. antioxidant and antimicrobial) and sensory effects in food matrices should be performed.

Keywords: active packaging, nanotechnology, nanocarrier, rosemary oil

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GREEN SYNTHESIS OF COLLOIDAL GOLD NANOPARTICLES USING CITRUS ESSENTIAL OILS - MORPHOLOGY, PHYSICO-CHEMICAL CHARACTERIZATION AND MICROBIOLOGICAL PROPERTIES

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Introduction: Essential Oils (EOs) have a strong focus in the scientific world these days and citrus essential oils began to show increased interest due to their antioxidant and antimicrobial properties (Bora, Kamle et al. 2020, Brahmi, Mokhtari et al. 2021). Also, nanostructures are intensely studied and exploited in various fields including the agri-food sector. Particularly, combining EOs and nanostructures can be an efficient way to improve the EOs stability and properties.

Aims: This study aims to produce colloidal gold nanoparticles by reduction of Au3+ ions with citrus EOs.

Materials and Methods: The syntheses were carried out using lime, lemon, orange, tangerine and grapefruit EOs, at boiling and pH between 8 and 9. The morphology of the nanoparticles was characterized by transmission electron microscopy (TEM) and dynamic light scattering (DLS), while their stability was assessed by UV-Vis spectroscopy and Zeta potential measurements. Their antioxidant activity (DPPH method) and antimicrobial properties were also studied. **Results:** The nanoparticles showed characteristic UV-Vis absorption maxima between 521-547 nm, depending on the EO used as reducing agent. The diameter of nanoparticles was in the range of 13- 23 nm. Zeta potential values indicated a strong stability in time of the colloid and this has been also confirmed by UV-Vis spectroscopy at 6 months after production.

Conclusion: In the present work we successfully achived gold nanoparticles by green synthesis with citrus essential oils with sizes between 13 and 23 nm and strang stability in tine with potential use in active packaging for food industry

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Keywords: antioxidant, citrus essential oils, gold nanoparticles, DLS

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COLD PRESSED PUMPKIN SEED OIL FATTY ACIDS, CAROTENOIDS, VOLATILE COMPOUNDS PROFILES AND INFRARED FINGERPRINTS AS AFFECTED BY STORAGE TIME AND WAX BASE OLEOGELATION

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Introduction: Cold pressed pumpkin seed oil is rich in bioactive compounds, but is prone to oxidation. The constituent fatty acids, carotenoids and volatile compounds were studied at fresh state (T1) and during one (T2), five months (T3), and eight months (T4) storage to assess the overall quality.
Aims: Assess if oleogelation with 5% wax mixture hinders the degradation of the pumpkin oil and its carotenoids and comparing overall quality with a refined sunflower oil.
Materials and Methods: The fatty acids were analyzed by GC-MS. HPLC was used to determine the specific carotenoids. Volatile compounds profile was determined by in-tube extraction gas chromatography–mass spectrometry. Infrared spectroscopy was performed to assess oxidation.
Results: In the cold pressed pumpkin seed oil, lutein was detected in amount of 0.55 mg/100 g oil and β-carotene was 0.17 mg/100 g and oleogelation protected cartotenoids during storage. The linoleic acid was predominant in the composition of the cold pressed pumpkin seed oil and oleogel, along with oleic acid. Hexanal and heptanal were detected during storage in both oil or oleogel samples, regardless of the oil type. FTIR analysis confirms that the differences in the constituent fatty acids are determining the oxidative state of the samples.
Conclusion: Oleogelation is a good technique for protecting fatty acids and carotenoid compounds. Despite this, oxidation during storage was more intense in the cold pressed pumpkin seed oil in comparison to the sunflower oil.

Keywords: carotenoids, fatty acids, oleogels, oxidation, pumpkin seed oil

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EFFECT OF TYPICAL FOOD PROCESSING ON PHENOLIC COMPOUNDS IN APPLE POMACE

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Introduction: Apple juice is one of the most consumed fruit juices in the world. However, the apple pomace obtained after juice production is currently only a by-product and is usually discarded. Phenolic compounds in particular are known for their antioxidant effect, their implementation in food promises health benefits.
Aims: The aim of this work is the identification and quantification of the phenolic compounds from apple pomace and the investigation of their stability during food processing.
Materials and Methods: Apple pomace was produced from Red Delicious cultivar, and then three types of were used, thermic, high pressure and, pulsed electric field treatment. The measurements were done using Folin-Ciocalteu assay, HPTLC, LC-MS/MS, EPR, and TEAC assay.
Results: The total phenol content was 5.4 - 18.8 mg gallic acid equivalent per g pomace. The compounds chlorogenic acid, phloridzin and epicatechin detected in the pomace were broken down the most by high-pressure treatment at 600 MPa and 121 °C. The antioxidant activity was between 630.9 - 1430.9 mg Trolox equivalents per 100 g apple pomace. PEF treatment was an exception, since the degradation products showed a lower antioxidant activity compared to the other treatments.
Conclusions: The results of this work help to assess the degradation of extracted phenolic compounds through typical food processing steps in order to be able to incorporate them into foods as health-promoting additives.

Keywords: apples, polyphenols, degradation

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COMPARATIVE DETECTION OF Campylobacter spp. FROM POULTRY MEAT

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Introduction: This research paper draws attention to the microbiological risk represented by Campylobacter spp. in poultry meat destined for public consumption in relation with the time of detection and identification. The speed of detection of pathogen germs has a decisive impact on the prophylaxis and prevention measurements regarding the introduction for consumption of contaminated meat.
Aims: This study is a strong argument that aims to unveil the advantages of rapid diagnosis methods in meat microbiology, according to the standardized and classical methods.
Materials and Methods: The analyzed matrix is raw meat. There were five different meat samples, each consisting of five other units. For each unit were used groups of negative and positive control. CE Regulation nr. 1494/2017.
Results: The fast detection of the bacteria was completed in 48 hours from the beginning of work with samples, whereas the classical method needed 96 hours. A fast result can also be obtained from biochemical confirmations through the alternative method, in comparison to the classical one.
Conclusion: The results prove the fact that the research used alternative method represents the rapid solution in the field of meat microbiology, but being in line with the classical one. The advantage of the rapidity of the analysis benefits both the food industry operator and especially the final consumer.

Keywords: Campylobacter, detection, microbiological, rapid, results.

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PRELIMINARY RESULTS ON THE RECOVERY OF COENZYME Q10 FROM VEGETABLE AND ANIMAL WASTE

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Introduction: Most animal-originated foods, such as meat, egg, and dairy products, are critical sources of Coenzyme Q10 (CoQ10) (Bae *et al.*, 2018); other available food sources include vegetable oil, fish, bee pollen and microorganisms (Pyo, 2010).
Aim: This work involved the recovery of CoQ10 from vegetable and animal waste for possible utilization as a food supplement.
Materials and Methods: Six different press cakes resulting from the cold extraction process of rapeseed, sunflower, pumpkin, linseed, walnut, and hempseed oils, respectively, minced samples of whole fish and chicken hearts, have been tested for CoQ10 content using the ultrasonic extraction with 2-propanol.
Results: Pumpkin press cake showed the highest level of CoQ10 (84.80 µg CoQ10/g material) among the vegetable waste studied and chicken heart (114.39 µg CoQ10/g material) among the animal ones.
Conclusion: The ultrasound-assisted extraction using 2-propanol is suitable for recovering CoQ10 both from vegetable and animal matrices; it is simple to perform and environmentally friendly.

Keywords: chicken heart, coenzyme Q10, extraction, press cakes, whole fish

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IMPACT OF THE COVID-19 PANDEMIC ON NICHE DAIRY PRODUCTION - A CASE STUDY

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Introduction: The limitations brought about by the pandemic of COVID-19 have impacted practically all financial areas of various nations, including the dairy sector. Worldwide isolation and lockdown measurements confronted the entire humankind with issues like food availability. Restrictions, curfews, and social distancing limitations led to reduced productivity and competitiveness in the dairy sector, disrupting the supply chain, reducing services, additional limitations and delays (Acosta et al., 2021; Rahimi et al., 2022; Weersink et al., 2020).
Aims: The research focuses on the impact of the pandemic on niche dairy production in the Transylvania area of Romania, more precisely, the Năsal cheese variety produced by a local cooperative.
Materials and Methods: The review time frame composes of pre-pandemic parameters recorded *in-situ*, at the time of the production of each batch of the niche dairy product, the Năsal cheese variety.
Results: The impact of the CODID-19 pandemic upon production of a small, local cooperative had surprising results in regard to the total volume of processed raw goods. Looking a pre-pandemic levels, we saw an increase in the total volume of processed raw goods during the pandemic lockdown.
Conclusion: In the case of time-sensitive products like milk, limited options for small milk producers compelled them to sell the milk locally, thus increasing the total volume of processed raw goods during the pandemic lockdown.

Keywords: COVID-19 pandemic, dairy production, Năsal cheese

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THE IMPACT OF UNCONVENTIONAL RAW MATERIALS IN BEER AND BEER-LIKE METABOLOMICS

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Introduction: The third most consumed beverages worldwide are beer, being surpassed only by water and tea, but still the first in the top of alcoholic beverages. Due to high beer consumption, last year came with a growing interest about diversification and innovation in the field of brewing, among producers and researchers alike. The use of unconventional raw materials has become a subject studied exhaustively in order to develop beers and beer-like products with unique characteristics that are pleasing to the consumer.
Aims: This work aims to classify and present unconventional raw materials used in previous scientific studies, as well as to identify the use and the effect that these ingredients have on the metabolomics of beer and beer-like beverages. A trend has been observed in the use of unconventional raw materials in order to enrich beer and beer-like products with functional characteristics.
Conclusion: Unconventional raw materials used in brewing were among the most varied products. However, the general trend is to use locally available ingredients. In addition, the use of ingredients that have functional characteristics is also a general trend. Among the most studied functional features are phenolic compounds and antioxidant activity. The most commonly used adjuvant category is by far the fruit category. This is directly related to the interest in polyphenolic and antioxidant value as fruits are particularly important sources of these features. Other important sources used in brewing were plants, some sources of starch or even propolis and spices. On the other hand, unconventional raw materials have been used in order to enrich the sensory profile or to create new features.

Keywords: adjuvants, beer, functional, metabolomics, raw materials

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PRETREATMENTS AND BIOPROCESSES FOR INCREASING THE BIOACCESSIBILITY AND BIOAVAILABILITY OF CEREAL BRAN PHYTOCHEMICALS

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Introduction: Current research focuses on improving the bioaccessibility of functional components bound to cereal bran cell walls. The main bioactive components in cereal bran that have major biological activities include phenolic acids, biopeptides, dietary fiber, and novel carbohydrates. Because of the bound form in which these bioactive compounds exist in the bran matrix, their bioaccessibility is limited.
Aims: This paper aims to comprehensively analyze the functionality of an integrated technology comprising the pretreatment techniques applied to bran substrate followed by the fermentation bioprocesses to improve the bioaccessibility and bioavailability of the functional components.
Conclusion: The integrated technology of specific physical, chemical, and biological pretreatments coupled with fermentation strategies applied to cereal bran previously pretreated substrate provide a theoretical basis for the high-value utilization of cereal bran and the development of related functional foods and drugs.

Keywords: bioactive compounds, cereal bran, fermentation, integrated technologies
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MULTIMODAL RESVERATROL-DELIVERY THERANOSTIC MICROSYSTEM FOR THE MANAGEMENT OF DIABETIC RETINOPATHY

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Introduction: Diabetic retinopathy (DR) is one of the most common eye diseases that affect people's quality of life. In search of new therapeutic molecules, resveratrol (Rv), a natural stilbene from plants, has demonstrated anti-angiogenic and antioxidant properties. However, its encapsulation to increase the stability and bioavailability is highly desirable.
Aim: This research aimed to develop and validate a theranostic microplatform for targeting the vascular endothelial growth factor (VEGF) protein in the human retina and for local and controlled release of Rv under near infra-red (NIR) laser exposure.
Materials and Methods: Starting from a $CaCO_3$ core, alternate layers of negative poly(sodium styrene sulfonate) (PSS) and positive polyethylenimine (PEI) polymers were attached *via* the Layer-by-Layer technique (LbL). Rv was integrated on the surface of the core, while fluorescein isothiocyanate (FITC) and gold nanoparticles were entrapped between the polymeric layers. The physical characterization of the microcapsules was done by dynamic light scattering (DLS) and electron microscopy techniques. The encapsulation efficiency of Rv was measured by high performance liquid chromatography (HPLC). The internalization process inside human retina pigmented epithelial (RPE) D407 cells was monitored by fluorescence microscopy and the WST-1 reagent was used to calculate the cytotoxicity of the microsystem.
Results: Having a stable spherical shape and a diameter of 2.5 µm, the microcapsules integrated Rv with an efficiency of over 90%. Their good photothermal performance was recorded after ex-*vivo* irradiation at 785 nm and 808 nm. Intracellular monitoring was successfully demonstrated after a 24 h treatment. No cytotoxicity of the microcapsules toward D407 RPE cells was detected.
Conclusion: This novel drug-delivery theranostic microsystem has the potential to improve current DR treatment methods.

Keywords: diabetic retinopathy, polymeric microcapsules, resveratrol

Acknowledgement: This research was funded by the Romanian National Authority for Scientific Research, CNDI - UEFISCDI, project number PN-III-P2-2.1-PED-2019-4558, contract no. PED 369/2020.

IRON OXIDE NANOPARTICLES CARRIED BY PROBIOTICS IN IRON ABSORPTION

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Introduction: Recently, newly generated iron oxide nanoparticles (IONPs) carried by probiotics have been recommended as innovative iron supplements due to their low reactivity and high bioavailability compared to conventional anemia treatments (Elshemy, 2018; Garces et al., 2018).
Aims: Concretely, our aim was to pursue focus research objectives (O): O1- examine the research profile of studies on IONPs synthesis; O2- determine, apprehend and appraise the emphasis areas in the current literature on IONPs' probiotics interaction; O3- critically evaluate emerging approaches, purposely emphasize incongruity in the present scientific literature and propose probable research questions; and O4- design a framework that researchers can use to comprehend the outline of IONPs probiotic systems.
Materials and Methods: To reach the proposed research objectives, a systematic literature review approach is used to determine, analyze and critically review the actual studies.
Results: Due to the probiotic's capacity to connect with the intestinal walls, IONPs-bacteria incorporate into the enterocyte, where nanoparticles are given, providing an adequate iron content (Garces et al., 2018; Hashem et al., 2018).
Conclusion: We conducted a systematic literature assessment of the effects of IONPs interacting with probiotic cells on iron absorption, bioavailability, microbiota balance, and associated side effects. Since IONPs carried by probiotics may play a key role in IDA therapy, research and development in this area need to increase. As a result, iron oxide nanoparticle-based diagnostics, medicines, and devices are expected to become common in clinical practice within the next two decades.

Keywords: absorption, iron oxide nanoparticles, cytotoxicity, probiotics

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ITACONIC-ACID-BASED ACTIVE PACKAGING ENRICHED WITH APPLE POMACE-DERIVED ANTIOXIDANTS

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Introduction: In the food packaging industry, producing environmentally friendly, biodegradable and active packaging is an emerging aspect that is non-polluting and additionally increases the shelf-life of products and confers enhanced quality.
Aims: This study aimed to develop itaconic acid (IA)-based active films using Poly(vinyl alcohol) -PVA, pectin and enriched with apple pomace (AP) extracts (organic and phenolic) for food packaging applications while determining their morphologic and mechanical properties.
Materials and Methods: Combining these biopolymers and integrating AP extracts from fresh by-products and lyophilized AP efficient film solutions were obtained, with high antioxidant activity. After the rheological characterization of these film-forming solutions, the solid films were also analyzed through physical measurements, water vapour permeability, and water solubility test.
Results: The antioxidant activity was as follows, 9.70 ± 0.078, and 78.61 ± 0.24 uM Trolox/100 g fresh AP weight, and 67.45 ± 0.28, and 166.69 ± 0.47 uM Trolox/100 g lyophilized powder weight respectively. Moreover, the integration of IA and AP extracts had beneficial effects on the films' physical-chemical characteristics (thickness, diameter, mass, and density) and gave mechanical resistance against extrinsic and intrinsic factors, with low water vapour permeability and decreased solubility in water.
Conclusion: Both biopolymers could be efficiently applied in the food packaging sector, but further research is necessary to identify the optimal applications for the proposed formulations.

Keywords: apple pomace extracts, biopolymer, lyophilization, rheological properties

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SUSTAINABLE VITAMIN B12 FORTIFICATION OF CEREAL BY-PRODUCTS

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Introduction: The present trend of substituting animal-based food for plant-based food results in a reduction in global dietary vitamin B12 intake, whereas there are limited plant-based food products fortified with vitamin B12 as this research direction is in its early stage [1].
Aims: In the present study, the use of *Propionibacterium freudenreichii* is critically reviewed as the only food-grade strain able to synthesize DMBI starting from naturally present riboflavin in wheat and oat bran in order to produce the active form of vitamin B12 under solid-state fermentation conditions.
Materials and Methods: This research work is based on multidisciplinary domains from literature comprising significant numbers of research articles, all gathered in a review paper focusing on the *in situ* fortification of vitamin B12 in cereal by-products.
Results: *Propionibacterium freudenreichii* and *Pseudomonas denitrificans* are the most commonly employed bacteria in vitamin B12 industrial production. However, there is limited research on natural in situ fortification of vitamin B12 in cereal by-products.
Conclusion: The vitamin B12 fortification is an emergent research to deliver the previously untapped potential for naturally fortifying plant-based foods with vitamin B12, while valorizing and offering an eco-sustainable approach for cereal industry wastage rate.

Keywords: eco-sustainable, fortification, solid-state fermentation, vitamin B12

Acknowledgement: This work was supported by a grant of the CNCS-UEFISCDI, project number PN-III-P1-1.1-TE-2021-1052, 7TE/2022.

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METHOD OF OBTAINING EGGS ORODISPERSIBLE POWDER OVOIMUNO - NATURE AND TECHNOLOGY TOGETHER

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Introduction: Among the gifts of nature, egg is considered a cocktail of active principles, of nutritional and biological elements that ensure the formation and development of a new life.
Their bioavailability is limited when we consume the egg, both for culinary preparation and digestion.
Aims: In order to capitalize on the natural, bioactive elements of the egg, we have sought solutions to conserve and protect them, so as to ensure their bioavailability in order to obtain nutritional supplements. The main element of interest is IgY, the phylogenetic precursor of mammalian Ig G, with its structure and functions.
Material and methods: The method of obtaining OVOIMUNO formulas, orodispersible powders from eggs, consists in the simultaneous application of two anabiosis processes: xeroanabiosis and osmoanabiosis. Xeroanabiosis was performed by lyophilization technique. To create osmoanabiosis we add natural sugar / carbohydrate preservatives (sucrose, honey, maltodextrin, palm sugar, agave syrup etc.) were selected.
Results: The applied biotechnological processes have acted on the water content and on its activity, protecting the compounds of interest. In this way, original, orodispersible, natural food supplements were formulated, without the addition of chemicals, stable organoleptic, microbiological and physico-chemical.
Conclusion: In the present research we obtained orodispersible powder with immunoglobulins Y from eggs by applying two combined processes of anabiosis with superior palatability -orodispersibility, intended for nutritional and immune support.
OVOIMUNO formulas can support proper functioning and maintain the health of tissues and organs, diminishing the effects of stressors on the body.

Keywords: immunoglobulins Y, orodispersible, osmoanabiosis, water activity, xeroanabiosis

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THE ANTIOXIDANT ACTIVITY OF MONOFLORAL HONEY AND ITS AWARENESS AMONG URBAN CONSUMERS IN SLOVAKIA

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Introduction: Honey is very rich in biological activity such as antioxidant activity, antifungal activity, antiviral activity and antibacterial activity. Moreover, it contains around 70 substances including various minerals, volatiles compounds, vitamins, carbohydrates amino acids or organic acids (Gulevska and Martinovski, 2018).
Aims: The main objective of the interdisciplinary research was to study the antioxidant activity of selected monofloral honeys produced in Slovakia as well as to identify awareness of biological activity of honey among honey consumers living in urban areas.
Materials and Methods: Study is based on marketing research conducted on 1940 honey consumers living in Slovak urban areas. Questionnaire focused on consumption patterns, purchasing behaviour as well as consumer awareness towards biological and nutritional properties. Moreover, 37 honey samples were tested on antioxidant activity. Honeys were analysed for antioxidant activity by DPPH method and total polyphenol content by spectrophotometric method using Folin-Ciocalteu reagent. The samples comprised Slovak monofloral types such as rapeseed honey, acacia honey, linden honey, sunflower honey, honeydew honey and buckwheat honey.
Results: The results showed that the lowest antioxidant activity was detected in acacia honey while the highest was conformed in buckwheat honey followed by honeydew honey and sunflower honey. Urban consumers mostly prefer honeydew honey or acacia honey. The main criteria used in the honey buying process are quality, country of origin and regional aspect (local honey). Only 57,5% of respondents are aware of antioxidant activity of honey and nearly 13% is not aware of any biological activity.
Conclusion: The results of both consumer research and analytical research (antioxidant activity) provides an important information for beekeepers in terms of honey marketing and nutrition marketing.

Keywords: antioxidant activity, consumer research, monofloral honey, knowledge

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EVALUATION OF THE *ASTRAGALUS EXSCAPUS* L. SUBSP. *TRANSSILVANICUS* ROOTS CHEMICAL COMPOSITION AND BIOLOGICAL ACTIVITIES

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Introduction: The plant-derived bioactive molecules gained substantial interest nowadays in the prevention and/or treatment of different non-communicable diseases. The need to find novel and natural molecules for pharmaceutical applications prompt research in underexplored environments.
Aims: The present study aimed to perform an essential characterization of the *Astragalus exscapus* ssp. *transsilvanicus* roots (*Astra*) by proximate analysis, to examine the phenolic composition of the root extracts by HPLC, to investigate the fatty acid profile of the *Astra* oil by GC-MS, and to evaluate the biological activities of the extracts by determining the antioxidant, antimicrobial and cytotoxic capacities.
Results: The primary bioactive compound identified in each *Astra* extract (ethanol, methanol and water) was triterpene Astragaloside IV with values ranging between 389–425 µg/g. The GC-MS profile of *Astra* oil showed a ratio of 2.19 between (ω-6) and (ω-3) fatty acids, comparable to canola oil and hempseed oil. The extracts presented moderate antioxidant activities determined by DPPH, TPC and TFC along with consistent antimicrobial properties on *Staphylococcus aureus* and *S. epidermidis* with a minimum inhibitory concentration of 0.371 mg dry weight/mL.
Conclusion: The cell proliferation and cytotoxicity tests highlighted the remarkable efficiency of the treatment in inhibiting the proliferation of B16F10 melanoma cells and its safety on regular cell lines, such as Hs 27 fibroblasts, demonstrating the site-specific and targeted action of the *Astra* extract.

Keywords: antimicrobial, *Astragalus memebranaceus;* cell proliferation assay; HPLC

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ACTIVE PACKAGING - BIOPOLYMER-ENRICHED POLY(VINYL ALCOHOL) FILMS

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Introduction: The main role of food packaging is to maintain the quality and safety of food in all post-packaging phases (transport and storage). Plastic packaging complies with these requirements but has a significant impact on environmental pollution.
Aims: Since plastic packaging has a major impact on environmental pollution, this study aimed to develop biodegradable, economical, and edible packaging that acts as an antibacterial barrier on food surfaces.
Materials and Methods: The active biofilms were prepared from polyvinyl alcohol (PVA) with the addition of itaconic acid (IA) and chitosan (Ch) and enriched with tomato by-products extracts (TBE). Also, we investigated the physical and antimicrobial properties of the two biopolymers (Ch, IA). The tomato extract (TBE) was rich in carotenoids and phenolic compounds, determined through the Folin-Ciocâlteu method.
Results: TBE-containing samples presented noticeable improvements in physical properties (diameter, thickness, weight, density) compared to control biofilms (consisting of PVA + Ch, respectively PVA + IA). TBE and Ch biofilms possess antibacterial properties; the best inhibition was against S. aureus and P. aeruginosa, with a minimum inhibitory concentration (MIC) of <0.078 mg DW / mL. Moreover, PVA and IA films have antimicrobial activity against P. aeruginosa (2.5 mg DW / mL). Regarding the total phenolic content, the PVA-Ch-TBE films presented the highest values.
Conclusion: Based on the obtained results, it can be stated that PVA-Ch-TBE films can be used to develop active systems suitable for food packaging

Keywords: active food-packaging, by-product, carotenoids, chitosan, poly(vinyl alcohol)

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SESSION 4 and 10: HORTICULTURE, FORESTRY AND GEODESY

PARTICIPATORY PLANT BREEDING AS A STRATEGY TO A MORE DIVERSE, SUSTAINABLE AND RESILIENT AGRIFOOD SECTOR: EXAMPLES OF INITIATIVES AIMED AT ORGANIC FARMING

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Introduction: In recent years, society has become aware of the effects of climate change and the sustainability of the planet, as well as food security. In this sense, various social actors and institutions (from the EU Comission to local/regional governments) are betting on more sustainable and resilient production systems, like organic farming and varietal diversification.
Aims: Illustrate in the context of several European, national or regional research projects and initiatives of local farmers, how participatory plant breeding (PPB) can provide efficient solutions to achieve more diverse, resilient and sustainable agri-food systems and also, empowering farmers and consumers and increasing social justice.
Materials and Methods: A range of plant materials (heterogeneous materials, ecotypes, landraces) from different target crops (e.g. tomatoes, peppers, brassica, carrots) under PPB activities within different projects and initiatives aimed at organic farming. According to the context and breeding objectives of each initative/crop, the number of actors involved may vary (breeders, laboratories, farmers, consumers, chiefs, retailers, local governments, etc.).
Results: PPB activities enabled to identify and bred many varieties and plant populations with a satisfactory adaptation to organic farming, quality and/or adaptation to the preferences of consumers, farmers and other socioeconomic actors. Also, these activities have strengthened the links between the actors, in particular farmers, breeders and consumers.
Conclusion: PPB has been proved to be an efficient tool to develop plant materials adapted to organic farming and to diversify the agrifood sector, by widening the number of varieties within each crop and even the diversity within population (i.e. heterogeneous materials). Moreover, this approach improves the relationships among the socioeconomic actors and proximity markets.

Keywords: agrobiodiversity, GC/MS, genetic erosion mitigation, HPLC, participatory networks.

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COMBINED EFFECT OF BIOCOMPOST AND BIOSTIMULANT ON ROOT CHARACTERISTICS OF *CANNABIS SATIVA* L.

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Introduction: *Cannabis sativa* L. is a versatile herbaceous crop and its cultivation is linked with numerous products in textile fiber, food, seed oil, and medicine sectors. Incorporation of earthworm in bio-composting (vermi-composting) has been gaining momentum as a technology for bio-waste management for producing a nutrient rich organic fertilizer. In addition, the use of seaweed extracts as biostimulants alter physical, biochemical and biological properties of the soil and may also affect the architecture of plant roots facilitating efficient uptake of nutrients and result in higher plant development and yields.
Aims: This study aimed to evaluate the combined effect of biocompost and biostimulant on the development of the root system of cannabis (*C. sativa* L. cv. Ferimon) plant.
Materials and Methods: An outdoor pot experiment was set up at Agricultural University of Athens from August until September 2021. The experiment followed a completely randomized design (CRD), with five treatments including untreated (control), vermicompost, vermicompost amended with seaweed-based biostimulant, vermicompost mixed with spent mushroom substrate (SMS) and cattle manure (CM), and vermicompost mixed with SMS+CM and amended with seaweed-based biostimulant.
Results: The results of this study showed that root length density, root diameter and N content in roots significantly increased after the combination of biocompost and biostimulant the highest values (1.36 cm cm^{-3}, 1.29 cm and 1,23%, respectively) were found after the application of vermicompost mixed with SMS+CM and amended with seaweed-based biostimulant.
Conclusion: The findings of the present study imply that the use of vermicompost mixed with SMS+CM and amended with seaweed-based biostimulant is recommended for increased biomass production which is important in the processing of cannabis for medicinal purposes.

Keywords: Cannabis, root length density (RLD), seaweed-based biostimulant, spent mushroom substrate (SMS), vermicompost

NON-GMO COMPOSITE SUNFLOWER PLANTS GROWING SYSTEM, A SMALL STEP TOWARD GAINING DROUGHT TOLERANT PLANTS

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Introduction: Root traits are very important for the way in which plants are coping with hydric stress, a problem that becomes acute in recent years. *Rhizobium rhizogenes* can naturally transform plant cells, inducing roots growth. The transformation of hypocotyl produces the so called composite plants, which have the transformed roots (Ri roots) and wild type shoots. This system was already established for sunflower, but only in the context of using transformed bacteria carrying selection or reporter genes (Parks and Yordanov, 2020).
Aims: We started to develop an experimental non-GMO transformation system of sunflower with *R. rhizogenes* allowing the monitoring of root growth and subsequently the functioning of the transformed roots.
Materials and Methods: After co-cultivation with wild type *R. rhizogenes*, young sunflower hypocotyls were placed in a hydroponic culture in order to allow the monitoring of plant growth.
Results: Hydroponic culture of plantlets in inverted black pots of appropriate dimension facilitates both, the growing of roots in the dark and easy access for performing the necessary genetic, morphological and physiological analyses of the roots, with the smallest interfering effect. The remaining challenge is to increase the ratio of Ri roots of transformed plants.
Conclusion: The model presented in this paper enables the study of Ri roots in sunflower aiming the finding of root traits, e.g. length, biomass, architecture, indicators for tolerance to drought in sunflower.
Acknowledgements: This work was supported by FACCE-JPI and RootsPlus, a SusCrop – ERA-NET project funded by the national funding agencies of partner countries, including the Executive Agency for Higher Education, Research, Development and Innovation Funding (*UEFISCDI*).

Keywords: genetic analysis, hydroponic culture, root traits

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RESISTANCE EVALUATION OF FIVE VARIETIES OF COWPEA AND THEIR F1 DESCENDANTS FROM A DIALLEL CROSSING TO COWPEA APHID-BORNE MOSAIC VIRUS IN BURKINA FASO.

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Introduction : Cowpea is a dual-purpose protein crop which has a high nutritional value (Nacoulma, 1996). However, many problems such as cowpea aphid-borne mosaic virus limit its production (Barro, 2013).
Aims: This study aimed at assessing the resistance of varieties of cowpea to cowpea aphid-borne mosaic virus (CABMV).
Material and methods: Thus, a complete diallel cross between five cowpea varieties was done in a partially balanced incomplete block plan (alpha design) with three replications. The F_1 descendants obtained and their parents were evaluated using five characters.
Results: Results obtained reveal that all characters discriminate the parents and F_1 descendants. All five parents tested revealed their resistance or susceptibility status to CABMV. The F_1 descendants from the cross between local Gorom x KVx640, KVx30-309-6G x KVx396-4-5-2D, KVx61-1 x KVx640, KVx640 x local Gorom and KVx640 x KVx61-1 which have shown a low severity value and a high weight of one hundred seeds are the best.
Conclusion: They could be used in Burkina Faso' cowpea breeding program to develop resistant varieties to cowpea aphid-borne mosaic virus.

Key words: cowpea, severity, resistance, virus, Burkina Faso.

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DEVELOPMENT OF GIS AND WEB MAPS IN ORDER TO EXTEND WATER SUPPLY AND SEWERAGE INFRASTRUCTURE IN LECHINTA VILLAGE, IERNUT TOWN, MURES COUNTY

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Introduction: In Romania's most rural parts, the urban networks are not sufficiently developed. In order to improve the living standards of the inhabitants of Lechinta village, Iernut city, Mures county, it is necessary to extend water supply and sewerage infrastructure.
Aims: For a better visualization and understanding of the interest area, a database was created in which the constructions, buildings, electrical and optical fiber networks, infrastructure and access ways were digitized.
Materials and Methods: Considering the created database and the digital elevation model of the terrain, it was possible to easily design the water supply and sewerage infrastructure that allowed a better management of the field measurements. In order to ensure a higher degree of details, but also to complete and verify the measurements made with GPS receivers, photogrammetric and LiDAR data were obtained using a UAS equipped with the TopoDrone LiDAR 100 Lite sensor and the Zenmuse X4S DJI camera. The field data were imported into the ArcGIS application and
analyzed in order to achieve the water supply and sewerage infrastructure.
Results: In order to visualize the digitization of the elements in the field, web maps were made using ArcGIS online application. The first map allows a 3D view of the area of interest and the second map includes 5 applications: database visualization, selection of desired layers, determination of distances and surfaces, use of different basemaps as well as sharing information through email, Facebook, etc.
Conclusion: Database and webmaps that were created contribute to an easier design of urban networks and the visualization
of the land in real time.

Keywords: GIS, web map, water supply and sewerage infrastructure.

POTENTIAL AND LIMITATIONS OF VEGETATION INDICES USING REMOTE SENSING IMAGERY IN PRECISION FARMING

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Introduction: Remote sensing imagery produce a huge amount of data and is an important source for the study of soil cover, for the identification of crops, their vegetation stage, cropland mapping etc. Due to atmospheric conditions, type of sensors, type of vegetation, stage of vegetation, resolution of image, up to date there is no universal accepted mathematical expression that can define a vegetation index and work with accurate results for each image obtained from remote sensing.
Aims: The aim of this paper consist in obtaining thematic maps that identifies different types of land cover, using vegetation indices and correlate the results with the control points.
Materials and Methods: The area of interest consists in the hilly area in the surroundings of Cluj-Napoca. Raw date were obtained from Sentinel 2 A2L (July 2021) with a 10 meters resolution. Most of the analysis were performed using ArcGIS software
Results: Effective decisions are based on the accuracy of vegetation indices. In the scientific literature, there are over 100 types of vegetation indices (Xue and Su, 2017).
The considered indices are: (i) RVI used for green biomass estimation and monitoring especially dense vegetation, (ii) DVI that is very sensitive in soil background with high applicability in environmental vegetation index, (iii) PVI that is less sensitive to atmospheric condition, but is more sensitive to low vegetation reflexivity, (iv) NDVI that is sensitive to soil brightness, soil colour, cloud shadow, leaf canopy shadow, (v) SAVI try to eliminate the shortcoming of PVI and NDVI due to soil background and soil vegetation.
Conclusion: The thematic maps obtained using geographical information system are very powerful tools in this type of analysis, but each image must be analysed independently using the vegetation index that is more adaptive to the particularity of the image.

Keywords: GIS, Remote Sensing, Vegetation Indices

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TECHNOLOGIES OF AFFORESTATION FOR SOME AGRICULTURAL LANDS IN THE APUSENI MOUNTAINS

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Introduction. The Apuseni Mountains are a mountainous complex, massive, well framed by large depressions (to the west the Pannonian Depression, with gulf depressions that penetrate deep into the mountainous space, to the east the Transylvanian Depression, to the north the depression area of the Someş). From a geographical point of view, the territory is part of the Carpathian-Transylvanian Unit I, Western Carpathian Land, Apuseni Mountains Subland, Bihor Mountains District.

Material and method. In order to achieve the goal, three areas adjacent to the forest fund were analyzed, within the radius of Someșu Rece, Răchițele and Valea Drăganului localities. The works consisted of making some observations regarding the natural framework of each surface, namely the collection of soil samples, in order to analyze them in the pedology laboratory (Dănescu et al., 2010). Based on the results, and the study of vegetation and climates, seasonal mapping was done (Dănescu et al., 2010), the type of forest, and afforestation technologies were determined.

Results. Within the surface of the Someșu Rece area, the soil type is *lithic districambosol*, the mountain beech forest type with Luzula luzuloides (i-m), and afforestation composition *6 Fa (Pam) + 4 Mo (La, Pi)*. Within the surface of the Răchițele area, the soil type is *subskeletic districambosol*, the forest type beech on brown and yellowish-brown soils, moderately acidic, and the forestation composition is *6 Fa (PaM, Ulm)+4 Mo (Br)*. In the area of Valea Drăganului, the soil type is subskeletal districambosol, the mountain beech forest with Luzula luzuloides (i-m), and the forest composition is *6 Fa (Pam) + 4 Mo (La, Pi)*.

Conclusions. The afforestation formulas in the three surfaces are very close, the differences being dictated by exposure and slope.

Keywords: afforestation, soil, mountain

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THE EFFECTS OF FREEZING RAIN ON FOREST STANDS ADMINISTERED BY ZALĂU FORESTRY DEPARTMENT DURING 2014-2022 PERIOD

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Introduction: Freezing rain is a rare and extremely dangerous meteorological phenomenon, consisting of the fall of liquid precipitation, while the air temperature at ground level falls below 0 °C, favoring the freezing of raindrops and forming an ice sheet on the surfaces on which they are deposited. In Romania, the areas affected by the freezing rain phenomenon undergo significant changes regarding the structure and composition of the forest vegetation. Constandache *et al.* (2018).
Aims: The main purpose of this work is to manage the forest stands affected by the freezing rain identifying optimal solutions for ecological reconstruction and prevention of significant damages.
Materials and Methods: For the research of the affected areas, we placed 7 experimental areas, having the size of 500 m^2, all the trees that were in this radius were inventoried.
Results: In this research work we evaluate the presence of this phenomenon which was reported in the Stejarul Zalău Forest District, in 2014, then in 2017, but with a lower intensity. Out of a total of 1627.6 ha, 500 ha were affected by the freezing rain, most of them being surfaces with beech forest stands with a consistency of 0.9, having a high slenderness index. Beech is the dominant species and also the most severely affected.
Conclusion: The factors that influenced the impact and effects of freezing rain are closely related to: age, diameter, height, slenderness coefficient, consistency, composition, slope and exposure.

Keywords: beech, freezing rain, meteorological phenomenon.

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URBAN DOMESTIC GARDENS: CHARACTERISTICS AND CONTRIBUTIONS TO URBAN GREEN SUSTAINABILITY

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Introduction: Domestic gardens (e.g. home, allotment) are important features of the urban green infrastructure and represent significant component of the urban landscape. Urban green infrastructure (GI) is an effective approach to enhance urban adaptability to environmental changes, to promote ecosystem services by green spaces and facilitate circular economy by providing bio-products for personal benefits.
Aims: To evaluate the role and benefits of urban allotments and home gardens within the urban green infrastructure in the Global North countries.
M**aterials and Methods:** A literature review was performed to identify published evidence on the impact of domestic gardens for GI sustainability within the Global North countries from 2000 onwards. A narrative synthesis method was adopted to interpret available research pertaining to urban domestic gardens *per se*, to define their unique role in GI and to highlight areas in need of further research.
Results: The review suggested key differences in both form and management of urban domestic gardens which substantially affect their implications for GI sustainability. We also acknowledged the heterogeneous social, cultural, ecological, and economic contexts underlying the impact of urban domestic gardens for GI. Further, urban domestic gardens also act as a source of food security, by lowering personal food budget and providing an additional source of income through the sale of garden products, while offering additional ecosystem services.
Conclusion: The review concluded that home gardens and allotment gardens are important contributors to urban sustainability and should therefore be incorporated within the planning, design and management of urban infrastructures. This is particularly relevant to the current and future global climate warming.

Keywords: allotment, domestic, gardens, infrastructure, sustainability, urban

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AGRICULTURAL LAND USE IN ROMANIA AND LAND PRICES EVOLUTION

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Introduction: Agriculture is a multifunctional activity that contributes primarily to ensuring food security. In addition to this role, it has multiple functions, such as: environmental protection function, economic function and social function - by eradicating poverty, ensuring the well-being of the population and preserving cultural identity (Nowack et al., 2021). Romania is one of the European countries with the most favourable land base and climatic conditions for agriculture. However, the agricultural sector faces problems related to land fragmentation, farmers' reluctance to join associations and the phenomenon of land grabbing by foreigners.
Aims: In this context, the objective of this study is to highlight the dynamics of agricultural land use and land prices in Romania, especially at regional level.
Materials and Methods: The study was based on secondary statistical data provided by Eurostat and the National Institute of Statistics.
Results: Romania ranks fifth in terms of agricultural area, after countries such as France, Spain, Germany and Poland (Eurostat, 2021). At the level of Romania's development regions, the South-Muntenia region has the largest agricultural area, due to its geographical position in the Romanian Plain. According to data provided by Eurostat (2021), the price of agricultural land in Romania's development regions has increased in recent years (2014-2020). The lowest price of agricultural land is found in 2020 in the North-West development region (6261 euro/ha) and the highest in the Bucharest-Ilfov development region (11615 euro/ha).
Conclusion: Although the price level of agricultural land depends on several factors, regional aspects (geographical position and proximity to major cities) as well as increasing demand (including sale-purchase regulations) were decisive factors that led to the increase in the attractiveness and thus the price of agricultural land in Romania during the period under review.

Keywords: agricultural land, regions, Romania, prices

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EFFECT OF TOPPING ON GROWTH DEVELOPMENT AND CBD CONTENT OF HEMP (*CANNABIS SATIVA* L.) IN POT CULTURE

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Introduction: Hemp (*Cannabis sativa* L.) is a multi-purpose herbaceous crop and its importance derives from its ability to produce a variety of products with multiple applications, including textile fibers, food, construction materials, and medicines. In hemp cultivation, an important management factor is apical cut (topping) as this modulates plant architecture, plant biomass allocation as well as the yield of inflorescences and cannabinoids per plant and area.
Aims: This study aimed to evaluate the effect of topping treatment on agronomical and quality characteristics of two monoecious hemp varieties, 'Fedora 17' and 'Felina', in an indoor pot cultivation system.
Materials and Methods: A greenhouse pot experiment was conducted at the Agricultural University of Athens in spring 2019. The experiment followed a completely randomized design (CRD), with two topping treatments (untreated and topped).
Results: The results of this study revealed that plant height of both varieties was negatively affected by topping treatment and the higher values were recorded in the untreated (137.2 and 134.6 cm for Fedora 17 and Felina, respectively). The highest values of dry weight per plant and total inflorescences dry weight per plant were noticed for topped plants, especially in variety Felina. Finally, the topping treatment in hemp plants was beneficial by increasing the cannabidiol (CBD) content (1.25 and 1.28 for Fedora 17 and Felina, respectively.
Conclusion: The findings of the present study imply that the hemp had a positive response to applied topping for all studied cultivars. The CBD content was higher in topped plants as topping stress increased CBD content. In addition, further research is needed in order to investigate topping timing effects on inflorescence dry weight and secondary metabolism of hemp.

Keywords: Apical cut, *Cannabis sativa*, CBD content, greenhouse experiment

DEHYDROGENASE ACTIVITY IN SOILS: INFLUENCE OF COPPER, LEAD, CADMIUM AND VARYING SOIL TYPES

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Introduction: There is increasing interest in studies of enzyme activities in soils because they reflect soils‘ capacity to perform biological transformations important for soil fertility and agro-ecosystem services. One of the general criteria used to determine microbial activity and biomass in soil is dehydrogenase activity (DHA) (Trevors *et al*., 1982). DHA is an indicator for potential non-specific intracellular enzyme activity of the total microbial biomass. It has been also used as an indicator for active microbial biomass (Ladd, 1978).
Aims: Soils are caught in a crosssfire of different environmental influences notably heavy metals coming from traffic, plant protectants and other pollutants. They are able to react directly with soil exo-enzymes and influence soil fertility processes. Therefore, in a controlled pot experiment the influence of Cu, Pb, and Cd was tested with special attention of DHA in order to evaluate their inhibition potential.
Materials and Methods: A_h horizons of 5 different soil types were collected and incubated at 27°C for 8 weeks with increasing amounts of Cu and Pb (0, 50, 100, 200, 400 ppm), and Cd (0,75, 1,5, 3,0, 6,0 ppm). Sampling every week and determination of DHA.
Results: Untreated soils show a typical pattern for DHA during 8 weeks of incubation depending more or less on soil pH and soil C content. Cu reduces in all soils DHA already in the lowest dose of 50 ppm for about 25-50%. Similar observation can be for Pb which resuces DHS for approx. 40%. Cd has only a small influence on DHA-reduction which ranges between 1 to 10%.
Conclusion: In the present research work, we could demonstrate that especially the heavy metals Cu and Pb can reduce DHA drastically. Inputs coming from plant protectants and also organic soil amendments should be avoided. Strict analysis of such resources is necessary to reduce accumulation of Cu and Pb in agro-ecosystems.

Keywords: dehydrogenase, heavy metals, soils

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SALT AND UV-B STRESS EFECT ON BIOCHEMICAL PARAMETERS IN TOMATO LANDRACES FROM SALINE ZONES OF BIHOR COUNTY

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Introduction: A major constraint to global food production is the selection of crops that are better adapted to resource limited environments and soil conditions (Fiorani F., Schurr U., 2013). The genotypes grown under various environmental conditions will exhibit a phenotypic plasticity that is particularly big under extreme conditions such as frost, drought and salinity (Tester M., Langridge P., 2010). In the past decades the research in this field was focused on the study of the effect of the abiotic stress on the plants and on the elucidation of signalling pathways that governs the appropriate and coordinated response to abiotic stress.
Aims: The aim of study was to identify the salt and UV-B stress, and their combinbation effect on biochemical parameters (chlorophyll, carotenoids and proline) in tomato landraces from saline zones of North-Western Romania.
Materials and Methods: Two types of abiotic stress, salt and UV-B stress and it combination were applied on early stage of plant development in tomato landraces. For comparison, the same treatment was applied to a standard tomato cultivar. Chlorophyll a and b, carotenoids and proline were extracted from freshly harvested leaves, the content were measured spectrophotometrically.
Results:
Our results indicate that among the photosynthetic pigments, chlorophyll b is more sensitive to salt and UV-B stress. Between the landraces, in terms of the analysed pigments Cefa7 was shown to be more tolerant, and Ateas 37 more sensitive to applied stress. The concentration of proline increases gradually with increasing salinity; the highest is when UV-B stress is also applied in addition to saline stress.
Conclusion: Among the analysed landraces Cefa7 proved to be more tolerant to salt and UV-B stress, this landrace could be used for initiation of a breeding program. Proline content could be used as an indicator to UV-B and salt stress.

Keywords: drought stress, salt stress, tomato landraces, proline, chlorophyll

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THE INFLUENCE OF ADDITIONAL FERTILIZATION WITH ORGANIC FERTILIZERS ON TOMATO CROP PRODUCTION

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Introduction: Tomatoes represent one of the most valuable vegetables from a nutritional point of view, the qualities they possess have made them consumed in the most varied regions of the globe, even where they are not cultivated and the increase in tomato consumption is due to the fact as this vegetable has a very pleasant taste and an incredibly varied range of uses (fresh, in the form of tomato salad or mixed with other vegetables, soups, broth, pots, sauces, stuffed tomatoes, etc.).
Aims: It was analyzed how the productivity elements of the tomato crop in the field were influenced by the application of additional fertilization with organic fertilizers obtained only from natural ingredients.
Materials and Methods: The biological material was represented by the TAMARIS F1 hybrid, an early tomato hybrid, recommended for cultivation in greenhouses and solariums but also in the field, palisade. It presents a high resistance to diseases and pests and a tolerance to harsher conditions.Three organic fertilizers were used: Plantella Bio Organik is a long-lasting universal organic fertilizer, obtained from poultry compost and in the form of pellets, which improves soil fertility and increases its yield and contains: N-5%; P-3%; K-2%; CaO-9%; MgO-1% and trace elements: B, Cu, Fe, Mn, Mo, Z. The second fertilizer was Bio Plantella, in liquid form, with as the main component seaweed extract (Ascophyllum nodosum), added vitamins, hormones natural and a mix of nutrients, amino acids, carbohydrates and the third fertilizer used was the organic fertilizer Agrecol high quality granulated fertilizer, having the chemical composition nitrogen (N) - 6%, phosphorus (P2O5) - 5%, potassium (K2O) - 10% and magnesium (MgO) - 4%), ideal for soil preparation before sowing and planting. The experiment had 3 variants, each variant with 3 repetitions, placed randomly, in the control variant fertilization was done only with manure for the basic fertilization in a dose of 40 t/ha. Fertilizers were applied several times during the vegetation period, with an interval of 2 weeks between applications.
Results: From the analysis of the experimental variants it was found that the variant additionally fertilized with Plantella Bio had an average fruit weight between 170-180 g, with a production of 40 t/ha compared to the control variant where the average fruit weight was between 130- 140 g, and the production was 28 t/ha, it turns out that in the version fertilized with Plantella Bio, a 30% higher production was obtained compared to the control version.
Conclusion: From the organic fertilizer variants analyzed, the Plantella Bio liquid fertilizer stood out with the highest production of 40 t/ha, followed by the variant fertilized with Plantella solid fertilizers with a production of 36 t/ha and the variant fertilized with Agrecol fertilizer which production was 32 t/ha.

Keywords: productivity elements, organic fertilizers, tomatoes

THE EFFECTIVENESS OF PHYTOSANITARY TREATMENTS IN THE CONTROL OF OAK BREAD, IN THE CURRENT CLIMATE CONTEXT

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Introduction. In the technical process of afforestation of forest lands, most of the afforestation compositions require in the act of founding the new forest artificially produced seedlings.In some situations, obtaining them is a difficult process due to the complex of diseases and pests that can cause significant losses in forest nurseries, which are directly influenced by climatic factors.
Material and method. Climatic factors influencing the health of crops in nurseries are: air temperature, amount of precipitation, atmospheric humidity, potential evapotranspiration (Bouriard, 2014).The data were recorded with the help of the CEM DT 172 device, with the help of which data regarding temperature and humidity were recorded within the Beclen and Valea Iușului Nurseries.
Results. It was observed that the experiments related to the control of the pathogen *Microsphaera alphitoides (f.c.Oidium),* using *Proquinazid 200gr/l* were placed in three cultures, namely one one-year-olds and two two-year-old, the amount of solution being the same in each variant, differing. only the concentration and effectiveness was performed on four degrees of attack.
Conclusion. The variants were treated when the initial situation was very favorable and the application of the first treatments took place when the infection had not appeared. The situation was also positively reflected at the time of determining the effectiveness, when, with the exception of the control variant, in all the treated variants the vast majority of seedlings were weakly or moderately attacked.

Keywords: oaks, powdery mildew, temperature, humidity, treatment

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SESSION 5: ECONOMICS AND RURAL DEVELOPMENT

FOOD LOSS AND WASTE REDUCTION - A SUBSTANTIAL CONTRIBUTION TO FOOD SECURITY

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Introduction: The human population in the world is growing which increases the need for food. The utilised agricultural area is stagnating, followed by a moderate increase in yields. In such circumstances, other possibilities must be found to satisfy the nutritional needs of the world population. One of them is the reduction of losses and wastage of already produced food. Therefore, one of the Sustainable Development Goals (SDG 12.3) is to halve food waste and reduce food losses along production and supply chain by 2030.
Aims: The goal of the research is to indicate the extent of food losses and waste (FLW) and the stress importance of their reduction. In addition to determining the volume and structure of wasted food, the goal is to indicate the actions whose implementation would reduce the volume of FLW.
Materials and Methods: The research is a combination of the desk-research of secondary data sources and the interpretation of own research results published in scientific papers on the topic of household food waste in in Bosnia and Herzegovina, Serbia and Montenegro.
Results: FAO roughly estimates that FLW in the world is 30 percent. In underdeveloped countries, there losses of food are larger in the post-harvest stage, while in developed countries the focus of the problem shifts to food waste, i.e. retail sector and food consumption. There is a deficit of research on FLW in the Western Balkans. Research conducted on the topic of household food waste showed that waste is relatively small, as a result of lower family incomes. Households throw away bread and bakery products the most, followed by fruits and vegetables. During the COVID-19 pandemic, consumers became more responsible in terms of better food utilisation and partially reduced food waste.
Conclusion: Much more effort should be done to reduce FLW. The FLW reduction has the same effect on increasing food security as the more difficult achievable increase in food production. Some possible actions to reduce FLW are: better managing food production and consumption; improving the knowledge and skills of all participants in the food value chain; improving the equipment of farms, collectors and processors; raising consumer awareness of food waste, increase food donation, and improving the utilization of food waste for non-nutrition purposes.

Keywords: food loss, food waste, reduction

GOOD PRACTICES OF VERTICAL INTEGRATION IN AGRI-FOOD: AGROTRANSILVANIA CLUSTER

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Introduction: The development vision of the cluster is based on the general purpose and objective mentioned in the Statute and the Constitutional Act of the Association "Agro-Food-Ind Napoca Cluster", being to support the development of the agro-industrial sector, with the stated aim of supporting increasing the competitiveness of the association, as well as of each member, both on the market national as well as international.
Aims: Aware that the transition from a cost-based competition to an innovation-based competition is essential, the cluster and its members are focused on achieving this process in the long run. Besides the transition of enterprises / clusters towards innovation, it is also necessary to increase visibility as innovation-oriented structures and experimental research. The ones presented below can contribute to the development of innovative partnerships of regional and national impact and why not, internationally.
Materials and Methods: The AgroTransilvania Cluster initiative was born from the 20 founding members' wish to create a nonprofit, independent, non-governmental organisation, with public benefit, that would promote the development of the agro-industrial sector.
Results: The initiative gained a legal framework, with the help of the Agro-Food-Ind Napoca Cluster Association, on the 21st February 2013. The idea was solidified long before the Cluster itself was formed. Sectoral meetings, formal and informal alike, between future members were held, dedicated to discovering a common ground amongst future members and possible actions that can be taken in order to facilitate the formation of the Cluster. During time, It became an Integrator Pole of Research, Innovation, Technology Transfer and Sustainable Development of the Transylvanian agribusiness sector (supporting sustainable competitiveness of the agribusiness sector).
Conclusion: To conclude, the association desire to support the development of the agro-industrial sector, with the purpose of growing its, alongside of its members, competitivity on the national and international markets based on a shared development strategy. This can be achieved through involving the cluster's members in shared multi-disciplinary activities, such as research, development, innovation, technological transfer, providing services, production, visibility growth and so one, with the purpose of creating an innovative cluster.

Keywords: cluster association, value chain, integration.

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THE AREA OF TRANSYLVANIA-ROMANIA VINEYARDS AND WINE CELLARS FOR A SUSTAINABLE DEVELOPMENT OF RURAL BUSINESSES AND COMMUNITIES

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Introduction: Wine businesses as well as wine tourism, in the context of sustainable development of the Romanian village areas, have required multiple-level research to underline the complexity of strategies to be elaborated following the different facets of sustainability.
Aims: The purpose of this work is to establish if and how the wine businesses in Transylvania region of Romania can develop in a sustainable manner.
Materials and Methods: Our research is a combination between theoretical and office research and quantitative research instruments and methods, mostly by investigating the wine cellars' financial and accounting statements but also by the online presence of wine cellars, and the responses given by the entrepreneurs in this field to the applied questionnaires, respectively.
Results: For sustainable development, wine cellars should put emphasis on elements that also motivate them internationally, and the wine tourists who come and visit these destinations.
Conclusion: Additional services should be implemented by these superb economic entities, so as to combine the beauty, richness and landscapes of the vineyards with the flavour of the famous wines manufactured in and by these communities.

Keywords: wine, business, tourism, sustainable development

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THE EVOLUTION OF SMES IN ROMANIA AND THEIR EXPOSURE TO RISK

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Introduction: Risk management at the SME level is a topic that deserves further attention because at present SMEs doesn't put enough effort to identify, assess and monitor risks. The agricultural field is one of the most vulnerable because it depends a lot on climatic conditions that can be very changing.
Aims: It can be said that the risks in the field of agriculture are increasingly diverse. Because risk exposure in companies cannot be eliminated entirely the aim of this paper is to identify if small and medium-sized enterprises have introduced in the management process a risk exposure management plan and the methods they use.
Materials and Methods: The method used to assess how a risk management plan is implemented is the questionnaire. Through the questionnaire, data are collected on the measures applied by small and medium-sized enterprises to combat the effects of different types of risk. The questionnaire is applied to a sample of small and medium-sized enterprises in the rural area of Macroregion 1 in Romania, which includes the North-West and Centre (NUTS2) development regions.
Results: The behavior towards risk presents an optimistic trend because in most companies there is either a risk management measure in place or it is in the process of being implemented. Legislative, technological and competition changes cannot be anticipated, but changes in demand and availability of resources can be anticipated.
Conclusion: At present, risk management in SMEs due to inadequate human and financial resources is unconventional, quite intuitive, fragmented, pragmatic and often implemented in a reactive manner.

Keywords: rural SMEs, risk, risk management

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METHODOLOGY OF ESTIMATING THE BUILDING COMPETITIVENESS BY CLUSTERS CASE STUDY: SOUTH AFRICA

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Introduction: Based on prior research about the operating model when it comes to cooperation in South Africa the economic actors there have created cooperative relations in a naturally informal way. Moreover, relations are based on the complementarity of the fields in which they operate. However, it could be observed that this type of cooperation is not enough to form sustainable clusters /ecosystems.
Aims: The main purpose of this research is to deepen the knowledge about the cooperation model by carrying out a comparative analysis of clusters and clusters' politics from South Africa with developed and advanced countries in the treatment of these subjects from Western Europe.
Materials and Methods: The research was performed through an in-depth bibliographic study of national policies and legislation, official reports, and official statistical data on the number of clusters and the economic performance of the compared countries.
Results: To implement the European cluster economic model in South Africa, a much more customized approach is needed, not a generic one. This includes analyses on a wider scale, such as the degree of development of the compared countries where the model was implemented, the particularities and political priorities, the fields of activity. Going forward, the next steps that can be done are: mapping the existing clusters and their operating characteristics, assessing the regional business environments and the degree of competitiveness.
Conclusion: After carrying out the analysis, there is concern about whether this concept can be implemented in countries like South Africa. Further research will address other factors that influence the successful implementation of the model.

Keywords: cooperation, environment, impact

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RESEARCH ON THE PROTECTION OF AGRI-FOOD PRODUCTS IN ROMANIA

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Introduction: The terms "culinary nationalism" and "gastro-nationalism" have been used to describe how countries claim ownership over certain foods and provide them with institutionalised protection. In the context of the globalised food market, the European Union (EU) has created quality schemes as legal instruments for regulating ownership and control over certain food products.
Aims: The purpose of this qualitative case study is to identify the specific certification schemes to integrate Romanian traditional agri-food products. The main focus represents the process of applying for the EU quality labels and taking into consideration the position of the state institutions, the interpretation of traditional products by different national actors, and producers' intentions.
Materials and Methods: The materials for this research paper were provided from different sources such as: official reports; official statistical data about certification schemes in Romania; articles (literature review on the subject). The main sources of these materials were: the European Commission-more precisely the database eAmbrosia and, the Romanian Ministry of Agriculture and Rural Development. The most suitable research methods for this paper were the following: literature review/ bibliographical study combined with descriptive statistics in order to emphasise the number of products that are being registered towards Europe and the geographical distribution of these products. It was made a comparison between the actual state of registration in Romania and other European countries**.**
Results: At this point the target group does not have yet a legal identity is an ongoing process to establish the legal form of the association.
Conclusion: To conclude, I would like to point out that the aims of the certification schemes are to promote and protect the specific products of each country to every single European and non-European consumer. Certification schemes and Food security work hand in hand which brings us to the conclusion that certified products have a better quality and are more suitable to human consumption and friendly with the environment than the conventional ones.

Keywords: certification schemes, European regulations, food quality, national identity

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ASPECTS OF THE DEVELOPMENT OF RURAL TOURISM IN FĂGĂRAȘ LAND

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Introduction: The Land of Făgăraș represents a specific historical and ethno-folkloric region located in the central part of Romania, southern Transylvania, at the foot of the Făgăraș Mountains. From an administrative point of view, the region is located within the counties of Brașov and Sibiu.
Aims: The aim of this article consists of the analysis of the tourist potential of the region, the situation of the main tourist attractions and the opinion of tourists regarding them.
Materials and Methods: To achieve the objectives of this article, the method used was the analysis of the documents done in the past and who treated this subject. Document analysis is a fundamental source of social research in social sciences and, thus, in rural sociology. Also, a series of interviews were conducted with various tourists found in the area.
Results: In the absence of a large city that belongs to this area, the Land of Făgăraș is a destination more specific to the concept of rural tourism. More than 400 reception units operate in the region, and the tourist attractions specific to the place are, among others, those belonging to mountain tourism (the presence in the region of the highest mountains in Romania - the Făgăraș Mountains), cultural-religious-historical (Brâncoveanu Monastery from the climatic resort Sâmbăta de Sus, the fortress of Făgăraș or Cârța Cistercian Abbey), traditional Romanian villages or german fortified fortresses, Transfăgărășan, considered one of the most spectacular roads in the world etc.
Conclusion: In conclusion, it can be said that this region has a high tourist potential, being declared the tourist destination of 2020 in Romania. The region must be the subject of a more effective promotion campaign at the international level, the result of a unitary strategy of development.
Keywords: rural tourism, Făgăraș land, monography, village

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TRENDS OF ORGANIC FARMING IN THE EUROPEAN UNION

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Introduction: According to the "From Farm to Fork" Strategy, the European Commission has set “at least 25% of EU`s agricultural land under organic farming and significant increase in organic aquaculture by 2030” as key targets. In 2019, only 8.5% of the total EU utilized agriculture area was under the organic system.
Aims: The purpose of this paper is to assess the main ongoing trends of organic farming system in the European Union.
Materials and Methods: The data were collected from the official reports, official statistical data provided by EUROSTAT, European Commission, FADN, FiBL, IFOAM. The research methods used were the documentary analysis and the descriptive statistics to show the development of organic agriculture in EU.
Results: The number of organic holdings increased over the last years, in contrast to the declining trend in total number of conventional agricultural holdings. Organic farms are on average almost twice as large as conventional ones. The share of arable land in organic area accounted for 45.8% of the EU total organic agricultural area, while pastures and meadows covered 42.9% and permanent crops 11.3%. In 2019, there were almost 344,000 organic producers in the European Union. The 3 main categories of processed organic products are fruits, vegetables, cereals and milk.
Conclusion: Despite the strong increase in organic area (46%) observed between 2012 and 2019, trends were very different between the countries. Organic farming is considered as creating more added value and higher margins per production unit. Organic farming is recognized as a Common Agricultural Policy measure in the EU, supporting maintenance and conversion to organic farming.
Acknowledgement: The authors acknowledge the financial support of FoodLevers project provided by transnational funding bodies, partners of the H2020 ERA-NETs SUSFOOD2 and CORE Organic Cofund, under the Joint SUSFOOD2/CORE Organic Call 2019.

Keywords: EU, evolution, organic farming

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FINDINGS REGARDING CLUSTER MANAGEMENT EXCELLENCE FOR THE 4 GOLD CLUSTERS OF THE NORTHWEST REGION OF ROMANIA

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Introduction: In today's economy, clusters are a key driver of a country's competitiveness. However, the technological base of a cluster is now more than ever influenced by the actions of the constituent firms to transform themselves into distant sources of knowledge (Turkina, 2018). The concept of smart specialization provides structural changes in the activities of a region as a result of focusing on the uniqueness of an industry or types of economic activity. Thus, a long-term regional innovation policy is ensured (Kostygova, L et al, 2019).
Aims: The main purpose of the research is to identify the common points of cluster management quality for the 4 clusters of the North West region of Romania that are gold certified in comparison with the smart specialization strategy of the North West Region for the period 2021-2027.
Materials and Methods: As the materials used, research included Romanian clusters, analysis of European Union cluster policies, the study of tools that support the development of clusters, Gold audit reports for Transylvanian Furniture Cluster, Transylvania IT Cluster, AgroTransilvania Cluster and TREC Transylvania Energy Cluster. As research methods, analyzes were performed using the European Cluster Collaboration Platform (ECCP), European Secretariat for Cluster Analysis (ESCA) data and The smart specialization strategy for the North West Region in 2021-2027.
Results: Excellence in cluster management is the most basic tool for evaluating the performance of a cluster, as it encompasses all factors necessary for cluster sustainability (cluster maturity, cluster structure, typology, governance and cooperation, financing, strategy, objectives and services, but also achievements).
Conclusion: The four gold clusters took into account the recommendations of ESCA experts regarding the updating of development strategies, so that this process is carried out at least once every 2 years. The 4 cluster initiatives are well integrated in the cluster landscape in Romania, as well as in European activities. Internally, among the dedicated partnership, the triple helix is well represented.

Keywords: cluster, European Union, smart specialization

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ATTITUDES OF TOURISTS TOWARDS NATURE-BASED TOURISM: A SYSTEMATIC LITERATURE REVIEW

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Introduction: While tourism has developed into one of the fastest growing industries in the world (UNWTO, 2021), more and more consumers have raised interest into recreational experiences in pristine and wild environments (Elmahdy *et al*., 2017). Existing literature can provide great support to keep up with the increasing demand for nature-based tourism, understanding the trends, and providing opportunities for sustainable development in the field.
Aims: To lay out a general overview of the research literature focused on nature-based tourism, providing an insight to the studies aimed at understanding the consumers of nature-based experiences, their motivations, behaviour, perceived benefits and value.
Materials and Methods: The articles, proceeding papers and early access papers published in English between 2000 and 2021 and registered on the Clarivate Analytics' online database Web of Science have undergone a systematic review (PAGE et al., 2021). The obtained information has been presented in a concise manner and supported by relevant tables and graphs.
Results: Following the PRISMA guidelines, the research papers focusing on tourists that met the eligibility criteria were deeper analysed. The emphasize was on the type of methods and instruments used to assess the tourists' perception and attitudes, the main objectives of the identified research papers, as well as the funding status and potential applicability of the results obtained.
Conclusion: As no generally accepted definition of nature-based tourism emerges and the term covers numerous forms of tourism and various linked activities, analysing the literature and the scientific evolution in the field remains a challenge. With the increasing number of research papers in the last decade, the main directions of interest are the tourists' willingness to pay entrance fees, the visitors' perception and satisfaction and the congestion effects.

Keywords: nature-based tourism, protected areas, sustainable development

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E-AGRICULTURE IN ROMANIA. A COMPARATIVE ANALYSIS BETWEEN DIFFERENT DEVELOPMENT PATHWAY IN SELECTED MEMBER STATES

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Introduction: E-agriculture means the use of information and communication technologies (ICTs) in rural areas with a primary focus on primary production (FAO, 2017). Such an approach can improve, between others the livelihood of the rural communities while also supporting the environmental protection (Dey and Shekhawat, 2021). In the last two Common Agricultural Policies programming periods, the digital transformation of the rural areas was set as one of the top priorities (Ehlers et al., 2021). On the other hand, the last EU DESI report, placed Romania on the last place on different digital indicators like human capital; connectivity; digital technology in production or public digital services.
Aims: The aim of this paper is to analyze in a comparative approach what types of public policies were applied in Romania in the last two programming periods to support the digital transformation of the rural space.
Materials and Methods: The bibliographical study was conducted by analyzing the public websites of different policy makers from Romania, France, and the Netherlands.
Results: Results showed that countries with good DESI performances (France and Netherlands) started the digital transformation of their rural areas two CAP programming periods ago by promoting strong investments in the digital education and advice of their rural human capital. Also, the RDP priorities the farm investments based on the capacities of the new machineries to support precision farming. Strong digital connectivity and the support of the digital research were also other top priorities. Comparatively, Romania did not start yet the process of digital alphabetisation of the farmers. RDP did not take into consideration digital criteria for project selection.
Conclusion: There is the need for an E-agriculture national strategy to overcome the existing strong weaknesses.

Keywords: digitalisation, rural areas, public policies

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CONSUMER ACCEPTANCE OF A NEW BRAND OF TELEMEA CHEESE. A DESCRIPTIVE SENSORY ANALYSIS

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Introduction: The changes that the food industry is undergoing are driven by several factors, including more information available to consumers and increased food quality and food safety protection. Descriptive sensory analysis is important for the food producer since it reveals key information necessary to improve or maintain the product quality and it also helps understand consumers buying intention. This type of information may be further used for efficient marketing strategies that lead to the success of the product in the market.
Aims: The aim of this study was to understand consumer acceptance of a new brand of Telemea Cheese launched in Romania, according to the DLG 5-point scheme, as a descriptive sensory analysis method.
Materials and Methods: A descriptive sensory analysis, based on the DLG 5-point scheme, which included visual, olfactory and taste criteria. The DLG sensory analysis method is a "descriptive sensory test with integrated assessment", developed in agreement with the latest scientific findings and with development trends of the food market. The sensory evaluation was performed by a group of foreign students studying at University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca as consumers, who evaluated four varieties of sheep's milk cheese, named "Telemea", of which one product was a new brand.
Results: Using the DLG 5-point scheme method, the following aspects were analysed by consumers: appearance-exterior, appearance-interior, odour, taste, consistency. The analysis indicated that consumers highly appreciated the new brand and showed a high degree of acceptance compared to the other samples.
Conclusion: The results of the descriptive sensory analysis represent the starting point in developing marketing strategies in particular for producers of cheese, in close connection with consumers' perception. Developing marketing strategies that take into account consumer preferences is vital for a product to succeed on the market on a long term.

Keywords: consumers' expectations, food quality, sensory analysis

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EMPIRICAL RESEARCH OF THE DEGREE OF INNOVATION WITHIN EU'S LEADER PROGRAM

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Introduction: LEADER is a rural development method, based on participatory and bottom-up approaches, developed and employed by European Union (EU) to find innovative solutions for the local needs of the most vulnerable regions. The program, by involving communities in project development and decision-making processes, is designed to build on the local strengths and knowledge in order to transform the rural areas into incubators for innovation. However, in the 2007-2013 Programming Period stricter rules were applied for designing Local Development Strategies, thus limiting the degree of innovation that could be integrated.
Aims: The objective of the present work is to verify if the program stayed true to it's initial aims and to identify the most important factors that are encouraging or limiting the degree of innovation delivered by LEADER.
Materials and Methods: The results were obtained by reviewing the scientific literature on LEADER, using the systematic literature review, in order to understand how the method was implemented across EU, and by performing a content analysis on 31 Local Development Strategies from the North-West Development Region of Romania.
Results: The results show that LEADER plays an important role in promoting the development of rural regions, while implementing changes and encouraging cooperation ways that can be considered socially innovative. Local Action Groups (LAGs), responsible to implementing the method, manage to bring external knowledge and know-how from partners in other regions and countries into their territory. Thus, they facilitate the development of initiatives and projects that, otherwise, would have been marginalized and doomed to failure. However, the LAGs also face numerous limitations, such as rigid procedures, that forces them to select the easiest to implement measures, not the most innovative ones.
Conclusion: Despite some good results, a rethinking of the present model of implementation is required in order to maximize LEADER capacity to increase innovation and create more resilient rural areas.

Keywords: local action, innovation, participative approach, cooperation

THE EUROPEAN RURAL DEVELOPMENT VISION IN ROMANIAN CONTEXT – REVIEW ARTICLE

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Introduction: Rural areas need our implication more than ever, in Romania, we identify a large percentage of people leaving behind their homes. Without a strategy to support and create opportunities, we will lose the heartbeat of our economy and an important part of our identity. To come in help the rural areas The European Committee launched in December 2021 the Rural Pact. This pact is composed of all stakeholders who support the goals of stronger and connected rural areas. The intention of this research and of the Rural Pact is to encourage the social economy and entrepreneurship in rural areas. The European rural areas are home to 30% of the population and over 80% of the territory. Our role in this context is to develop a strong ecosystem that brings together different stockholders for a thriving community and an attractive place for innovators to live and work.
Aims: This paper aims to study ways to develop self-sustained communities and achieve economic potential by investing in our rural areas future through good policies.
Materials and Methods: The research consisted of understanding the areas of action proposed by the European Commission and how to improve the policies for achieving the long-term vision. The second step was debating the concept in an international focus group through a summer school where we discuss the Rural Pact, good practices in rural areas and challenges.
Results: The purpose of the Rural Pact is to develop all the rural areas of the European Union, based on the actions described in the pact, we can improve the policies in Romania, support the rural areas, create a safer space for villagers and at the same time to develop the agri-tourism. The focus group is a dynamic mix of youth from European countries such as Greece, Ireland, Croatia, Ireland, and Romania with different educational backgrounds who took the opportunity to study the High value and rural areas in their countries. They identify the needs of different stockholders from the villages and bring all the knowledge together. A great lack of trust in collaboration between farmers and the need for more practical policies was found, in addition to the need for education and a better understanding of how they can round their income
Conclusion: The present research paper revealed what the next actions will be and what are the weak points.

Keywords: agritourism, bottom-up method, rural policies, rural tourism, stockholders

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CONCEPT AND ANALYSIS OF INDIVIDUAL COMPONENTS OF THE FOOD SYSTEM

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Introduction: The food system has the task of meeting the nutritional needs of the population and includes, as key parts, the production, processing, distribution and consumption of food. Considering that the world's population will grow from today's seven to nine billion people by 2050, it is clear that the food system is under pressure.
Aims: The aim of the paper is to present and analyze the food system and especially the segment related to the production of the most important agricultural products, as well as their consumption, based on which it will be seen whether there are pressures that threaten the ability to meet the nutritional needs of the global population. The analysis covers the period from 2015 to 2020 and follows global food production trends with a special emphasis on the production of the most important groups of food products: cereals, meat, milk and eggs.
Materials and Methods: Primarily, data from the Food and Agriculture Organization were used, where relative indicators such as average growth rates and base indices were calculated.
Results: Average production of cereals in the world in the period 2015-2020. year, amounts to about 3 billion tons, while meat production is constantly increasing and is around 330 million tons. The decrease in the volume of agricultural production directly determines the increase in malnutrition. The food system is under great pressure to ensure that future generations meet their food needs as the world's population increases at a rapid rate.
Conclusion: One of the ways to improve the food system is to produce food in a sustainable way, to distribute it evenly and to consume it more responsibly, in order to reduce losses, current food waste and reduce malnutrition of the population all over the world.

Keywords: agricultural products, food system, global trends, population needs.

THE ENTREPRENEURIAL ENVIRONMENT IN CLUJ COUNTY. AN ANALYSIS BETWEEN RURAL AND URBAN

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Introduction: At the national level, the National Strategy for Research, Development, Innovation (SNCDI) 2014-2020 identifies as general objective is to increase the competitiveness of the Romanian economy through innovation, and the National Strategy of Competitiveness has identified a series of objectives regarding ensuring a sustainable economic balance and social, with a better participation and employment rate, the competitive development of agriculture and rural space, increasing social cohesion as a basis for competitive development, as well as rebalancing the functional relationship between the economy, nature and society through the efficient management of resource consumption, to ensure economic sustainability2018; Dan, 2017).
Aims: Taking into account the current trends and the need for a sustainable and resilient development of the rural areas (Harpa, 2016) we propose that through this study we will reach a better understanding of the economic differences between rural and urban areas in Cluj country.
Materials and Methods: The database of the National Institute of Statistics, Tempo Online and from Borg Design, ListaFirme were used for this research. The research method present and analyze the following indicators: GDP and GDP per capita evolution, the share of the number of companies according to size, number of companies by residence, contribution to the wage force, growth rate of the wage force.
Results: The small number of rural employers, but also the small diversity of the business environment, predominantly in the agricultural field and low wages, determine the migration of the labor force towards the urban areas or abroad, looking for a job.
Conclusion: At the level of Cluj country, Economic activity is much better represented in the urban environment, especially in big cities. However, there is an increase and diversification of economic activities in the rural environment, especially in areas with a medium to large population.

Keywords: entrepreneurship, rural development, Cluj county

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OPPORTUNITIES TO USE RENEWABLE ENERGY SOURCES FOR RESIDENTIAL CONSUMPTION OF ELECTRIC AND THERMAL ENERGY IN THE NORTH-WEST REGION OF ROMANIA

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Introduction: In recent years, the progressive decrease of natural resources, the worsening of pedoclimatic conditions and pollution phenomena, the demographic explosion, but also the recent conflict situation in Eastern Europe justify the search for solutions to reduce the dependence on imports of primary energy resources, to improve security of supply and combat climate change.
Aims: The article aims to investigate the perception of producers and potential domestic consumers on the use of renewable resources in the North-West Development Region, in order to identify the most important alternatives for the production and consumption of energy from renewable sources.
Materials and Methods: To carry out this study, a specific questionnaire was applied to a representative sample of 212 subjects, both from the urban and rural areas and a wide range of occupational fields, aged over 20 years, with various incomes and development opportunities. At the same time, only one member of a family was questioned, so the answers are the more representative at the level of active households.
Results: The most frequently selected solutions are those regarding the identification of consumption saving solutions, respectively the identification of alternative consumption solutions from renewable sources, which involve lower costs, proportional both to their needs and incomes they have. Also, the analysis highlights the population's awareness of the need to protect the environment (air, water, soil) and the natural resources we have.
Conclusion: On the one hand due to the liberalization of energy and natural gas prices in Romania, on the other hand due to the recent conflict in Eastern Europe, where the parties involved in the conflict are also the largest producers and suppliers of electricity and natural gas, it can be observed that the majority of the surveyed population is particularly concerned about household energy consumption and intends to apply for the implementation of alternative solutions from renewable energy sources, which are at the same time inexhaustible and non-polluting.

Keywords: renewable energies sources, circular economy, household consumers

DETERMINANTS OF HEALTHCARE EXPENDITURES EMPIRICAL EVIDENCE ON EU-27

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Introduction: Health care coverage comes with major implications in all fields. Worldwide healthcare expenditures dynamics have registered a continuously increasing trend. Curbing healthcare expenditures growth may be attained by identifying which factors determine them and their impact. These determinants range from economic factors to socio-demographic factors, various life style factors, and others.
Aims: The purpose of this study is to determine the main macro determinants of per capita health expenditures at a national level, for the European Union member states, estimating their size of impact.
Materials and Methods: Unbalanced panel data for the EU-27 member states throughout 2005-2020 are modelled with the pooled OLS method for panel data, fixed effects modelling and random effects modelling. Estimations are performed on the entire sample of European Union member states, further split into 14 old member states and 13 new member states.
Results: Per capita gross domestic product as a proxy for economic prosperity, life expectancy as a proxy for health outcomes and doctors' density as a proxy for the supply of European healthcare systems positively impact the healthcare expenditures of EU-27 member states. Mixed results are obtained for assessing the impact of subjectively assessed corruption, given by the Corruption Perception Index, upon healthcare expenditures, on the two subsamples of European Union member states.
Conclusion: Due to the continuous growth of health care expenditures, policymakers have to draw effective cost strategies in order to temper them.
Funding Source: This research is funded by a grant of the Romanian Ministry of Education and Research, CNCS—UEFISCDI, project number PN-III-P4-ID-PCE-2020-2174, titled "Intelligent analysis and prediction of the economic and financial crime in a cyber-dominated and interconnected business world".

Keywords: corruption, doctors' density, economic prosperity, healthcare expenditures, life expectancy

OPTIMIZING FARM'S PRODUCTION STRUCTURE BY USING THE LINEAR PROGRAMMING MODEL - AN EMPIRICAL APPROACH

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Introduction: The production structure of farms has a great importance in the context of Romania where there are many mixed farms and most of them have problems of economic viability. As shown in the literature (Csipkés, 2018) the optimization of the production structure is essential in ensuring the viability of farms.
Aims: Taking into account that the optimization of the production structure of Romanian farms is achieved only by simple methods that do not solve complex problems, it is our belief that the mathematical model of linear programming might be taken into consideration as a solution that can be easily applied. The choice of the economic indicator according to which the optimization of the production structure is carried out depends on the farm's objectives, complexity, and financial situation.
Materials and Methods: The model was applied to a case study to exemplify its usefulness at the farm level. The optimization was performed from different perspectives by using various economic indicators such as the standard output, gross margin, profit per hectare and production costs.
Results: The application of the method at farm level has revealed that the optimal structure differs depending on the farms' medium and long-term objectives. Gross margin was found to be the most suitable indicator depending on which the optimal production structure should be modeled.
Conclusion: The paper demonstrates that the use of gross margin as a base indicator for the mathematical modeling of a farm's production structure may be taken in consideration for ensuring its viability.

Keywords: gross margin, production structure, optimization

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SESSION 6: ANIMAL SCIENCE

ACHIEVING DESIRED POULTRY MEAT QUALITY AND TEXTURE THROUGH SOME CONTROLLED PERI-SLAUGHTER FACTORS

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Introduction: The biophysical and biochemical mechanisms underlying the maturation phenomena of poultry meat are not yet fully known, hence there are conflicting technological and experimental results on the effect of factors that interfere before, during and after slaughter. In-vivo muscle metabolism influences the biochemical dynamics post-slaughter (Listrat et al., 2016). White muscles (glycolytic), unlike the red ones (oxidative), will quicker reach rigidity and their ultimate quality, the degree of tenderness, will be also different (Wicks et al., 2022). Lower glycolytic potential of the muscles at slaughter will lead to DFD (Dry-Firm-Dark) meats, while too high potential will lead to PSE (Palle-Soft-Exudative) meats (Manalo and Gabriel, 2020).
Aims: Knowing that carcass cutting conditions and preserving way could influence the ultimate meat tenderness, the main aim was to investigate if myocytes thickness, connective/pure muscle tissue ratio, shear force were affected, as main descriptors of meat texture.
Materials and methods: *Pectoralis superficialis* and *Quadriceps femoris* muscles have been sampled from 42 days old broilers, electrically stunned, vapor chilled and submitted to carcass cutting temperatures between 2-4C° and 6-8C°. Experimental refrigeration or freezing were used as preservation methods. Part of the samples from each treatment included in paraffin, HEA stained then microcitohistometrically assessed, while the other part was submitted to shear force analysis via Perten TVT 6700 texture analyzer. Correlation and analysis of variance were run using GraphPadPrism 9 software, to establish the differences between different kind of treatments.
Results: Lower temperature during carcass cutting induced higher shear force values compared to higher temperatures ($P < 0.05$), while freezing resulted in lower shear force, compared to refrigeration and to loss of histological structure due to myocytes membrane breaking ($P < 0.01$).
Conclusion: Refrigeration, correlated with lower temperature on carcass cut provided firmer texture on poultry meat, while freezing along with slightly higher temperatures provided more tender meat but with textural integrity alteration. White meat (breast) was firmer than red meat (thigh muscles) in all experimental conditions.
Keywords: Poultry meat, metabolism, rigor mortis, maturation, texture.

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MULTIFUNCTIONALITY AND SUSTAINABILITY OF ALFALFA (*MEDICAGO SATIVA* L.) CULTIVATION: A REVIEW

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Introduction: The main objective of the current intensive agriculture system is to obtain high yields with strong and often extreme land exploitation. Among its main benefits are sufficient food supplies at affordable prices. However, this food system is unsustainable (Woodhouse, 2010), leading to environmental and social problems.
Aims: In this context, we aim to promote perennial crops and nitrogen-fixing legumes like alfalfa as a sustainable solution to a variety of these problems.
Materials and Methods: Literature searches were conducted through the search engines of Web of Science, ScienceDirect, Google Scholar and ResearchGATE in order to collect data regarding alfalfa's importance and its functionality for the society and the environment.
Results: Since its introduction in the late 1970s, the concept of sustainable development suggests that sustainability and development are intrinsically connected to each other (Randrup *et al*., 2020) by the need to address economic and environmental concerns. When agricultural activity is supported by good environmental conditions, this enables farmers to use natural resources, create their products and earn a living. Also, the income generated by sustainable agriculture supports farming families and rural communities, while the food supports society as a whole. Currently, alfalfa is a central source of feed for livestock grown commercially in many countries around the world and has potential to provide a sustainable solution for food and protein security (Viti *et al*., 2021).
Conclusion: Following nature's model, as sufficiency is far more materially generous than what is often assumed, such a transformation would mean reducing consumption to levels of sufficiency. This review shows alfalfa's potential in improving our food systems.

Keywords: Alfalfa, environment, sustainability.

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ASSESSING THE WELFARE OF DAIRY COWS IN TERMS OF HOUSING CONDITIONS

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Introduction: Many of the world's dairy cows are raised in the tiestalls system (Annabelle Beaver, et al, 2020). According to Hulsen J. [2008], all the activities that a cow carries out during the entire duration of a day are translated as follows: 6 – 14 – 2 – 2, but the maintenance of the tiestalls system has its disadvantages, which affect their degree of well-being from the prism of the 5 freedoms (El Mahdy, 2018)
Aims: The aim of the research was to evaluate the welfare conditions of the dairy cows from the point of view of the housing conditions with reference to the degree of comfort, the quality of the rest bed depending on the size, the floor: wood, concrete, grill and bedding: rubber carpet, straw correlated with the body hygiene score, the number of somatic cells, from the perspective of NCS/ml, the care of the farmers towards the animals, and the knowledge they have regarding maintaining an increased degree of animal welfare, in small holdings, in the area of the county Harghita: Sărmaș (3 farms), Subcetate (1 farm), Lăzarea (1 farm), Joseni (3 farms), totaling 160 cows (7-35 heads/farm).
Materials and Methods: The study was carried out on the basis of a questionnaire that includes a number of 20 questions, each question being assigned a maximum number of 5 points, the final result by cumulating the points indicating the degree of comfort of the cows in terms of: housing and the facilities they benefit from a number of 8 respondents participated, who own milk cows, in addition, linear measurements were carried out, direct observations on the animals and documents provided by the farmer, and statistical analysis using SPSS program.
Results and discussions: From the centralization of the marks given to each question, the final score obtained places the farms in mediocre housing conditions (60-76). The lowest marks were given exactly to the criteria that most influence the well-being of the cows, namely, the resting stall, the bedding, the microclimate conditions in terms of temperature.
Conclusion: Based on the results of the evaluations, there are no significant differences related to the body hygiene score between the different types of flooring and bedding, however, the balance leans towards the maintenance of cows where the flooring is of the grate type covered with rubber carpet.

Keywords: Bedding, body hygiene score, dairy cows, floor, NCS welfare.

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GENETIC STRUCTURE AND MOLECULAR DIVERSITY OF LASIOCAMPIDAE (LEPIDOPTERA) IN ROMANIA, BASED ON MITOCHONDRIAL COI GENE SEQUENCES

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Introduction: The DNA Barcoding method is widely used for the determination and classification of different taxonomic groups. In the case of Lepidoptera, the method works for 95% of the species (Hebert et al., 2009; Dincă et al., 2015). Romania is the first country in which the complete genetic inventory for butterflies was realized through CO1 (Dincă et al., 2010). As far as moths are concerned, Romania remains a white spot on the CO1 map of Lepidoptera in Europe. One of the moth families for which there is no data is the Lasiocampidae.

Aims: The present study is to bring new, current data regarding the genetic structure and molecular diversity of Lasiocampidae species from Romania. The study represents fundamental research that contributes to filling the gaps on the genetic map of Lepidoptera in Europe, by completing the BOLD and NCBI international databases with sequences for Lasiocampidae species from Romania.

Materials and Methods: 102 specimens of moths from 20 species of Lasiocampidae from Romania were used for the study. DNA extraction, DNA amplification (PCR), sequencing, sequence processing (obtaining DNA Barcoding), uploading results to BOLD were performed at the Canadian Center for DNA Barcoding (http://ccdb.ca/).

Results: Following the study, we obtained the genetic inventory of the Lasiocampids of Romania. Our study is the first of its kind carried out on an entire family of moths in Romania and is the first study with national coverage for the Lasiocampidae family in Europe. After sequencing, we obtained 98 sequences with a length of 658 bp (base pairs). For the species *Eriogaster rimicola* and *Lasiocampa eversmanni* we obtained the first sequences in the world. *Poecilocampa alpina* (Frey & Wullschlegel, 1874) is reported for the first time in Romania's fauna.

Conclusion: The 98 sequences obtained provide information regarding the genetic structure for all 20 species of Lasiocampidae present in the Romanian fauna. After the study conducted by Vlad Dincă (2010), when Romania was the first country with the complete genetic inventory for butterflies, today we have completed the inventory for the Lasiocampidae Family.

Keywords: *CO1,* DNA barcoding, *Lasiocampidae, Lepidoptera*, România.

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EFFECTS OF PEN SHAPE ON PIG PERFORMANCE AND WELFARE

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Introduction: Growth and finishing performances in pig farms are crucial for profitability in today pork industry while space allowance per pig remains one of the main considered welfare marker (Thomas *et al.*, 2017, Deen J, 2005).
Aims: The aim of the experiment was to assess the impact of housing nursery and finishing pigs in two differently shaped pens, with the same space allowance per pig. Growing and finishing performances were recorded in order to evaluate whether the pen shape and design has any influence on growth traits and pigs welfare.
Materials and Methods: In total 178 pigs were included in the experiment, with growth performances recorded at the time of transfer into nursery, to finishing and to slaughter where carcass traits and skin lesion evaluation was performed. In nursery 0.3 m^2 / piglet was allocated while finishing pigs had a space allowance of 1.1m^2/pig. Both age groups were distributed into two pen shapes. In shape A pens the length to width ratio was 1.5:1, while in shape B pens the ratio was 2.4:1.
Results: At the end of nursery stage piglets reared in shape A pen were 3.1 kg heavier in average than those in shape B pen, under similar rearing conditions. Recorded finishing growth performances are suggesting that pigs housed in shape A had a higher growth rate (plus 46 g/ day) than the ones raised in shape B pens. However, differences were not significant when feed intake was considered. Rearing of pigs in different pen shapes does not seems to impact significantly the carcass traits.
Conclusion: The results seems to suggest that the pen shape design has influence on the rearing performances even if other conditions are the same. Therefore, it would be desirable that building new farming facilities should consider the pen length to width ratios for enhanced performance and welfare.

Keywords: Growth efficiency, pen design, pigs, welfare.

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TOWARDS A SERVICE-LEARNING MINDSET IN STUDENTS IN ETHOLOGY & HUMAN-ANIMAL INTERACTION

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Introduction: Service-Learning (SL) is considered a form of innovative pedagogy, that combines learning with service in the community, fostering a compassion-based civic involvement of students through meaningful learning and reflection (e.g. Bringle & Hatcher, 1996). The study presents a qualitative thematic analysis of SL project proposals of the first generation of students of the Ethology and Human-Animal Interactions master's program (EHAI), Faculty of Animal Science and Biotechnology, USAMV CN.
Aims: The aim of this study is to investigate whether the SL proposals elaborated by the EHAI students indicate an understanding of the transformative power of reflection and whether they include elements reflecting the Sustainable Development Goals (SDGs) approach.
Materials and Methods: A number of 10 students submitted their SL proposals in a template provided by the teacher, at the end of one-semester SL course. A thematic content analysis was performed on the proposals, using a standard qualitative method (Erlingson and Brysiewicz, 2017).
Results: The topics of the SL proposals covered mainly the area of HAI, i.e. stray dogs and cats, interactions of stray animals with local fauna, but also undesirable behaviors toward horses. The following SDGs emerged as themes: quality education, good health and well-being, sustainable cities and communities, life on land, and peace, justice and strong institutions.
Conclusion: The findings of this qualitative analysis are promising in terms of empowering the EHAI students with a SL mindset, in line with the expectations of the community representatives regarding the roles of the EHAI graduates as agents of change and humane educators (Rusu, Criste & Dezmirean, 2021).

Keywords: Service-learning, human-animal interactions, higher education.

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SESSION 7: BIOTECHNOLOGY

MICROALGAE AS HUMAN FOOD AND ANIMAL FEED: CHALLENGES AND PERSPECTIVES

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Introduction: In Egypt, a frightful mass of filter mud as byproducts was obtained from the clarification of cane juice in sugar industries. Beet filter cake extract (BFCE) has been used as a bio-fertilizer, and it had a positive effect on plant growth and soil biochemical and physical properties. Moreover, it contains plant growth regulators, auxins, enzymes, vitamins, and hormones (Solaimalai et al. 2001). As a result, this solid waste can be used for the production of cyanobacteria genus *Spirulina* which contains about 60 to 70% of proteins, nucleic acids, and amino acids recommended by the FAO as food and feed (Pelizer et al., 2003).
Aims: This study aims to grow *Spirulina* alga on beetroot industry wastes as an alternative.
Materials and Methods: Axenic Spirulina culture was cultivated in sterilized Zarrouk's liquid medium (Zarrouk 1966). The BFCE-supplemented cultures were prepared by adding different concentrations to the nutrient culture media, and the control medium contained only default Zarrouk's medium without any additional nutrients. Samples were taken out daily to measure the optical density at OD 680nm and photosynthetic activity using PAM fluorometer. In contrast, dry weight (Vonshak 1997), chlorophyll a, b, carotenoids (Jeffrey and Humphrey 1975), protein content (Lowry et al. 1951), total carbohydrates (Dubois et al. 1956), and lipid (Byreddy Gupta et al. 2016) were measured just at the end of the experiment.
Results: Fv/fm values of all treatments were in acceptable ranges showing a decrease of treatments 75 % and 100%. The highest dry weight of *Spirulina* in 0% was followed by 75% concentration, with the least dry biomass at 50% concentration. Also, The concentration of chlorophyll b in control and 50% waste was almost similar. In 100% waste, there was a decrease in all pigments. The highest concentration of protein was (50.98±8.9) in Zarrouk media, followed by 25% waste (46.56± 1.4) and 50% waste (39.11±0.36). Lipid content in control and BFCE was in 25% (8.14±0.26).
Conclusion: In the present research work, *Spirulina* alga can grow on alternative wastes as a cheaper production process to produce single-cell protein as food and fodder.

Keywords: *Spirulina*, protein, food, feed, microalgae.

PEPTIDE APPLICATIONS IN BIOTECHNOLOGY AND BIOMEDICINE

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Introduction: Cancer, neurological disorders, and viral infections, among others, must be treated due to the modern lifestyle and increased life expectancy of the human population. (Copolovici et al., 2014; Copolovici and Lupitu, 2018). Consequently, there is a need for novel, effective, and dependable techniques with increased specificity for target cells, low cost, and minimum adverse effects on healthy tissues. Peptide-based systems are one of the potential medication and gene delivery strategies. Peptides are tiny molecules readily available, chemically modifiable, stable under a wide range of biological conditions, capable of traversing the plasma membranes of cells and delivering cargo (drugs, nucleic acids, imaging agents, etc.) into the cytosol or nucleus, and typically non-immunogenic.
Aims: Peptides having antimicrobial capabilities, known as antimicrobial peptides (AMPs), function as efficient delivery vectors of bioactive compounds, including medications, in various applications, including cancer, genetic disorders, cardiovascular, infectious, and inflammatory illnesses. Initially, AMPs were extracted from natural sources (human milk – lactoferrin (hLF), porcine leukocytes – protegrin-1 (PG-1), stomach tissue of Asian toad – buforin II, etc.), and several newly developed and synthesized peptides will be discussed.
Conclusion: To accelerate the development of peptide-based drug delivery systems, it is necessary to design peptides capable of penetrating the cell membrane or crossing biological barriers, delivering cargos specifically into targeted cells, possessing increased circulation times, and being non-toxic and non-immunogenic, among other characteristics.

Keywords: Antimicrobial peptides, cancer, drug delivery systems, human diseases, biotechnology.

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USING HONEY ENHANCED ARTIFICIAL DIET TO IMPROVE *BOMBYX MORI*'S FEATURES

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Introduction: Nowadays, the silkworm (*Bombyx mori*) gained a lot of attention from the scientific community due to its applicability in various life science fields. Keeping this in mind it is of great interest to combat the seasonal limiting problem when it comes to the exclusive silkworms nourishing source, namely the mulberry leaves. There are numerous artificial diets available for rearing silkworms in order to overcome the mulberry seasonal restrictions.
Aims: Herein, aiming to enhance certain biological and economic traits of *B. mori*, we included linden honey in the artificial diet acknowledging honey's complex composition.
Materials and Methods: The experiments were carried out in the Sericulture Department and the Global Center of Excellence and Advanced Research in Sericulture and Promotion of Silk Production. We analysed the impact of two concentrations of linden honey, 2% and 5%, respectively on several biological and economic traits. After feeding the silkworms with enhanced artificial diet, we measured the weigh and the length of the larvae, but we also determined the weight of the silk glands. Moreover, certain economic traits were analysed after supplying the artificial diet with honey.
Results: Our results showed that by adding 2% of linden honey in the artificial diet all studied parameters, for instance the larval length and weight or the number of deposited eggs, were lower than in the control group. On the other hand, by supplementing the artificial diet with 5% linden honey all parameters not only were enhanced in comparison with the group that received 2% honey, but all traits were increased compared with the control group.
Conclusion: Honey exhibits great importance not only for the human health or for the food industry, but it is also a key player for the sericulture. It is of significant interest to enhance the traits of *B. mori* for the economy, but also for the medical area.

Keywords: Artificial diet, economic traits, honey, silkworms.

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AIMING TO APPLY CERTAIN MICROPROPAGATION TEHIQUES IN THE GLOBAL CENTER OF EXCELLENCE FOR ADVANCED RESEARCH IN SERICULTURE AND PROMOTION OF SILK PRODUCTION (GCEARS-PSP)

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Introduction: Mulberry (*Morus* spp) is a perennial tree plant, very long-lived and with a high economic value. It grows in temperate climates, both spontaneously and in crops. The most common varieties are white mulberry (Morus alba), red mulberry (Morus rubra) and black mulberry (Morus nigra). It is of major importance in the silk industry, as well as recent studies have shown the use of mulberry in obtaining functional foods and pharmaceutical supplements, which is why its cultivation would have high economic benefits.
Aims: The aim of this paper was to identify alternative methods of multiplying biological material, in order to increase the production of qualitative mulberry leaves and fruits. All research is conducted as part of the activity of the Global Centre of Excellence for Advanced Research and Promotion of Silk Production of Cluj-Napoca (CGECAS-PPM), which aims to invigorate the sericulture and moriculture in Romania.
Materials and Methods: In order to achieve this goal, our currently ongoing project so called DUDFOOD comes as a lever for the CGECAS-PPM in terms of specific objectives we are now working on: obtaining new fodder recipes based mulberry leaves, establishing and reviving of mulberry nurseries and plantations (testing of micropropagation techniques; testing of alternative systems for the production of dendrological material by: aquaponics, hydroponics, aeroponic and conventional for Kokuso 21 variety) as well as developing a dietary supplement. As a start, a conventional culture has been initiated and maintained in the greenhouse conditions. The development of the seedlings has been accelerated by exposing them to purple LED Grow Light.
Results: As for alternative methods, the most common method shown in the literature was micropropagation, using MS as culture medium and different combinations of growth regulators, depending on the desired results. We managed to initiate the organogenesis and callus formation starting from buds as explants, in the micropropagation laboratory from The Biodiversity Research Centre, UASVM Cluj-Napoca. However, growing in systems such as hydroponics, aeroponics or aquaponics could represent a solution when there is no land available for conventional cultivation or enough water to ensure the daily need for plant growth.
Conclusion: The exploitation potential of mulberry is extremely high, due to the prospects of using alternative techniques of multiplication of biological material (micropropagation, ponic systems) to obtain leaf production throughout the year that could be used in sericultural practice, food, or pharmaceutical industry.
Keywords: Aquaponic, DUDFOOD, micropropagation, mulberry.

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PRIMARY CHARACTERIZATION OF THE NANNOCHLOROPSIS SPECIES GROWN UNDER CONTROLLED CONDITIONS

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Introduction: *Nannochloropsis* sp. microalgae is one of the most industrially significant species due to its photosynthetic efficiency and lipid productivity (Giovanna Salbitani et al., 2021). In the past, microalgae have been used as source for biofuel production (Christine Rösch et al., 2018), but nowadays studies showed that is suitable for nutraceuticals such as omega-3 fatty acids, carotenoids, and protein. *Nannochloropsis* sp. contains high amounts of omega-3 fatty acids in the form of eicosapentaenoic acid that has been proposed as a suitable alternative for fish oil.

Aims: The research is part of a bigger AlgaeBrew project and represents the first research steps to characterize the *Nannochloropsis* biomass with the aim of knowing its content in order to apply green extraction methods to obtain a high yield of lipid fractions, respectively polyunsaturated fatty acids.

Materials and Methods: *Nannochloropsis* sp. culture was grown at the 1000L PBR under F/2 media in the green house, Swansea UK. The obtained biomass was freeze-dried in industrial freeze dryer and provided from one of the partners involved in the project (UK). For its characterization, the following analysis methods were applied: fiber content, inorganic elemental analysis using inductively coupled plasma mass spectrometry (ICP-MS) and organic elemental analysis using CHNS analyser.

Results: Following the organic elemental analysis, results were obtained: C content 57.222%, N content 7.994%. The results were calculated based on a calibration curve using cystine. The cellulose content was 87% using the acid detergent lignin (ADL) method.

Following the inorganic elemental analysis, both the major elements (Na, K, P, Ca, Mg) and the minor elements (Cr, Se, Mn, etc.) were quantified.

Conclusion: In this paper, we have identified the primary composition of the *Nannochloropsis* biomass that will help us in the continuation of our research regarding the choice of suitable methods for cell disruption for omega-3 extraction.

Keywords: Elemental analysis, feed and food, microalgae, omega-3 extraction .

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THE POTENTIAL USE OF *L. PLANTARUM* AND *L. ACIDOPHILUS* FOR SOLID STATE FERMENTATION OF BEE POLLEN

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Introduction: Bee pollen represents an important source of carbohydrates, protein, and lipids. All these make it the ideal medium to be used as a substrate for fermentation being considered by some authors even prebiotic (Borges et al., 2021; Nowak et al., 2021).
Aims: The aim of this study was to use probiotic fermentation of bee pollen in order to obtain a product with high nutritional properties and with beneficial bacteria for bees' gut microbiota. Lactic acid bacteria: *L. plantarum* and *L. acidophilus* were used for the fermentation process.
Materials and Methods: Spectrophotometric method were used for determination of total polyphenols, flavonoids, antioxidant and antimicrobial activity.
Results: Obtained results showed that there are significant differences between the chemical composition of the bee pollen samples before and after the fermentation process and that this process increase the value of bioactive compounds. The total amount of polyphenols before fermentation was between 4.35-15.47 mg GAE/g sample and after fermentation it varied between 6.14-18.21 mg GAE/g sample. Also, the fermentation process had a positive effect on the quantity of flavonoids from the samples. Samples of fermented pollen had a higher antimicrobial effect against the tested bacterial strains.
Conclusion: Probiotic fermentation seems to increase the nutritional and biological value of bee pollen, but further research is needed to evaluate the bioavailability of the probiotic bacteria from the obtained product and its beneficial impact.

Keywords: Bee pollen, fermentation, lactic acid bacteria.

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GREEN SYNTHESIS OF SILVER NANOPARTICLES USING BACTERIAL METABOLITES: CHARACTERIZATION AND ANTIMICROBIAL EFFECT

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Introduction: Microorganisms resistant to antibiotics have become difficult to treat with current antibiotics. Silver nanoparticles are among the most promising nanomaterials that have antibacterial properties. Also silver nanoparticles have remarkable biochemical reactivity compared to larger particles that have the same chemical composition (Rafique et al., 2019).
Aims: The present study aims to develop silver-based nanoparticles, using a green synthesis method, easy to apply, mediated by bacterial metabolites of *E. coli, L. plantarum* and *S. aureus*, and test their effectiveness against various pathogenic and antibiotic-resistant bacterial strains.
Materials and Methods: Diffusion method, but also by the microdilution method, using spectrophotometric techniques for reading the samples absorbance. The content of polyphenols was determined by the spectrophotometric method and HPLC.
Results: The supernatants of the bacterial cultures used for the synthesis were rich in polyphenols and flavonoids, especially kaempferol. The antimicrobial activity of the synthesized silver nanoparticles was tested on Gram-positive and Gram-negative strains. The efficacy of silver nanoparticles was more prominent against Gram-negative compared to Gram-positive bacteria, this is due to structural differences of the bacterial cell wall. *E. coli* and *Ps*. *aeruginosa* presented the largest diameter of inhibition, being the most sensitive to the synthesized nanoparticles.
Conclusion: The results confirmed that the supernatants of bacterial culture *E. coli, L. plantarum* and *S. aureus* are capable of synthesizing silver nanoparticles and these nanoparticles showed good antimicrobial activity, but tested Gram-negative bacteria showed increased sensitivity to silver nanoparticles.

Keywords: Bacteria, synthesis, silver nanoparticles.

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SESSION 8: VETERINARY MEDICINE - FUNDAMENTAL AND PRECLINICAL SCIENCES

PRELIMINARY RESULTS ON THE ANCESTRALITY OF CURRENT VARIETIES OF THE IBERIAN PIG

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Introduction: In Spain, one of the most important autochthonous breeds for its traditional impact on the Mediterranean diet, on the economy and above all on the environment, is the Iberian pig breed. In a project that our Research Group is carrying out in collaboration with the Heritage Resources Research Group, both from the University of Cordoba, on the analysis of ancient DNA, we are trying to find out the origin of the Iberian pig breed and its varieties, a breed that, as we have pointed out above, is fundamental in the maintenance of our Mediterranean forest.
Aims: To analyze the origin of the Iberian pig breed**.**
Materials and Methods: A total of 22 old DNA samples were used, corresponding to 8 periods and 9 archaeological sites. In addition, 12 of the modern DNA samples were used, including those from the wild boar as the closest wild ancestor to the domestic pig. On the other hand, samples of the Iberian pig breed were used, which come from a single trunk within the Mediterranean breeds and historically distributed throughout the geography of the Iberian Peninsula. All samples were genotyped with Illumina® SNP60 chip, which allows the detection of up to 62331 SNP (Single Nucleotide Polymorphism) molecular markers distributed among all chromosomes.
Results: The results of the retained genetic variability values (% of heterozygotes versus total SNPs obtained) show how old DNA samples always show higher levels (0.560) than modern samples (0.310). The coefficients of genetic differentiation between analysed populations (Fst) indicate that old DNA and modern DNA show a very high level of differentiation (0.408), much higher than that of modern samples (maximum of 0.138 among varieties or maximum of 0.252 between Iberian group, Retinto y Negro Lampiño, and Wild Boar).
Conclusion: In our study we found that the small variation among Iberian pig varieties is consistent with the fact that today they are included within the same breed. The closeness of the wild boar to the different Iberian pig varieties, as well as to old DNA samples, could corroborate the hypothesis that the peninsula has been a point of domestication from the indigenous wild boar, and the fact that the Iberian pig breed is considered one of the oldest domestic breeds in the world. The tree of genetic distances shows how the old DNA samples are grouped in a clade very different from the rest of modern samples. Two varieties have special characteristics. One, the Negro de los Pedroches variety, is separated from the rest of the Iberian varieties while the blond lineage (Dorado Gaditano) is found in two clades possibly due to their different genetic structure.

Keywords: Ancestrality, Iberian pig, old DNA, wild boar

CHEMICAL PROFILE, ANTIOXIDANT AND ANTIMICROBIAL ACTIVITIES OF *CORNUS MAS* AND *SORBUS AUCUPARIA* FRUIT EXTRACTS

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Introduction: *Cornus mas* and *Sorbus aucuparia* are medicinal plants that belong to the *Cornaceae* family and *Rosaceae* family respectively. They are cultivated especially for food consumption and as ornamental plants. *Cornus mas* is known to be rich in phenolic compounds, vitamins and organic acids. On the other hand, *Sorbus aucuparia* has recently been described as an important source of various bioactive constituents. Different parts of the plants are used in traditional medicine for the treatment of various diseases.
Aims: The aim of this study is to establish the chemical profile and to investigate the antioxidant and antimicrobial activities of *Cornus mas* and *Sorbus aucuparia* fruit extracts.
Matherials and Methods: From both fruits, ethanolic extracts were obtained. Because studies indicated that *Sorbus aucuparia* is rich in lipophilic compounds from class of carotenoids, carotenoid extract of this fruit was also obtained. The chemical profile of the ethanolic extracts was assessed using chromatographic (HPLC-DAD-ESI+) and spectral (UV-Vis) methods. Among the spectral methods, Folin-Ciocalteu was used to determinate total phenols, Plant Flavonoids Colorimetric Assay Kit was used to determinate total flavonoid content and an UV spectrophotometric assay was used to determinate total carotenoids. The antioxidant capacity of ethanolic extract of *Cornus mas* and carotenoid extract of *Sorbus aucuparia* was assessed using DHPP and FRAP Assay. The antimicrobial activity of both fruit extracts was assessed using agar well-diffusion assay.
Results: Total polyphenols content ranged from 0.472 to 0.847 mg GAE/mL for *Cornus mas* and from 1.003 to 1.408 mg GAE/mL for *Sorbus aucuparia*. Total flavonoid content ranged from 139.14 to 236.47 µg/mL for *Cornus mas* and from 106.64 to 537.58 µg/mL for *Sorbus aucuparia*. Total carotenoids content was higher for *Sorbus aucuparia* (19.5 µg/g) than *Cornus mas* (3.8 µg/g). There was a huge variation between DHPP and FRAP method, obtaining IC50 = 0.466 mg/mL and 23.09 µmol Trolox/mL for *Cornus mas* and IC50 = 24.51 mg/mL and 0.016 µmol Trolox/mL for *Sorbus aucuparia*. As for antimicrobial activity, the ethanolic extract of *Cornus mas* showed antibacterial activity against most of the reference bacterial strains, except *Pseudomonas aeruginosa*. In contrast, carotenoid extract of *Sorbus aucuparia* did not show any antimicrobial activity on the selected strains.
Conclusions: To sum up, it is clearly seen that *Cornus mas* and *Sorbus aucuparia* have significant potential as sources of bioactive compounds in modern medicine, but additional studies are needed regarding the antioxidant and antimicrobial effect.
Keywords: antimicrobial, antioxidant, chemical profile, *Cornus mas*, *Sorbus aucuparia*
Acknowledgments: This research was funded by National Research Development Projects to finance excellence (PFE)-14 (ID 546) granted by the Romanian Ministry of Research, Innovation and Digitalization. This research was funded by USAMV CN project 24905/08.11.2021.

EXPERIMENTING METHODS OF ISOLATION OF GERMS FROM THE *CLOSTRIDIUM DIFFICILE* SPP. ORIGINATING FROM THE PRIMARY PRODUCTION LEVEL

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Introduction: *Clostridium difficile* is one of the most important enteric pathogens in both animals and humans, it can cause pseudomembranous colitis and food poisoning. Recent studies revealed that the infection with *C. difficile* can have a zoonotic potential and that farm animal can be a major source of contamination.
Aims: The aims of this study were to isolate *C. difficile* from pig feces using two different methods, inoculation on a special chromogenic agar ChromID® *C. difficile*-CDIF and the Real-Time PCR method and comparing the results depending on the age group and the isolation technique
Materials and methods: 48 samples were collected from two different pig farms. The pigs were divided based on their age and immunological status (young and adults, clinically healthy and with diarrhea). The samples were collected individually and directly from the rectal area, packed, labeled, and transported to the laboratory.
Results: Regarding the samples from the first farm, *C. difficile* was isolated from 6 out of 24 samples, with a percentage of 25% using the chromogenic agar. From the second farm, where the Real-Time PCR technique was performed, 10 out of 24 samples, with a percentage of 42% tested positive for *C. difficile*.
Conclusion: ChromID® *C. difficile*-CDIF is a selective chromogenic medium used in human medicine, which can also be used in veterinary medicine with the purpose of isolating *C. difficile* from animal samples. For the isolation of *C. difficile* from fecal samples, the Real-Time PCR method is more sensitive than the selective chromogenic agar.

Keywords: *Clostridium difficile* isolation, pig, Real-Time PCR.

BRANCHING PATTERN OF THE FEMORAL AND POPLITEAL ARTERIES IN THE GROUND SQUIRREL (SPERMOPHILUS CITELLUS)

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Introduction: The ground squirrel (Spermophillus citellus) is a small rodent from the rodent family (Ramos-Lara et al., 2014). It digs its tunnel system in which to hide if danger threatens. Ground squirrel is a real hibernator, and it is used as an experimental animal model in biological and physiological investigations. As the species of rodents, the ground squirrel is interesting for anatomical research of organs and its vascularization.
Aims: To describe the origin and distribution of the femoral and popliteal arteries in the ground squirrel and compare these data with those concerning other experimental animals.
Materials and Methods: The gelatine stained with lead oxide was injected into the abdominal aorta of six adult animals. For the visualization of arterial vessels of the distal part of the leg, mixture of gelatin and drawing ink was the contrast mass used for transparent embedding method according to a modified Spaltelholz method (Steinke et al. 2001). The ground squirrel is protected by low in the Republic of Serbia (The approval of the Ministry of Environmental Protection-No. 353-01-1185/2011-03) and an approval of the Ethics Committee of the Faculty of Veterinary Medicine in Belgrade-No. 01-218, 21.04. 2008.
Results: The deep femoral (a. profunda femoris), Ramus descendens (former a. femoris cranialis), muscular branches (Rami musculares), nutricia (a. nutritia femoris), saphenous (a. saphena) and caudal femoral (a. femoris caudalis) arteries arose from the femoral artery (NAV 2017). The cranial femoral artery arose from the femoral artery as a single vessel. The superficial sural artery originated from the short trunk of the caudal femoral artery. Its dorsal branch gave off deep dorsal metatarsal arteries III and IV (Aa. metatarseae dorsales profundae III-IV), and its plantar branch anastomosed with the caudal branch of the saphenous artery. Metatarsal arteries came from branches of the superficial sural, saphenous and popliteal arteries.
Conclusion: The results of this study are significant for comparative studies among different species of rodents and other small mammals. Also, the superficial position of the femoral artery in the femoral canal can be used as the main access site taking the pulse and blood sampling in experimentally induced hibernation of the ground squirrel.
Key words: arterial vessels, ground squirrel, hind limb

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MAY BACTERIA POPULATIONS STRUCTURE EXPLAIN THE OBSERVED POPULATION DECREASING OF *CAPREOLUS CAPREOLUS*?

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Introduction: *Capreolus capreolus* (roe deer) is a wild ruminant wildly distributed in Europe, being considered overabundant. Although, nationally roe deer may be considered an overabundant species having a population of 230.000 deer, while the optimal is 130.000 (MAP Ministry), in a particular area a decreasing of population size was observed. In addition, poor body condition, digestive signs and low fertility were observed. The reasons for this may be varied, in particular the presence of infectious diseases may result in mortality directly or indirectly by making the deer vulnerable to predators.
Aims: Considering these field observations, the aim of the present study was to evaluate the faecal bacteria population.
Materials and Methods: A total of 30 faecal samples were collected from different individuals in Ileanda village, Sălaj County, Romania. In addition, from one hunted individual tissue samples were available. The samples were cultivated and the obtained isolates were identified by PCR targeting the 16S rRNA followed by DNA sequencing.
Results: The most prevalent bacteria identified were: *Yersinia enterocolitica* (46.7%), *Pseudomonas* spp. (36.7%), and *E. coli* (33.3%). The infection prevalence with other identified bacterial species varied between 3.3-13.3%. Of particular interest was the isolation of one of each: *Y. pestis/Y. pseudotuberculosis, Listeria monocytogenes/L. seeligeri*, and *L. ivanovii*. The last was also detected in tissue samples in the hunted individual. Although, the identified bacteria were reported as comensal species while roe deer as reservoir host, all mentioned bacteria are opportunistic pathogens and may explain the following observations: high mortality rate (*Y. pseudotuberculosis*), digestive signs (*Y. enterocolitica, E. coli*) or reduced fertility (*Listeria* sp.).
Conclusion: The evolution of infectious diseases can influence the size of the deer population, also the presence of these bacteria with pathogenic potential, can represent an important risk in the state of health and the spread of the disease at the wildlife-livestock interface.

Keywords: Bacteria, roe deer, 16S rRNA

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STRUCTURAL PARTICULARITIES OF CARDIA GASTRIC REGION IN DOMESTIC RABBITS

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Introduction: The microanatomical structure of the digestive's system components is studied in detail in most domestic mammals, but in the domestic rabbit information regarding certain structures like the cardia is still scarce.
Aims: The aim of our study is to highlight the normal morphological characteristics and microscopical structure of the cardia region in domestic rabbit, regarding aspects like the overall appearance, structure, the gastric pits dimensions, density and the gastric glands component cells and features.
Materials and Methods: Tissue samples from cardia region were harvested and fixed in 10% buffered formalin, histologically processed and stained by Goldner's trichrome method. To examine the histological samples, we used an Olympus BX41 light microscope, equipped with an Olympus E-330 digital camera, to capture images.
Results: Microscopical examination has revealed the presence of gastric pits and glands in the entire cardia of the rabbit with morphological characteristics differing from one zone to another. Gastric pits have the smallest deepth immediate after the oesophagogastric junction, which gradually increase and after decreases as it aproaches the fundic zone. The gastric glands are made of by distinct cell types disposed in different ratio's. The glands near the oesophago-gastric junction are made of by cells with a serous secreting appearance on Goldner's trichrom staining, after their structure are made of by two cell types and as we approach the fundic zone there appear's a additional parietal cell type. Regarding the muscularis mucosa there were observed particular aspects like the disposition, composing cells arrangement different from the Chinchilla or Guinea pig.
Conclusion: The cardia region has highly developed chorion, in which the passing from the oesophageal mucosa to the gastric one is made suddenly with no transition zone. Gastric pits and glands appear immediately after the oesophago-gastric junction on the entire cardia, but with variable dimensions and density. The gastric glands structure is particular in order with the viewed zone, the types of cells encountered in the glands and their ratio being different. Between the cardia region and the fundic one there is a transition zone in which the gastric glands cell population is mixed. The cells composing the muscularis mucosa have a particular arrangement and their disposition being at distance from the upper structures.

Keywords: *Cardia,* rabbit, stomach

MONITORING METABOLIC CHANGES AND OXIDATIVE STRESS PARAMETERS IN INDUCED OBESITY IN RATS

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Introduction: The increase in pet obesity in recent years has led to further study the management of this pathology which is associated with a multitude of other diseases (Courcier, 2010). Obesity is the result of either excessive food intake or insufficient energy use, a common problem in animals raised without access to the outside environment or in which exercise does not meet the needs of the species or breed (Degeling, 2012).
Aims: The aim of this study was to induce obesity in groups of rats and compare the effects of two different types of diets (ND – normal diet and HFD- high fat diet). Moreover, the effect of supplementing these diets, with either plain flaxseed oil or flaxseed oil with an addition of powdered antioxidants (from two different plants - *Calendula officinalis* and *Ribes nigrum),* was observed by several determinations.
Materials and Methods: For this experiment, 32 male Sprague-Dawley rats were used from which whole blood was collected at the end of the 8 weeks long experiment and serum was obtained by centrifugation. Serum was further used for metabolic determinations and oxidative stress parameters.
Results: The combined use of antioxidants and flaxseed oil in HFD provoked a synergistic effect by lowering some metabolic parameters (TC and ALT) and all oxidative stress ones (CAT and TAC) in comparison with the obtained values in ND.
Conclusion: In the present research work, we demonstrated that this is an innovative combination as a supplement by monitoring the metabolic effect over both types of diets (ND and HFD).

Keywords: obesity, oxidative stress, metabolic syndrome, rat

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ANTIMICROBIAL RESISTANCE-CURRENT DATA REGARDING THIS PHENOMENON AND MEASURES TO MINIMIZE THE RISK OF ITS APPEARANCE AND SPREAD

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Introduction: The rising threat to human and animal health posed by the development of antimicrobial resistance (AMR) is recognised worldwide, alongside the urgent need for concerted action to limit its development. The economic aspect of this problem cannot be neglected: AM resistant infections result cause important healthcare and productivity losses in the European Union.
Aims: There are 3 essential measures that can bring us closer to a favorable result in terms of slowing down the emergence and spread of antimicrobial resistance: the development and application of a clear and demanding legislation, the monitoring of the sales and consumption of antimicrobials, and the training of current and future veterinary staff.
Materials and Methods: In the field of veterinary pharmaceuticals, the Regulation (EU) 2019/4 of the European Parliament is mandatory to apply. European countries annualy reports the volume of sales of antimicrobials to European Surveillance of Veterinary Antimicrobial Consuption (ESVAC) who publishes the collected data. The participation in various specialized meetings and dissemination of the received information, the exchange of experience and ideas between countries from all over the world helps to apply measures in order to reduce the incidence of antimicrobial resistance.
Results: The concerted application of the 3 measures had a very good effect, according to the latest ESVAC report: the volume of sales of antimicrobials in animals in Europe considerably fell.
Conclusion: In this paper, we want to bring the problem of antimicrobial resistance back to attention, and to make known the methods by which this phenomenon can be slowed down and with what results.

Keywords: antimicrobials, measures, resistance, threat.

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1. Regulation (EU) 2019/6 of the European Parliament and of the council on veterinary medicinal products;
2. Sales of veterinary antimicrobial agents in 31 European countries in 2019, 2020. Trends for 2010-2020;

THE ANTITUMOR EFFECT OF RHODOXANTHIN IN EXPERIMENTAL INDUCED MELANOMA IN MICE

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Introduction: Malignant melanoma is the most aggressive type of skin cancer, with the worst prognosis (Gastaldello, 2021). Its incidence grew significantly in the last decade in both humans and animals and unfortunately, the current treatment methods have several limitations. *Taxus baccata* is known mostly for its toxic components but recent studies mentioned a high concentration of carotenoids, the major one being rhodoxanthin, in its red arils (Dumitraș, 2022).
Aims: In view of these aspects, we aimed our focus on studying this retro-carotenoid isolated from the flesh of the red aril of *Taxus baccata* emphasizing its activity against B16F10 murine malignant melanoma.
Materials and Methods: The red arils were collected from plants growing in natural habitats and total carotenoid extraction and separation of rhodoxanthin were performed. The study was completed using 30 female C57BL/6J mice that were divided into 5 groups as follows: Control, MCT oil, Rhodoxanthin, Melanoma and Melanoma+Rodhoxanthin group.
Results: Following the oral administration of rhodoxanthin to the mice that were previously inoculated with B16F10 murine melanoma cells, the tumoral volume was decreased by 42.18%.
Conclusion: In the present study we demonstrated the effect of reducing tumor growth following the oral administration of rodhoxanthin in mice inoculated with 10^6 B16F10 melanoma cells.

Keywords: B16F10 melanoma, mice, rhodoxanthin, *Taxus baccata*

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MOLECULAR BIRD SEXING TECHNIQUES USED IN THE FOLLOWING REPTILE SPECIES: *CORRELOPHUS CILIATUS, PANTHEROPHIS GUTTATUS AND LAMPROPELTIS TRIANGULUM*

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Introduction: Approximately 50% of reptile species have sex chromosomes, among which, some species have X and Y chromosomes, and others Z and W. The genetic content for certain reptile lineages is highly conserved, therefore the Z and X chromosomes would be suitable markers for sexing method. (Rovatsos et al., 2015).
Aims: Taking into account the fact that birds evolved from reptiles, we consider that some reptiles with genetic determinism produced by the ZZ/ZW sex chromosomes may be sexed using the molecular genetics methods used in birds. Thus, with the help of PCR technique, we examined through three different techniques, three species of reptiles that have the ZZ/ZW sex chromosomes, to test the hypothesis.
Materials and Methods: DNA samples were collected from crested gecko (*Correlophus ciliatus*), corn snake (*Pantherophis guttatus*) and milk snake (*Lampropeltis triangulum*) using a sterile buccal swab or simply collecting shed skin. The ISOLATE II GENOMIC DNA kit was used for the extraction of the DNA. DNA amplification was carried out with the help of the TermoCycler C1000TM.
Results: Regarding the results of PCR amplification by the three methods used in birds, the result was inconclusive for the milk snake and corn snake. The DNA samples from the crested gecko, thought, showed a different result. One amplicon appeared for the female crested gecko and no amplicon for the male sample.
Conclusion: For the first time, we tested this assumption and found that the crested gecko can be sexed using the protocols used for birds. Further testing should be performed, comparing the results with other PCR techniques.

Keywords: DNA isolation, PCR, qPCR, reptile sexing

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HEMATOPOIESIS: A BRIEF OVERVIEW

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Introduction. Hematopoiesis represents the continuous process of formation of all the blood cells, that occurs throughout life, starting from the hematopoietic stem cells (HSCs) (Durand and Dzierzak, 2005; Tavian et al., 2010). Multiple studies have proved that this process is structured in two stages, the primitive wave and the definitive one, resulting in the production of all blood cell types: erythrocytes, neutrophils, eosinophils, basophils, monocytes, lymphocytes and platelets (Weiss and Wardrop, 2010).
Aim. The objective of this Review is to present the general aspects of this process for a better understanding, including the molecules that influence lineage-specific differentiation, hematopoiesis being one of the most important element in maintaining one's body homeostasis.
Materials and discutions. This Review describes hematopoiesis, from the beginning, starting with HSCs, throughout fetal development and adult life, including the niches of formation and maturation of hematopoietic stem cells and the factors that influence all the proliferation and differentiation processes. The niches of formation represent local microenvironments of bone marrow tissue which participate in the maintenance, functioning and quiescence of hematopoietic stem cells (Weiss and Wardrop, 2010). The factors that control all the processes of proliferation and differentiation are represented by transcription factors, physical cell-cell interactions and cytokines (Weiss and Wardrop, 2010); they are either produced locally, in the bone marrow, or they can be transported to this, through the blood, being produced elsewhere.
Conclusions. The study of hematopoiesis, stem cell plasticity and control mechanisms, offers the opening for interesting approaches for the investigation and treatment of various malignant, inflammatory, and degenerative pathological processes.

Keywords: Blood cells, hematopoiesis, hematopoietic stem cells

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COMPOSITIONAL QUALITY OF BAZNA PORK MEAT: COMPARATIVE STUDIES WITH GENETICALLY IMPROVED BREEDS

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Introduction: Pork meat is considered among the favorite culinary choices of consumers worldwide. In Romania, pigs' breeding is not only a meat industry but also a very ancient tradition.
Aims: Our current study aims to reveal these compositional aspects of Bazna pork meat, raised in traditional systems, and to compare the results found with those obtained from other breeds, raised in industrial systems.
Materials and Methods: Our study focused on 15 males adult Bazna pigs, bought from the SCDA Turda (Agricultural Research and Development Institution Turda) at the age of 4 months, and a live weight of approximately 30 kg. The animals were brought in a farm from Salaj county, and bred in an extensive care system, having access to the outside environment and being fed with cereals, grass and no concentrates. The sensory evaluation was made by three field specialists, which have assessed the exterior aspects, color, smell, consistency, tenderness and flavor of all the gathered samples. The biochemical parameters (fat%, protein%,water %, collagen %) were determined with the FoodScan Lab (Foss, Denmark) apparatus according to the standard protocol. The fatty acids profiles were assessed by classical GC method.
Results: From a compositional aspect, the quality of Bazna meat varies considerably according to the region of the carcass. The lowest fat percentage was found in the shoulder area (12.12%), followed by loin and flank. The highest protein percent (24.2%) was found in the loin muscles and the lowest in the flank area (16.19%). The collagen showed little variation among the various regions analyzed, being the lowest in the steak area (1.19%) and the highest (1.75%) in the shoulder area. Also, the fatty acids profile showed significant differences in values when compared to the results obtained by other researches.
Conclusion: From a quality and processing standpoint, Bazna pork meat has advantages over other industrially grown breeds used in production, rendered as a more intense coloration and better tenderness characteristics. It has also high nutritional values, showing a superior percentage of proteins and essential fatty acids than the pork meat found on the industrial market.

Keywords: pork meat, Bazna, quality

EFFECTS OF DONKEY MILK ON OXIDATIVE STRESS AND INFLAMMATORY RESPONSE

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Introduction: Oxidative stress refers to the imbalance between the generation and elimination of reactive oxygen species (ROS) in favor of the formation of oxidants in cells and tissues. Excessive ROS/oxidants produced in the process of oxidative metabolism can attack cells or tissues, leading to damage to the tissue structure and function, which promotes the inflammatory response in the body. Donkey milk is gaining interest due to its potential biological properties, such as antioxidant, anti-inflammatory, antimicrobial and antiproliferative activity. These effects are specifically attributed to some compounds, such as lysozyme, lactoferrin, casein, lactoperoxidase, vitamin C, polyunsaturated fatty acids (Guha et al., 2021) and essential amino acids (Li et al., 2017). Donkey milk and its related products have been shown to scavenge ROS, activate the antioxidant system and maintain the balance of intestinal flora *in vitro* and *in vivo* models.
Aims: This review aims to discuss the relationship between inflammation and oxidative stress; and to further systematically review the progress of recent research on donkey milk, mainly including its nutritional value and functional properties.
Conclusions: The specific targets involved in the inhibition of oxidative stress and inflammatory response signaling pathways by donkey milk should be assessed at molecular levels, and thus its qualities and impacts on health should be evaluated. Further research is necessary to isolate and identify effective constituents and develop more products to take advantage of the antioxidant properties based on modern technologies and to explore the regulatory mechanism in various disease models, especially those related to oxidative stress.

Keywords: antioxidant, bioactive peptides, Donkey milk, oxidative stress.

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CHANGES REGARDING GOAT MILK ENZYMATIC INFLAMMATION BIOMARKERS DURING SUBCLINICAL MASTITIS

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Introduction: Goat mastitis has become one of the most frequently diagnosed conditions in goat farms, with significant economic impact on the dairy industry. Inflammation of the mammary gland produces changes in milk composition that vary depending on the severity of lesions and the pathogen causing the infection (Leitner et al., 2004). Milk enzymatic activity undergoes significant changes, with indigenous enzymes, such as lactate dehydrogenase (LDH) and β-glucuronidase increasing during mastitis, thus being considered inflammation markers. Nevertheless, the milk somatic cell count (MSCC) is also increased in case of intramammary infection, but the correlation between MSCC and bacterial infections is not as simple as in cattle (Albenzio et al., 2011).
Aims: Taking into account the fact that LDH and β-glucuronidase are released more intensely during intramammary infections, the aim of this paper was to assess the enzymatic activity in milk collected from goats diagnosed with subclinical mastitis and to evaluate the influence of certain pathogens on MSCC, LDH and β-glucuronidase levels.
Materials and Methods: The MSCC was analyzed using Lactoscan SCC Analyzer and bacterial species identification was done using the Vitek® 2 Compact system. Enzymatic activity was evaluated by spectrophotometric methods.
Results: Milk samples positive for *S. aureus* had the highest level of MSCC, LDH and β-glucuronidase concentrations compared to samples positive for non-aureus staphylococci or other pathogens, whereas negative milk samples had lower values.
Conclusion: In case of subclinical mastitis, the enzymatic activity is positively correlated with MSCC and moreover, the concentration of these inflammation markers depends on different pathogens.

Keywords: β-glucuronidase, goat milk, lactate dehydrogenase, MSCC, pathogens

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EUROPEAN PERSPECTIVES ON ILLEGAL AND COUNTERFEIT PHARMACEUTICAL PRODUCTS

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Introduction: The quality of pharmaceutical products is the main guarantor of their therapeutic safety. Any deviation from the legal provisions can lead to serious problems in terms of safety and therapeutic efficacy of medicinal products (therapeutic ineffectiveness, adverse reactions, toxicity, deaths).
Aims: Awareness of the importance of identifying illegal and counterfeit medicinal products and of their distribution channels.
Materials and Methods: The legal requirements from the European legislation and the national legislation applicable to veterinary medicinal products, control methods described in the technical files, requirements of the European Pharmacopoeia for quality control, published works of European institutions were studied and deepened.
Results: Worldwide, the number of illegal or counterfeit medicinal products detected in the distribution chain is increasing. Counterfeit are fake medicines that are designed to mimic real ones and illegal are medicines that do not respect intellectual property rights. Such medicinal products have not been properly analyzed and evaluated to verify quality, safety and efficacy, and this could be harmful to patients' health. An important European tool to reduce the manufacturing and sale of illegal and counterfeit products is the MEDICRIME Convention. The scope of Convention is to provides a framework for cooperation between the relevant health, police and customs authorities both nationally and internationally, the adoption of measures to fight crime in collaboration with the private sector, the effective prosecution of perpetrators and the protection of victims and witnesses. The ICBMV laboratory plays an important role in detection of fake or illegal veterinary medicinal products that are marketing in Romania.
Conclusion: Solving the problem of illegal and counterfeit products involves the joint action of all competent institutions (competent authorities in evaluation, authorization and quality control, inspection bodies, customs, doctors, pharmacists, users, etc.) and compliance with the legislative framework in the field of medicinal products.

Keywords: counterfeit, fake, medicinal products

COMPARATIVE STUDY OF SEXING PIGEONS (*COLUMBA LIVIA*): ENDOSCOPIC SEXING VS. MOLECULAR SEXING

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Introduction: Common pigeons (*Columba livia*) have no distinct sexual dimorphic traits. In the studies carried out in this paper, sexing pigeons has been performed using two methods, surgical sexing by celioscopy and molecular sexing by PCR from various samples.
Aims: The aim of the paper was to compare the results of the two methods in order to evaluate their effectiveness.
Materials and methods: Twenty two deceased pigeons were included in this study. Coelioscopy was performed according to the method described by Divers, 2015. Necropsy was performed in order to identify the gonads. Samples of feathers, oral swabs and blood clots were collected post necropsy. DNA isolation was performed using the Isolate II Genomic DNA, Bioline kit. PCR was performed according to Griffiths et al. (1998) using P2/P8 primers.
Results: Endoscopic sexing had the lowest accuracy due to reduced visibility in the coelomic cavity caused by overlaying pathologies, such as intracoelomic hemorrhage or coelomitis. The decrease in accuracy of endoscopic sexing and identification of gonads by necropsy was caused by juveniles presenting less differentiated gonads. Regarding molecular sexing using various DNA samples, the most reliable results were obtained using blood clot samples, followed by oral swabs and finally, feathers. The most effective method of sexing the 22 pigeon cadavers included in this study was sexing through DNA testing, followed by necropsy and finally endoscopic sexing.
Conclusions: Molecular sexing using oral swab samples is the minimally invasive method recommended in pigeon sexing. This technique can also be applied to newly hatched chicks and can represent a very useful tool for the breeders.

Keywords: DNA sexing, endoscopic sexing, coelioscopy, oral swabs, pigeons

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ADAPTATION OF A CORROSION CASTING TECHNIQUE IN CARDIOVASCULAR RESEARCH IN SMALL ANIMALS SUCH AS THE WISTAR RAT'S

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Introduction: Corrosion casting is a research method used since the 15th century by injection of molten wax. Later, various substances were used, such as polyesters, silicones, and methacrylates. Most of the research conducted involves the use of these substances on medium animals, also on separate organs or organ systems.
Aims: To find and adopt a suitable method of corrosion casting to identify and highlight the arterial system in small animals, such as the rat, by injecting the entire circulatory system or only some organs.
Materials and Methods: 10 Wistar rats were used to adapt the technique. The technique itself was performed in several stages: 1) preparing the animal for injection; 2) injecting the individual; 3) soft tissue maceration.
Results: By testing several combinations of epoxy resin and acrylic dye, a variant was obtained that allowed obtaining a mold with improved elastic capacities compared to the mold made only of epoxy resin. The right elasticity was achieved by the combination of epoxy resin and acrylic dye. At the same time, the vessels are very well individualized, allowing their macroscopic examination but also with a stereo magnifier or even by electronic microscopy SEM (Scanning Electron Microscopy).
Conclusion: Through the method used, we brought both the viscosity and the temperature of the mixture to an optimal fluidity that allowed its successful penetration to the finest arterial ramifications. The vessels acquired firmness and elasticity that allowed their dissection and examination under optimal conditions.

Keywords: Corrosion casting, resin injection, Wistar rat, microcirculation.

SESSION 9: VETERINARY MEDICINE - CLINICAL SCIENCES

NEW APPROACHES IN THE FIGHT AGAINST ANIMAL TUBERCULOSIS IN SPAIN: ARE SMALL RUMINANTS IMPORTANT FOR ITS CONTROL?

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Introduction: Tuberculosis (TB) is a zoonotic infectious disease caused by *Mycobacterium tuberculosis* complex (MTC), which can affect a wide variety of animal species. Driven by scientific evidence, disease control has significantly evolved in the last decades from a close-minded view of disease management to a more holistic approach to the problem. Thus, today it is understood that an effective control of the disease should involve three key issues: 1) domestic hosts, 2) wild hosts, and 3) biosecurity. In Spanish Mediterranean ecosystems, where multiple TB animal hosts are present, identifying the role of the different species in the epidemiology of MTC is a key point to implement proper control measures. Despite the potential involvement of goats and sheep in TB epidemiology, these species are not subjected to routine TB testing. Therefore, the epidemiological information on MTC in small ruminants is still very scarce.
Aims: We aimed to determine the seroprevalence, spatial distribution and risk factors associated with MTC exposure in sheep and goats in Andalusia (southern Spain), a region with one of highest occurrence of MTC in both cattle and wild ungulates.
Materials and Methods: A total of 4421 serum samples from small ruminants were collected in 163 flocks between 2015-2017. Sera were analysed by an in-house ELISA using the P22 protein complex as coating antigen.
Results: Antibodies against MTC were detected in 0.7% (16/2266; 95%CI: 0.4-1.1) of sheep and 21.1% (454/2155; 95%CI: 19.4-22.8) of goats. Seropositivity was found in 14.5% (12/83) and 96.3% (77/80) of the sheep and goat herds, respectively. Spatial analysis identified one statistically significant cluster including 12 goat farms (Radius: 104 km; Relative Risk: 2.3; $p < 0.001$) in the eastern part of Andalusia. In sheep, semi-extensive management system was identified as risk factor associated with MTC seropositivity. In the case of goats, the main risk factors associated with MTC exposure were: management system (intensive and semi-extensive), the census of the farm (>241) and the presence of a lazaretto inside the main building where the animals are housed.
Conclusion: MTC is widespread in the small ruminant populations in southern Spain. However, while sheep may play a limited role in the epidemiology of TB, our results suggest that goats could be relevant in the transmission and maintenance of MTC in the multi-host community of this region.

Keywords: Disease control, small ruminants, tuberculosis.

MOROPHOCYTOMETRIC EVALUATION OF EQUINE OOCYTES FOLLWING *IN VITRO* MATURATION

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Introduction: Unlike common farm animals (cattle, sheep and goats), assisted reproductive technology (ART) in horses was initiated by the application of artificial insemination technology during the nineteenth century, and these procedures resulted in obtaining pregnancy rates (Heape, 1898). Due to its importance, many studies have indicated that the success of the *in vitro* embryo production process is related to a set of factors (e.g., training, experience and proper equipment). The above factors would raise the rates of maturation, fertilization and subsequent division processes in early embryos (Valenzuela et al., 2017).
Aims: The main objective of the current study is to investigate the developmental potential of horse oocytes collected by aspiration and ovarian scraping methods based on the morophocytometric evaluation and *in vitro* maturation.
Materials and Methods: All selected oocytes (930 oocytes) were matured for 27 h at 38.5^{0}C in an atmosphere of 5% CO_2 in humidified air. The maturation medium consisted of 25 mm hepes-buffered TCM-199 supplemented with 2 mm sodium pyruvate, 1mm l-glutamine, penicillin (75 mg/ml), streptomycin (50 mg/ml) and 10% fetal calf serum. Following maturation, matured oocytes were examined to investigate for the first polar body formation. The morphometric assessment was performed using the motic image plus (MIP) software with an inverted microscope. Across oocyte groups, a set of targeted characteristics were studied and compared (zona pellucida thickness, cumulus oophorus thickness and oocyte diameter).
Results: Morphometric examination results showed highly significant differences ($p<0.001$) among groups of matured oocytes (zona pellucida thickness; <13 µm, cumulus oophorus thickness; < 10 µm and oocytes diameter; < 100 µm), where the rates were 63.39%, 33.59% and 30.58%, respectively. The results of morphocytometric evaluation based on zona pellucida thickness, cumulus oophorus thickness and oocyte diameter of the total 765 cultured oocytes showed that 197 oocytes (25.75%) were classified as excellent mature, 108 oocytes (14.11%) as mature good, 203 oocytes (26.53%) as immature and 257 oocytes (33.59%) were considered as degenerated.
Conclusion: It is concluded that the oocyte rates differed according to the parameters (cumulus oophorus, oocytes diameter, zona pellucida).
Keywords: equine, oocyte culture, oocyte diameter, maturation, morphometric assessment.

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THE EFFECTS OF METAPHYLAXIS WITH MACROLIDES-TULATHROMYCIN IN GOAT POPULATIONS: HEMATOLOGICAL AND BIOCHEMICAL ASPECTS

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Introduction: Tulathromycin is a long-acting semi-synthetic macrolide, and an antibacterial that is approved for use in cattle and swine and may have utility for goats. The use of tulathromycin in goat is based on its complex and differentiated mechanisms of action, such as: reduction of infectious pressure through the antimicrobial effect; reduction of tissue destruction through the anti-inflammatory effect; reducing and combating the phenomena of antibiotic resistance in animal and later in human populations; and also an important reduction of the oxidative stress.
Aims: The goal of this study was to investigate the major variations of the biochemical and hematological parameters in a healthy goats population treated with thulatromicin.
Materials and methods: The study was carried out on 5 adult female Carpathian goats, aged 4 to 10 years, body mass 22-38 kg, reared in a traditional system on subalpine pasture. The animals were inoculated im with tulathromycin (sol. 100 mg/ml, innoulated im with 0.5 ml/20 kg), twice at interval on 7 days. Before and after inoculation of tulathromycin , blood samples were taken on EDTA for haematological examination, and on heparin for biochemical examination. The results obtained were statistically processed and mean (x) and standard deviation (±s) were calculated.
Results: The hematological exam consisted in determination of hemoleukogram and for serum biochemical examination were determined: GLDH, ALAT, ASAT, PAL, GGT, CK, Total Protein, Albumin, μ-globulin, Haptoglobin, Urea, Creatinine and Ca. Compared to the reference values (T0-before 1st administration) there are no noticeable changes for the hemogram components (E, Hb, Ht), but important variations in total leukocytes (WBC) are noticed, which increase at T1 (after 2nd administration) to values situated between 14.02x109/L and 25.70x109/L in all animals, compared to the reference values from the literature (4-13x109/L). The most important increases affect the lymphocytes, neutrophils and monocytes. The values of biochemical parameters are within the reference limits for this species at T0, but there are significant variations in some of these parameters at T1. Thus, alkaline phosphatase (ALP) increases 3 to 20 times the normal values (60-200 U/L) at T1, with values ranging from 572.5 U/L to 2726.6 U/L. Changes of lesser magnitude are also observed for the other biochemical parameters determined (GLDH, GGT, CK).
Conclusions: The im. administration of tulathromycin to adult goats does not cause significant changes in the blood count components (hemogram), but induces significant increases in total leukocytes. Of the biochemical parameters studied, only the alkaline phosphatase (ALP) increased much above normal values.
Keywords: metaphylaxis, tulathromycin, goats, serum biochemistry, hematology.
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COMPARATIVE PROTOCOLS FOR THE TREATMENT OF FELINE LOWER URINARY TRACT DISEASE (FLUTD)

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Introduction: Feline lower urinary tract disease is a complex, often multifactorial pathology of great clinical importance among domestic cats. Although there are several therapeutic approaches for patients with FLUTD, it is recommended as the first goal, hydro electrolytic rebalancing along with the permeabilization of the urethra. Because invasive procedures, such as catheterization, can induce several complications, minimally invasive protocols are preferred among clinicians.
Aims: Comparative verification of the effectiveness of classical therapy compared to a minimal invasive protocol in order to avoid the installation of complications and quickly obtaining healing.
Materials and Methods: Between 2019 and 2020, 78 domestic cats accusing signs of FLUTD presented for consultation at the department of Medical Pathology and Semiology, Faculty of Veterinary Medicine, Cluj-Napoca, of which 72 benefited from classical therapy, and 6 benefited from a minimally invasive protocol proposed by Cooper et al. in 2010.
Results: Among the 78 cats that received the classic therapy, 52 (67%) were sedated and urethral catheterization was performed, 16 patients (20%) received only antispastic medication, for 4 patients (5%) cystotomy was necessary, and 6 patients (8%) benefited from minimally invasive therapy. The minimally invasive protocol had a 100% success rate, with no complications, compared to the classic methods in which we had complications among 5 patients out of 72.
Conclusion: The minimally invasive protocol can be considered as a safe method of urethral permeabilization because no complications were observed in the patients, compared to the classic protocol that led to complications (7%).

Keywords: FLUTD, classical therapy, minim invasive therapy, urethral permeabilization.

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EVALUATION OF A GENICULAR AXIAL PATTERN FLAP USED FOR A LARGE TIBIAL REPAIR IN A CAT

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Introduction: Closure of large cutaneous defects of the distal part of the limbs is difficult in small animals. This is due to the lack of elasticity in this area and unavailable skin in the adjacent areas (Swaim et al., 2015). Axial pattern flaps are used to cover various types and defects and since they incorporate a direct cutaneous artery and vein that provides nutrition for the skin in that area, are a great solution for these lesions (Wardlaw et. al, 2017). In this particular area, a caudal superficial epigastric flap would be an option, but might not be long enough to cover the full area. The use of genicular flaps, using the genicular artery have been successfully reported in dogs (Ober et. al, 2019) and could also be a good option for large defects in this area, in cats.
Aims: The aim of this study was to evaluate weather a genicular axial pattern flap would provide could coverage and healing of a large tibial defect in cats. To our knowledge this is the first description of the use of this flap in cats.
Materials and Methods: Luke, a 6 years male Sphynx cat, was presented to our clinic, with 3 skin defects caused by previous trauma. A first attempt at closing these defects had been performed by another veterinarian but had been unsuccessful. The largest of the 3 defects was on the medial tibia, covering almost all the distance from the knee to the tibio tarso metatarsal joint. The procedures were performed in 2 surgical steps, debridement and obtaining a healthy granulation tissue being the first goal, with the flap being the 2nd surgery and performed aproximately 2 weeks after. Ozone therapy was used to promote healing while waiting for a good granulation bed.
Results: Two weeks after the second surgery, we could observe that around 85% of the flap was viable, with full closure being obtained through secondary healing 2 months postop.
Conclusion: The genicular flap provided a full thickness skin coverage in a cat with cutaneous defect in the tibiotarsal region and is a viable option also in this species for reconstructive surgery in this area.

Keywords: cat, genicular axial pattern flap

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AN AESTHETIC SURGICAL SOLUTION FOR THE TRAUMATIC ANTERIOR POLE SYNDROME OF THE EYE WITH MATURE CATARACT LENS AVULSION IN A DOG, CASE REPORT

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Introduction: The traumatic syndrome of the anterior pole of the eye is characterized by an association of lesions of the anterior ocular structures due to a trauma to the eye, involving all the structures of the anterior pole of the eye. In this case study, the syndrome is characterized by an open traumatic ocular contusion in which the central cornea has been ruptured, the aqueous humour has been lost with anterior chamber collapse, and the hard, mature cataractous lens has been dislocated and avulsed from the eye.
Aims: We pursued a different surgical approach to canine ocular trauma with eyeball rupture and lens avulsion for aesthetic purposes through the surgical reconstruction procedure using an intraocular lens (IOL).
Case presentation: Our case report involves a 17 years old female dog, Pekinese breed, previously diagnosticated with mature bilateral cataract, purulent bilateral conjunctivitis, total left eye corneal opacification and uncertain data of treatments applied. The dog suffered a traumatic accident due to his blindness in the left eye. At the request of the dog's owner, instead of the surgical procedure of ocular enucleation, for aesthetic reasons, the surgical reconstruction of the anterior pole of the eye was performed. To stabilize the eye structures, we chose to implant an IOL. Because both the anterior lens capsule and lens suspensory ligaments were affected, we could not stabilize the lens chamber with a tension ring, so we had to choose an IOL that fit properly. We implanted a human Sensar IOL model, 3-piece, biconvex acrylic, C haptics modified blue polymethyl methacrylate. We ended by putting a an-bandage lens on the cornea.
Discussions: Postoperatively, the dog's recovery was good, and the eyeball looked firm and beautiful, but slightly smaller than the right eye and with astigmatism.
Conclusion: Our case report reveals a good elective aesthetic surgical solution for eyeball reconstruction with IOL implantation.

Keywords: An-bandage lens, dog ophthalmology, eye aesthetic-traumatic surgery, intraocular lens IOL, mature cataract.

THE EFFECTS OF DIFFERENT DOSES OF ROCK INHIBITOR, ANTIFREEZE PROTEIN III AND BORON ON FREEZING OF ANKARA BUCK SEMEN

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Introduction: Freeze-thawing process results in loss of sperm motility and viability, deterioration of acrosomal and plasma membrane integrity and DNA damage. Inclusion of some additives in freezing extenders improves the quality of semen following thawing (kaynaklar).
Aims: The effects of Rock Inhibitor Y-27632, Antifreeze Protein III and Boron at two different doses were investigated at the Ankara buck sperm parameters after freeze-thawing.
Materials and Methods: Semen samples, which were diluted with a Tris-based extender containing Rock inhibitor (Y-27632; 5 and 20 µM) and Antifreeze Protein III (1 and 4 µg/ml), Boron (0.25 and 1 mM) and an extender containing no additive (control) at 35-37 °C, and loaded into straws. Sperm samples frozen in liquid nitrogen vapor following equilibration were stored at liquid nitrogen.
Results: It was observed that 5 and 10 µM (71.82±2.16 and 74.04±1.59 %) of Rock inhibitor and 0.25 and 1 mM doses of Boron (76.36±1.80 and 72.08±1.99 %), compared to the control group (66.15±1.51 %), improved post-thaw motility ($P<0.01$). Considering the evaluation of acrosomal integrity and mitochondrial activity, all groups did not provide protection statistically significant ($P>0.05$). It was observed that DNA damage was improved by Antifreeze Protein III 1 µg/ml (1.23±0.23 %) and Boron at all doses (0.25 mM: 1.83±0.39 % and 1 mM: 1.18±0.23 %), compared to the control group, (3.37±0.70 %) ($P<0.01$) following the thawing process.
Conclusion: In the present study, It was determined that some additives added to the extender provided significant improvements on the buck spermatozoa motility and DNA damage after thawing.

Keywords: Ankara buck, antifreeze protein III, boron, ROCK inhibitor, semen freezing.

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SHOCKWAVE THERAPY IN EQUINE PROXIMAL SUSPENSORY DESMITIS

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Introduction: In athlete horses, *interosseous medius* (suspensory ligament, SL) desmitis is a frequent and complex cause of primary and compensatory lameness. Despite current advances in pharmacology and rehabilitation therapies, its healing is still problematic, without any guarantees for the horse to regain previous performance levels (Kornicka-Garbowska et al., 2019).
Aims: The aim of this study was to present the use of shock wave therapy (SWT) applied in the therapy of equine suspensory ligament desmitis: frequency of use, ultrasound aspects, and clinical efficacy.
Materials and Methods: The study-sample consisted in 24 carriage-driving, show, and jumping horses, diagnosed by ultrasonography and Doppler as having SL desmitis. Eight of them, the controls, had been managed conservatively for spontaneous healing; the other 16 horses received three SWT treatments at three-week intervals. During this period the healing was monitored, then followed up for several weeks, by ultrasonographic exams, in both groups.
Results: Starting with the third SWT treatment the diameter of the intra-tendinous lesion differed significantly ($P < 0.06$) when the healing was compared between the two groups. Moreover, the horses subjected to SWT returned to training much faster than those in the control group, and had satisfactory competitive performances. According to our observations excessive energy or pulses of the SWT can result in tendon damage.
Conclusion: The corroborative analysis of ultrasonographic findings, clinical data, and competitive sport-performance in this study showed that SWT facilitates the SL lesions' healing in horses, resulting in faster filling of the SL defect compared to conservative management.

Keywords: athlete horses, shockwave therapy, suspensory ligament desmitis.

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QUANTITATIVE LAMENESS ASSESSMENT IN HORSES BY USING AN ACCELEROMETER-BASED SIMPLE DEVICE

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Introduction: Because its widespread occurrence, diagnosing lameness in horses is one of the main work-areas of all equine veterinarians, requesting good experience and observational skills. Besides the well-known subjective assessment methods, the constant technological improvements in medical diagnostics led to the development of objective measurement devices for quantitative gait analysis, but their prices can be limitative, especially for beginner practitioners.
Aims: The present study focused on completing the classical subjective lameness assessment with quantitative measurements by using a self-constructed, simple, affordable lameness detector device. Our hypothesis was that our instrument can be a useful equine lameness screening tool.
Materials and Methods: In a university hospital 42 adult sport-horses, all lame in one hind-leg, had been assessed by both subjective evaluation (AAEP lameness scoring system), and using the original Lameness detector 0.1 twice (before and after intra-articular anaesthesia). All the obtained data (AAEP lameness scores and electric impulse numbers on the three axes if our device's accelerometer) was statistically processed to verify our hypothesis.
Results: The mean number of impulses on the accelerometer's X axis showed significant differences ($p<00.1$) between the two assessments for the overall number of horses and also for those with scores of 3/5 on the AAEP scale, decreasing after the joint block (due to gait improvement). On the Y axis the differences were significant ($p<0.05$) for the horses scoring 2/5 and 3/5 on the AEEP scale, with increasing number of impulses as the lameness decreased. The mean number of impulses recorded on the Z axis showed the less specificity.
Conclusion: The Lameness detector 0.1 device proved to be an efficient screening tool for diagnosing lameness and its severity in the assessed horses, with best relevance when the mean number of impulses was considered, and especially on the accelerometers' X axis.

Keywords: accelerometer, equine lameness, kinematic locomotion exam

ANESTHESIOLOGICAL IMPLICATIONS IN EXPERIMENTAL INDUCTION OF HEMORRHAGIC SHOCK IN RABBITS

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Introduction: Rabbits are notoriously sensitive to anaesthesia, this includes handling-induced stress and apnoea during induction of anaesthesia. Furthermore, apnoea is often accompanied by bradycardia and secondary hypoxia and hypercapnia, which are not prevented by pre-anaesthetic medication, that limits the use of rabbits as experimental models.
Aims: The aim of the study was to evaluate the efficiency of various anaesthetic protocols on experimental haemorrhagic shock in rabbits, able to maintain the vitals in physiological ranges and prevent respiratory and cardiac failure in prolonged anaesthesia.
Materials and Methods: The study was conducted on 8 New Zeeland White rabbits. Various anaesthesiology induction protocols were used such as: xylazine-ketamine, ketamine-dexmedetomidine, ketamine-dexmedetomidine-isoflurane, midazolam-dexmedetomidine-ketamine. Premedication analgesics were added with Buprenorphine and Meloxicam. Maintenance was provided with inhalatory isoflurane and constant rate infusion ketamine. Haemorrhagic shock was induced using the left carotid artery which was preliminary surgically cannulated using 20 Gauge catheters. The blood withdrawal consisted of 40% of total blood volume in each experimental model. Constant monitoring during the procedure reviewed vitals such as heart rate, respiratory rate, systolic, diastolic and mean arterial pressure, core body temperature, capnography and oxygen saturation.
Results: All induced models presented mild to moderate respiratory complications independent of the anaesthesiology used protocol. Additionally, rabbits required complementary opioid medication in premedication for analgesia maintenance. One of the most frequent challenges was anaesthesia induced hypotension. Thus, maintenance of adequate arterial pressure was necessary for proper conduct of the experiment.
Conclusion: In the present work, we demonstrated that the combined use of opioid and nonsteroidal anti-inflammatory, dexmedetomidine and ketamine in anaesthetic induction, along with isoflurane and constant rate infusion ketamine is the most efficient anaesthesiology protocol for inducing experimental haemorrhagic shock in rabbits.

Keywords: Anaesthesiology, haemorrhagic shock, rabbits

CT SCAN MEASUREMENTS OF RABBIT ABDOMINAL CAVITY WITH AND WITHOUT INDUCED PNEUMOPERITONEUM – PRELIMINARY STUDY

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Introduction: Pneumoperitoneum is induced by insufflating carbon dioxide into the abdominal cavity. The pre-set pressure of insufflation leads to cardiovascular and respiratory changes related to the set value, as well as physical changes of the abdominal cavity. (Kabakchiev et al, 2020). An intraabdominal pressure (IAP) above 8 mmHg was shown to have no clinical significance regarding the surgical workspace in rabbits. (Kabakchiev et al., 2020).
Aims: Taking into consideration the dimensions of abdominal cavity in rabbits, the aim of this study is to assess the effect penumoperitoneum has on the abdominal wall and organs.
Materials and Methods: CT scans of four New Zealand adult rabbits were used to measure the linear and volumetric dimensions of the abdominal cavity. Each rabbit was scanned without and with induced pneumoperitoneum at a IAP of 8 mmHg. In sagittal and axial planes, the abdominal internal diameter and height of the visceral mass were measured. The abdominal internal diameter was measured also in coronal plane.
Results: A lengthening of the abdominal diameters and a shortening of visceral height were observed and deemed statistically significant ($p < 0.01$).
Conclusion: Based on the results from this study, induced pneumoperitoneum has an impact on the shape and dimensions of abdominal wall. Further research should be done in order to understand the clinical relevance and how to improve surgical workspace in rabbits minimally invasive surgery.

Keywords: CT scan, laparoscopy, penumoperitoneum, rabbit, workspace

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A REVIEW OF THE DIAGNOSTIC TECHNIQUES OF *ENCEPHALITOZOON CUNICULI* IN DOMESTIC RABBITS (*ORYCTOLAGUS CUNICULUS*)

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Introduction: *Encephalitozoon cuniculi* is a eukaryote, unicellular, spore-forming, obligate intracellular microorganism of the phylum Microsporidia, with domestic rabbits as the main host. Other species in which this pathogen was identified are goats, pigs, horses, monkeys, foxes, dogs, cats, mice and most importantly humans, the infection being therefore called a ”zoonosis”. The transmission is done via the horizontal route, through contaminated food, water or urine, and the vertical route, from doe to kit. The cell-mediated immunity has a superior role compared to the humoral immunity in the protection of the infected host. Encephalitozoonosis can manifest itself as an acute infection, with neurological signs such as torticollis, tremors, seizures, nystagmus, paresis and/or paralysis, but also phacoclastic uveitis, polydipsia and polyuria. Chronic infection and subclinical infection are unfortunately harder to be observed, as the rabbit can be a carrier of the microorganism without showing any clinical signs. The diagnostic techniques usually carried out are histological examination, serological tests and molecular genetic techniques. The treatment of encephalitozoonosis in rabbits is the most challenging part, a combination of antiparasitic drugs, anti-inflammatory drugs and antibiotics being usually used, but with unrewarding results. Prevention measures are represented by periodical serological screening, prophylactic administration of fenbendazole and maintenance of a clean environment.
Aims: The purpose of this article is to review the current data regarding the pathogenesis, host immunity, clinical signs, diagnostic methods and treatment of encephalitozoonosis in the domestic rabbit, as well as an analysis of the prevalence of this disease in different countries of the world.
Conclusion: The various diagnostic tests for *Encephalitozoon cuniculi* in rabbits up to date show the continuous interest in finding the best method of not only identifying the disease in the rabbit population, but also in the importance of preventing it among animals and humans.
Keywords: *Encephalitozoon cuniculi*, encephalitozoonosis, *Oryctolagus cuniculus*, rabbit, diagnostic tests

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HYSTHEROPATHIES IN FEMALE DOGS: INCIDENCE, DIAGNOSTIC AND SURGICAL APPROACHES - A UP-DATED MINI-REVIEW

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Introduction: In the present work, as a bibliographic research, the aspects related to the anatomy, physiology and uterine pathology in bitches are presented. The existing methods of sampling to establish a more accurate diagnosis are also exposed. This review presents the known elements related to this pathology with the mention that the pathogenetic mechanism, especially at the molecular level, is not fully known. For being conceptually an inflammatory disorder, it is assumed that pyometra involves endometrial proliferation changes, the action of inflammatory mediators, and consequently vascular changes of the endometrium The hyperplastic cystic endometritis-pyometra complex is one of the most common uteropathies in bitches, being one of the major causes of infertility. Compared to 10 or 20 years ago, today veterinarians are increasingly asked to solve female fertility problems due to the increased demand for purebreds, including financial and emotional elements. The main symptom of endometritis is a noticeable vaginal discharge. When it progresses to pyometra, symptoms include an increased abdomen, lethargy, depression, reduced appetite, vomiting and frequent urination. In diseases with mild or obscure clinical signs and normal uterine size, a diagnosis based on a clinical assessment might be incorrect.
Objectives: Evaluation of diagnostic methods in hyperplastic cystic endometritis, as a presumed precursor in the pathology of pyometra in bitches.
Conclusion: This research provides new ways of minimally invasive surgical diagnosis of uterine conditions in the female dog. The goal being the most specific preventive and therapeutic one, it can lead to the preservation of the reproductive function.

Key words: bitch, endometritis, pyometra, minimally invasive surgery, infertility.

SIMPLE CONTINUOUS VERSUS CUSHING SUTURE FOR JEJUNAL END-TO-END ANASTOMOSIS IN THE DOGS: A COMPARATIVE STUDY

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Introduction: For the anastomosis of canine jejunum, single-layer appositional closures are preferred to inverting or everting patterns, whereas inverted or everted closures require second-intention healing and increase the risk of luminal stenosis or anastomosis site leakage. Nevertheless, following simple continuous sutures, the dehiscence rates remain high.
Aims: Our objectives were to compare the appositional simple continuous sutures with the inverting Cushing sutures, investigating: suture resistance, bursting pressure, lumen diameters on canine cadavers, as well as survival and complication rates in canine clinical cases.
Materials and Methods: An ex vivo experiment and a retrospective clinical study were carried out for these purposes. The suture resistance, bursting pressure, lumen diameters on canine cadavers, as well as survival and complication rates in canine clinical cases. were done.
Results: Our ex vivo experimental results indicate that: the efforts to which sutures are submitted to in anastomoses are minimal for the Cushing suture, the differences between the bursting pressure measured for the two types of sutures indicate the superiority of the Cushing suture the difference in size of the anastomoses' lumen between the two sutures are minimal. The retrospective analysis of 511 intestinal resections and end-to-end anastomoses performed (123 - simple continuous sutures and 388 - Cushing sutures) revealed 7 anastomotic complications (consisting of 3 dehiscences, out of which 2 had generalized peritonitis, and 4 adherential complications), all following simple continuous anastomoses.
Conclusion: In the present research work, we reveal the superiority of the Cushing suture, compared to simple continuous suture, which emphasizes the fact that the Cushing suture should be considered a good option when performing end-to-end jejunal anastomoses in the canine patient.

Keywords: bursting pressure, Cushing suture, diameter of the anastomoses, end-to-end anastomosis, jejunum

MANAGEMENT AND VETERINARY PRACTICES IN REDUCING THE RESPIRATORY INFECTIOUS PRESSURE IN CALVES

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Introduction: In a society that is constantly changing economically as well as epidemiologically, the "One Health" concept brings together the concern of the etiological and pathogenetic approaches to some herd diseases in veterinary medicine both from the point of view of the importance of intrinsic and extrinsic factors, as well as from that of the sanitary/zoonotic impact.
Aims: Monitoring the general results achieved by using protocols based on specific conditions (environmental, infectious, immunological, epidemiological parameters) on a calf farm.
Materials and methods: A literature review on the results of management and veterinary protocols applied to ensure animal health and welfare of farmed fattening calves.
Results: Preventive medicine is one of the essential entitlements within the "one health" concept, being indispensable for the good functioning of production farms (OIE-WHO, 2014). Implementing preventive measures to maintain the health and well-being of animals, with direct influence on patients and indirect but immediate influence on humans is vital in the actual health framework. However, this type of approach to the veterinarian's work is neglected due to clinical priorities at the expense of organizational prevention ones. If the doctor will focus only on clinical intervention, there is a risk that the perspectives of his work will be limited and economically conditioned. In calf farms, microbial respiratory diseases prevail at a young age, their method of prevention being practically dictated by the big drug companies, which carry out studies only for immediate profit and only on the product in question.
Conclusion: A new vision of the veterinarian is needed in finding practical, economically efficient solutions as well as the definition of the optimal moments for their implementation, for the prevention of respiratory diseases with immediate or long-term impact.

Keywords: calves, extrinsic factors, microbial respiratory diseases, preventive protocols

PASSIVE HIP JOINT LAXITY MEASUREMENT IN DOGS

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Introduction: Canine hip dysplasia can be defined as the radiological evidence of joint laxity and/or the presence of osteoarthritis, being known that an increased joint laxity is among the risk factors in the occurrence of osteoarthritis. Passive joint laxity is a subjective measurement of a canine hip laxity on the radiographic image. Passive joint laxity can be measured with a distractor, which causes a slight displacement of the femoral head from the acetabular cavity when a minimum compression is determined on the distal tibia. Worldwide, there are three types of distractors for measuring passive hip joint laxity in canine patients. PennHIP distractor dedveloped by dr. Gail Smith in 1993 at the University of Pennsylvania, Vezzoni Modified Badertscher Distension Device (VMBDD) developed by animal health foundation from Italy and the Dis-UTAD device designed by dr. Ginja Mario from the University of Trás-os-Montes and Alto Douro, Portugal. On the radiological image, passive joint laxity will be calculated by determining the distraction index (DI - by PennHIP) or laxity index (LI by VMBDD) which is measured by dividing the distance between the center of the femoral head and the center of the acetabular cavity to the radius of the femoral head. The values will be between 0-1, while values between 0-0,3 will be considered normal, values between 0,3 – 0,7 will be regarded as moderate risk for developing osteoarthritis, and values over 0,7 will be viewed as a high risk for developing osteoarthritis secondary to canine hip dysplasia. In order to reduce the incidence of canine hip dysplasia in a population, veterinarians should determine the average of DI/LI for that population, and select for breeding only those specimens with a DI/LI below the population average.
Aims: The aim of this study was to determine the DI/LI, using different methods, in different breeds of dogs under the age of one year
Materials and methods: In the present study, the data and X-rays of 29 canine patients were processed, including 10 different breeds, aged 3-12 months, 15 being males and 14 bitches. 14 cases were registered from the Department of Veterinary Medicine and Animal Sciences (DIVAS) at the University of Milan with VMBDD device and 15 cases were registered from Veterinary Orthopedic Trauma Center from Arenzano, Italy with PennHIP device. The distraction index/laxity index was measured with PostDICOM™ viewer and statistical analyses were made in the IMB SPSS STATISTICS™ program.
Conclusion: Out of the total of 29 patients, only 2 of them had a DI/LI below the reference value of 0.3, they have practically under 30% chance of developing osteoarthritis during their lifetime and only 12 of them had the DI/LI index below the breed average, thus being liable to be included in the breeding programs.

Keywords: canine hip dysplasia**,** distraction index, laxity index, passive hip laxity, PennHIP method

TENDON INJURIES IN HORSES: A COMPARISON OF MODERN THERAPIES

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Introduction: A main challenge of equine regenerative medicine is finding the optimal method for curing tendon injuries. Among the most common orthobiologics used in the horse, both platelet-rich plasma (PRP) and mesenchymal stem cells have been found to improve the quality of the repair tissue and prevent reinjury–a permanent risk of scar development during spontaneous healing.
Aims: The present study compared the efficiency of stem cells and PRP as therapeutical options in equine tendon injuries, considering the occurrence of reinjury, return-time to competitions, and post-healing competitional performance in the studied horses.
Materials and Methods: The 24 studied horses, all with flexor-tendon injuries, had been divided in three groups. The tendon-lesions in the control group (8 horses; 2-11 years-old) were left to spontaneously heal, being conservatively managed. In the PRP-treated group (8 horses; 6-13 years-old) the lesions had been injected with PRP two days after the injury's occurrence. The patients in the stem cell treatment group (8 horses; 7-15 years-old) received this therapy ten days after being injured. The tendon-healing process had been ultrasonographically monitored in the seventh, 14th, and 21st day post-therapy or post-inclusion in the study, for the horses in the control group.
Results: The ultrasound measurements of the tendon-lesions showed the beneficial effect of both treatment options compared to the control group ($p_{PRP} = 0.0145$; $p_{stem\ cells} = 0.0199$), with statistically significant differences between the two therapy-groups ($p = 0.0044$). Although the differences were relatively small, the group treated with stem cells recorded a return to sport-activity 1.5 months faster than the PRP-treated group ($p_{PRP} = 0.0044$), and 6.25 months earlier than the control group ($p_{control} = 0.0008$).
Conclusion: Both modern therapies improved considerably tendon-healing in the studied horses. The stem cell therapy was more efficient than the PRP, allowing a delay in performing it, yet leading to faster healing.

Keywords: PRP, regenerative medicine, stem cells, tendon injuries

COMPARATIVE ASSESSMENT OF TWO ANALGESIA PROTOCOLS DURING OVARIOHYSTERECTOMY IN RABBITS

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Introduction: The present study aims to evaluate two analgesia protocols, FLK (fentanyl, lidocaine and ketamine), respectively Buprenorphine during ovariohysterectomy in rabbits. The mortality rate during anesthesia is higher compared to dogs and cats. In this species, it is recommended to institute a multimodal protocol for giving an acceptable degree of analgesia throughout the intraoperative and postoperative period. Multimodal anesthesia involves the administration of microdoses of anesthetic substances at a constant rate of infusion (CRI) throughout and after surgery.
Aims: Motivation of the work started from the assumption that FLK administered in CRI has several advantages. First of all, FLK has superior analgesia properties compared to other protocols due to constant maintenance of plasma concentration, avoiding under-dosage and overdosage of medication. Secondly, due to the microdoses used in this infusion, the incidence of cardiopulmonary adverse reactions is lowered.
Materials and Methods: Eight females belonging to different breeds were included in this study. These eight cases were divided into two groups: the FLK group (n=4) and the Buprenorphine group (n=4), without the author's knowing of what was administrated for each group (blind study). In both groups anesthesia was performed with ketamine (10 mg/kg) and medetomidine (0,1 mg/kg) and maintenance of anesthesia was performed using isoflurane in oxygen. FLK was administered at a constant rate infusion (CRI) throughout the surgery and one hour after the surgery. All patients were monitored both intraoperatively and postoperatively every 5 minutes, respectively every hour. Physiological parameters were recorded (heart rate, respiratory rate, body temperature, glycemia, minimum alveolar concentration and the partial pressure of carbon dioxide at the end of an exhaled breath) and also postoperative behavioral changes (appetite, fecal output, grooming, posture). All these results were recorded in an adapted anesthesia monitoring sheet.
Results: Following the interpretation of the results of this study, small changes in the evolution of the physiological parameters for the two groups were observed. It is important to note that the variations in physiological parameters can also be influenced by the individual factor, being independent of the anesthetic protocol administered. CRI analgesia may be more useful in the case of long-term or postoperative interventions to avoid intraoperative boluses and give the substance time to reach a stable plasma concentration.
Conclusion: Therefore, this study concluded that the administration of FLK did not produce a sufficient analgesia during ovariohysterectomy, rescue analgesia being necessary. However, a higher degree of analgesia in the postoperative period was identified in the FLK group, but without statistical relevance.

Keywords: analgesia, buprenorphine, CRI, FLK, rabbit

EFFICACY OF FOUR ANTHELMINTIC MOLECULES ON DIGESTIVE NEMATODES OF SHEEP

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Introduction: Anthelmintic resistance is an increasing problem globally. There are only three classes of broad-spectrum antihelmintics used for sheep nematodes: benzimidazoles, imidazothiazoles and macrociclic lactones and multiple resistance is increasingly reported.
Aims: The aims of this study were testing the effectiveness of some anthelmintic synthetic molecules, from different classes, on sheep digestive nematodes and morphological identification of the digestive strongyles species before and after therapy.
Materials and Methods: The study was carried out in a herd from Cluj County, Roumania, 2022. Four molecules were tested: albendazole, levamisole, eprinomectin and doramectin. Faecal egg reduction test was performed. Before and after the therapy, faecal samples were collected and coproculture was performed for each group. After 7-10 days L3 were colected and identified using morphological and morphometrical keys.
Results: The population of digestive strongyles found in the herd under study showed resistance to all four molecules used; only the therapeutic combination consisting of levamisole and doramectin had efficacy > 95%. In the particular case of *Nematodirus* spp, efficacy > 95% was observed for levamisole, eprinomectin and the therapeutic combinations albendazole + doramectin and levamisole + doramectin. For *Strongyloides papillosus,* efficacy ≥ 95% was recorded following the administration of doramectin, eprinomectin and for the therapeutic combinations albendazole + doramectin and levamisole + doramectin. For each group, we identified 5-6 strongyle species/genus in the samples collected before the therapy. *Haemonchus contortus* was the most resistant species.
Conclusion: In the present research work, we have demonstrated that the problem of anthelmintic multiple resistance is very important and before using an anthelmintic molecule, resistance tests should be done.

Keywords: anthelmintic resistance, faecal egg reduction, sheep

CLINICALLY CONSIDERATIONS OF INDUCED EXPERIMENTAL PERIODONTITIS IN RATS TREATED BY PHOTODYNAMIC THERAPY

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Introduction: Periodontitis is a chronic inflammatory condition which affects the gums and the supporting tissues of the tooth in relation to the dental alveolus, creating a periodontal pocket which favors the adhesion of bacteria and can generate laxity and processes of resorption and bone demineralization. Thereby, the idea of this study is the induction of a local inflammatory response by induced periodontitis demonstrated by clinical and histological aspects and implementing a protocol of photodynamic therapy.
Aims: The aim of this study is to test an experimental protocol for inducing periodontitis which allows a close clinical evaluation of all its stages and also to test the effectiveness of a photodynamic therapy protocol in order to reverse and to improve the associated clinical and pathological symptoms.
Materials and Methods: 15 Wistar males rats were used for the induction of experimental periodontitis. In the first day tooth scaling and root planning of the first superior left molar were performed, causing the displacement of the gingival tissue in order to create an accumulation of plaque, then a 5-0 cotton ligature was placed, all this provoking an inflammatory response. After 10 days the ligatures were removed in all rats and the implemented protocol of photodynamic therapy was performed in one to three sessions for 10 rats and the other 5 rats represented the control group.
Results: The results obtained showed clinical aspects of periodontitis and also clinical aspects of healing and regenerating tissue, all being proved microscopically.
Conclusion: The tested procedure can provide all the key biological factors present in periodontal disease and also an option for reversing the clinical aspects.

Keywords: alveolar bone loss, chronic inflammation, periodontium, photodynamic therapy

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OUR APPROACH TO THE ABSENCE OF A TOOTH ON THE DENTAL ARCHES IN YOUNGSTER DOGS AND CATS- CASE REPORT SERIES

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Introduction: Dental eruption in cats and dogs ends by the age of seven moths[1, 2]. By that age, dogs should have 42 teeth, and cats 30. Any missing tooth from the dental arch should be radiologically investigated.
Aims: This case report series aims to analyze the concise diagnosis, and therapeutic solution depending on the distinctive situation of each case.
Materials and Methods: A missing tooth on the dental arch should be radiologically investigated. Seven cases with different therapeutical approaches are presented. From pure bred dogs, to mixed dogs treatment may vary from: no taking action, to removable dentures, dental bridges, dental implants, dentigerous cyst enucleation or surgical extraction.
Results: The oral cavity's normal physiology was restored regardless of the cause. An adequate therapeutical approach will lead to long-lasting, favorable results. Untreated retained teeth may lead to dentigerous cysts or oncologic complications.
Conclusion: It is recommended that every dog or cat seen for vaccination or neutering by the age of six months should have all the teeth identified and recorded. Any edentulous area needs to be radiologically examined [3]. Early diagnosis will lead to fewer complications and less invasive maxillo-facial procedures.

Keywords: cats, dentistry, dogs, teeth, retained.

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POSTER PRESENTATIONS

SESSION 1: AGRICULTURE

EFFECTS OF CHEMICAL FERTILIZATION, SEED TREATMENT AND TILLAGE SYSTEM ON WINTER WHEAT YIELD AND QUALITY

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Introduction: In the las years, minimum tillage system and no tillage system are promoted in order to protect soil from water erosion (Prosdocimi et al., 2016; Bogunovic et al. 2018) while positive effects on physical and chemical composition of soil are obtained (Castellini et al, 2019). Winter wheat is one of the most important crop in the world of particular economic importance, bread made from wheat flour being the essential food, also ensuring about 20% total calories consumed. Identifying a technology that ensures a superior quality, but also a high and stable production of the wheat crop by choosing: the right tillage system, the optimal level of fertilization and the treatment to combat diseases and pests is one of the priorities of agricultural research.
Aims: In order to evaluate the influence of chemical fertilization, seed treatment and tillage system on winter wheat yield and quality, a field experiment was conducted at Agricultural Research and Development Station in Turda (ARDS Turda), in 2020-2021.
Materials and Methods: The experiment was based on a split plot design, using plots of 16.8 m^2. The soil is characterized as clay-loam soil, with a lower fertility potential. Andrada winter wheat variety, obtained at ARDS Turda in 2014, was used for the experiment. The experimental factors were: tillage system (A) with four graduations, seed and foliar treatment (B) with three graduations and chemical fertilization (C) with three graduations.
Results: In the experimental variant with classical system and when basic fertilization plus two fertilizations during growing season were applied and also when seed treatment was practised and two foliar treatments were used, a high yield of 8163 kg/ha was obtained at Andrada winter wheat variety. Also, good yield results were observed when minimum tillage with disc or chisel were experimented. Regarding the protein content, it ranged at 2.4% with values between 9.43% and 11.83%.
Conclusion: Even if high yield was obtained when classical system was adopted, good winter wheat production was observed in minimum or no tillage system when high doses of fertilization were experimented.

Keywords: fertilization, protein, tillage system, winter wheat, yield.

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SOIL PROTECTION APP VS. SIMILAR DEDICATED APPLICATIONS

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Introduction: The current digital consumer society offers numerous applications dedicated to consuming entertainment, innovating, and research in the vast majority of fields of activity, including monitoring and soil protection practices.
Aims: For the present study we aimed to make an analysis of some of the existing applications in the online environment, whose use is intensely promoted among ecologists, pedologists, farmers, and researchers alike; the list we compare to our app includes apps like Soil Kit®, LandPKS®, Soil Samper®, Soil LogR®, and Soil Test Pro®.
Materials and Methods: Our research is based on the framework methodology for developing applications for mobile devices, in close compliance with the framework methodology for the development of agropegological studies, first published in 1987, with subsequent amendments and completions. The five previously mentioned applications and an application created by us using the MIT App Inventor® platform were used as material resources, and the working method was used to compare, step by step, the functionalities offered by the applications in question.
Results: As a result, a comparative study was obtained for the six applications, which cover both the basic functionalities (acquisition, saving and storage, data processing and transfer, etc) and the possibilities of use in relation to the various needs of users.
Conclusion: Through the present research, we have demonstrated that the application we created has real affinities for what soil protection means, being equally comparable to other applications used and tested in practice.

Keywords: mobile applications, soil protection, comparative study, functional testing.

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RESULTS OF THE RESEARCH ON THE INFLUENCE OF SOWING SEASON ON THE CHEMICAL COMPOSITION OF MAIZE GRAIN AT S.C.D.C.B. TG. MUREŞ

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Introduction: The early sowing of maize is a strategy that farmers can employ to potentially stabilize maize yields, not only in regards to changing climatic conditions, but also to avoid adverse conditions such as high temperatures and drought conditions during the grain filling period, phenomena that also occur in the Corn Belt of the USA (Lauer et al., 1999). The quality of corn production can be defined by the chemical composition and the physical, nutritional and technological properties of the plant and of the grains. These show great diversity, which gives corn multiple and varied uses (Sarca T., 2004).
Aims: The studies focused on the influence of the sowing season on the production and quality of corn grains in the area of influence of the Research and Development Station for Cattle Breeding Târgu Mureș. We found that, according to the data recorded in the 2018-2020 agricultural years, in the agropedological conditions of the Sângeorgiu de Mureș area, the studied hybrids responded well to early sowing, and the composition of the grains did not undergo substantial changes.
Materials and Methods: Between 2018-2020, three-factorial experiments were carried out, such as the subdivided parcel with 3 different sowing dates (early, optimal and late sowing) and 4 maize hybrids (2 hybrids with Romanian germplasm and 2 hybrids with American germplasm).
Results: By sowing the 4 hybrids at different germination temperatures, starting from 6° C in the soil at the sowing depth, we found that, in terms of the protein content of the grains, a distinctly significant positive difference was found only in the case of one hybrid, sown at higher temperatures (above 10°C). Regarding starch content, the difference was also significantly positive when sowing above the optimal temperature of 10°C, but in the case of another hybrid.
Conclusion: The results of the research demonstrate that the earlier sowing of corn did not significantly influence the starch and protein content of 3 of the 4 studied hybrids.

Keywords: maize, sowing time, quality

ANALYSIS OF THE PRODUCTIVITY OF SOME ROMANIAN POTATO VARIETIES IN THE AGROCLIMATIC CONTEXT OF THE BÂRSA COUNTRY

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Introduction: The potato is an economically important crop grown in about 150 countries and consumed almost daily by more than a billion people (FAO, 2018) and is a need to study the potential effects of associated abiotic stress on the yield and tuber quality of commercial potato cultivars (Siano et al., 2018).
Aims: twelve Romanian potato varieties were investigated for their growth parameters and yield to determine their suitability for production.
Materials and Methods: Experiments were conducted to NIRPSB Brasov in a randomised block design with four replications. Potatoes were planted manually on 6 April 2020 and 3 May 2021. Tubers were harvested on 20 September 2020 and 4 October 2021. Determination of the tuber number and their mass was done in each repetition. The potato yield was determined by measuring the tubers in each elementary plot and then the yield per hectare was calculated.
Results: Darilena produced the tallest plants (90.5 cm) and Castrum produced the shortest (58.88 cm). The number of stems per hill ranged from 2.5 (Foresta) and to 9.25 (Marvis). Tuber weight average per hill ranged from 2055 (Sarmis) to 500 g (Castrum).
Conclusion: Ervant (37.44 t/ha) and Azaria (37.94 t/ha) varieties records superior productivity and Asinaria and Darilena varieties showed adaptability to climate conditions and suitability for culture under high economic efficiency. Specific technologies must be established for each variety to reach the maximum potential and farmers must adapt to periods of stress that occur due to climatic variations.

Keywords: growth parameters, potato, tubers, varieties, yield

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EVALUATION OF THE RESISTANCE OF SOME WHEAT *Triticum aestivum* L. GENOTYPES TO EXTREME TEMPERATURES

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Introduction: Under changing climatic conditions, wheat seed production suffers a considerable decline due to the negative impact of factors such as drought, salinity and heat stress (Abhinandan et al., 2018). Therefore, one of the main objectives of scientists is to obtain tolerant varieties, which can express their production potential, including, in case of heat stress.
Aims: In this context, the aim of this study was to evaluate the potential of tolerance to extreme temperatures of some wheat varieties in the early stages of seed germination under laboratory conditions, using the heat shock.
Materials and Methods: Five varieties of winter wheat were used in the research. The seeds of the experimental variants (3 repetitions each) after soaking in water were subjected to a temperature shock of -7°C for 8 hours or +52°C for 30 minutes. The reaction was evaluated in comparison with the control. The ratio of the dry mass of the roots, the shoot, the seedling, the mass of the dry endosperm consumed for respiration processes and the one remaining unused from the endosperm of the seeds is calculated.
Results: Analysis of the effect of negative and positive temperature stress on seed germination and seedling growth showed a significant reduction in germination percentage, seedling growth parameters and biomass accumulation in all tested wheat varieties. The responses of the studied varieties to thermal shock differed. This made it possible to classify genotypes according to the degree of resistance to stress.
Conclusion: Exposure of seeds to a dose of heat stress led to an unequal response of the analyzed physiological parameters in the studied varieties. It can be concluded that the proposed method refers to express methods and can be used for winter wheat screening. The best performing varieties could be recommended for the breeding program and cultivation in areas with climatic conditions corresponding to their frost and heat resistance potential.

Keywords: physiological indices, thermal stress, wheat seeds (Triticum aestivum L.).

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IN VITRO MULTIPLICATION OF SOME PURPLE POTATO SPECIES

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Introduction: In the last decade, climate change has generated serious problems worldwide. It had a major impact on the environment, especially on agriculture and food security (Cramer et al., 2018). Due to the prolonged drought, countries such Germany, Austria, France, even Romania, began to pay attention to the excessive consumption of water, and even to rationalize its consumption in some areas and to prohibit the irrigation of agricultural crops. To satisfy the food needs of the population, and at the same time to rationally exploit the agricultural land, farmers began to introduce and cultivate into our country species from exotic areas (Mocan et al., 2017). For example, the culture of purple potato, original from South America (Lal et al., 2021), has recently been of great interest to Romanian farmers.
Aims: Develop a micropropagation protocol for different species of purple potato. In another hand, the aim is to follow the plant development depending on culture media and variety.
Materials and Methods: Sprouts of potato were sterilized and put on different type of culture media. The measurements were done after 3 weeks. The obtaining data was collected and processed by Polifact statistical program.
Results: The Murashige&Skoog media with regular vitamins supplemented by 15 mg/l glycine was the best.
Conclusion: In the present research work, we show the protocol of *in vitro* multiplication for some varieties of purple potato grown in our country. This protocol can be improved to obtain plant material.

Keywords: agriculture biotechnology, climate changes, purple potato

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ASPECTS OF BIOLOGY AND TECHNOLOGY REGARDING THE INTRODUCTION INTO CULTURE OF THE SPECIES *MALVA SYLVESTRYS* L.

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Introduction: *Malva sylvestris* is widely used in Mediterranean and European traditional medicine and ethnoveterinary for the treatment of external and internal inflammation, as well as injuries. Moreover, its use is not only limited to therapeutic purposes; but also the species is locally regarded as a food wild herb (Barros and Carvalho, 2010).
Aims: Taking into account the proven phytotherapeutic effects, *Mava sylvestris* L. can be used for inflammations of the respiratory system, gastrointestinal tract and for skin conditions. It was taken into account to introduce it into the culture, to deepen the necessary knowledge regarding aspects of biology and technology, as well as to obtain a raw material, rich in active principles, of superior quality.
Materials and Methods: The bifactorial experiment was laid out according to the subdivided plots design (3x3x3), having two factors in three repetitions; the length of one version was 2 m, and the paths were 1 m wide.
Results: Analyzing the influence of the interaction between factor A (distance between rows) and factor B (distance between plants per row) on the height of *Malva sylvestris* L. plants, no significant differences were noted in the three years of the study. Factor A, the distance between the rows, had a favorable effect on the average height of the plants, compared to the distance of 25 cm, taken as a control. The plants grown at greater distances between the rows registered significantly positive differences.
Conclusion: These studies create the premise of introducing the species *Malva sylvestris* L. into culture, with direct results on the production obtained.

Keywords: biology, cultivation*, Malva sylvestris,* technology

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THE RESISTANCE OF SUNFLOWER TO THE ATTACK OF SOME PATHOGENIC AGENTS IN THE CLIMATE CONDITIONS OF THE NORTHEAST BARAGAN

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Introduction. Due to its national economic importance, the sunflower crop has established itself as the main oleaginous crop cultivated in Romania. It faces several diseases that are difficult to fight chemically, the fungicide treatments being used only to control the spread of infection caused by the phytopathogenic fungi. Following long-term research, the creation of hybrids resistant to the attack of these pathogens has proven to be an effective, safe, and environmentally friendly solution.
Aim: The purpose of this paper is to examine the resistance of some biological sunflower creations created in Romania, to the attack of *Phomopsis helianthi* and *Phoma macdonaldi* mycoses, in the year 2021.
Material and Method: The experiment was placed in four repetitions, in field conditions with a natural infestation, at S.C.D.A. Brăila, in the 2020-2021 agricultural year. The used biological material was represented by nine new sunflower hybrids, tested to observe their behavior in different climate and soil conditions. Two problem pathogens were studied: *Diaporthe helianthi f.c. Phomopsis helianthi* and *Leptosphaeria lindquistii f.c. Phoma macdonaldi.*
Results: The climatic conditions of the 2020-2021 agricultural year were favorable for the growth of the pathogens. *Phoma macdonaldi* had an average attack frequency of 38.8% and an average attack intensity of 1.71%, while *Phomopsis helianthi* recorded average values of 67.8% and 3.08%, respectively.
Conclusion: Among the studied hybrids, the lowest attack degree of the *Phoma macdonaldi* pathogen was found in H3 (0.35%) and the highest in H1 (0.96%). Regarding the pathogen *Phomopsis helianthi*, the hybrid H3 showed good resistance, with an attack degree of 1.64%, and the hybrid H6 had low resistance (3.02%).

Keywords: diseases, Phoma macdonaldi, Phomopsis helianthi, resistance, sunflower.

WEED CONTROL STRATEGIES IN MEADOWS WITH REFERENCE TO THE SPECIES CIRSIUM VULGARE

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Introduction: Weed control in meadows is different from combating those in arable land, where usually only one species is protected (maize, wheat, sunflower, etc.) and the other competing species are combated. In the case of meadows, as a rule, one harmful species is combated, preserving as much as possible the rest of the forage species. Weeds reduce the growth and development of valuable grassland plants by competing for water, air, light and nutrients, and some even emit toxic substances. *Cirsium vulgare* (the milk thistle, spear thistle, or common thistle) is a species of the Asteraceae family, widespread throughout Europe, Western Asia and North-West Africa. It is also found in North America, Australia and is an invasive weed in some areas. The plant can reach a height of 1.5 m (but sometimes it can even exceed 2 m to 3 m). It is considered a shrubby plant. The biological form of the species is a biennial hemicryptophyte; they are plants with a biennial reproduction cycle by means of buds placed on the ground. In the first year they have a single rosette of leaves, while in the second year they bloom completely.
Aims: The aim of the paper is to present the development of strategies for controlling weeds in meadows with reference to the species *Cirsium vulgare*, through several methods such as: chemical, mechanical and agrotechnical methods.
Materials and Methods: The research was carried out during 2021-2022 in Plain Ierului, Satu Mare county, Romania. The experimental data include: determining the degree of weeding with *Cirsium vulgare* species using the metric frame, establishing the influence of herbicides on the species; for herbicide testing, 4 experimental variants were set up, the first variant being the control and the others applying 3 different herbicides; the study of the requirements of the species in relation to the vegetation factors and the performance of soil analyses.
Results: The obtained results show that through agrotechnical methods of correcting soil properties, a reduced number of plants per m^2 was obtained, and among the chemical methods used, herbicides based on 2.4D acid, dicamba and clopilarid were the most effective in combating invasive weeds such as *Cirsium vulgar*. The mechanical methods used gave a good result, but for a short period of time, the weeds regenerating almost completely after a certain period.
Conclusion: The most effective method of combating the species *Cirsium vulgare* is chemical control, followed by control by agrotechnical methods.

Keywords: weeds control, *Cirsium vulgare,* meadows

ECOLOGICAL AND EXPERIMENTAL PUBLIC SPACES OF THE FUTURE

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Introduction: Most of the ecological experiments conducted so far followed a similar pattern involving research sites fenced off from public view or with controlled visitation from the public (Pataki *et al*., 2021). Such an approach resulted in limited dissemination and replication of the research results, zero involvement of the citizen in the ecological design and no educational value of the experiment (Felson and Pickett, 2005).
Aims: Taking into account these considerations the aim of our study is to present a novel framework for co-designing urban landscapes polluted with heavy metals (HM).
Materials and Methods: The designed experiments are located inside the city of Baia Mare, Romania. The sites covering a total area of 7.3 hectares brownfields, are characterized by different levels of soil HM contamination. At the core of the urban design process stands an interdisciplinary approach which partners scientists from multiple fields related to life sciences (ecologists, agronomists, microbiologists, soil scientists) with urban designers, IT specialists, local municipalities and citizens.
Results: The revolutionary approach applied to the ecological and experimental public spaces from Baia Mare city consisted in an adaptive ecosystem creation which combined the phytoremediation process with future valorisation of the biomass produced (via a local environmental bonification system) and the educational value of the ecological experiment.
Conclusion: The co-design approach presented in this study represents a novel way for ecologists to restore urban environments polluted with HM and could stand as an innovative and sustainable framework for future design experiments.

Keywords: ecological experiments, designed experiments, phytoremediation, co-design, urban environments

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THE OPTIMIZATION OF THE MEDIUM NUTRIENT FOR THE *IN VITRO* PROPAGATION OF SOME SWEET POTATO VARIETIES

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Introduction: *Ipomoea batatas* [L.] is grown all over the world because it is an unpretentious species, has an economical technology, high yields per hectare and exceptional nutritional qualities. This species can be grown successfully *in vitro*, on Murashige-Skoog (1962) basal culture medium supplemented by different kind of phytohormones.
Aims: The sweet potato is considered a competitive vegetable product for the application of these *in vitro* techniques, which consist in the initiation of cultures using explants from shoots for rapid multiplication to obtain valuable genotypes because the vegetative propagation method leads to the degeneration of the planting material.
Materials and Methods: Different concentrations of BAP (1 mg/l), Kin (1 mg/l), IBA (1 mg/l), TDZ (1.5 mg/l) and active charcoal (0.5 g/l) were added in basal medium (MS) in combination with NAA (5 ml/l) and GA3 (1 ml/l), considered as control culture medium. To optimize the phytohormone concentrations, plantlets obtained from shoots of five sweet potato cultivars (CD/0, CD/1, CD/2, CD/3 and CD/5) were studied. The explants were inoculated on the culture media variants chosen for this study. After six weeks of incubation in the growth chamber, were determined the following parameters: height, number of leaves and root length of plantlets**.**
Results: For plantlets height, the best results were recorded on the control culture medium**.** Regarding the number of leaves, the best variant was the culture media supplemented by 0.5 g/l active charcoal. A maximum root length was observed on the variant supplemented by 0.1mg/l BAP.
Conclusion: The endogenous reserves of cytokinin from sweet potato are sufficient to develop the shoot elongation.

Keywords: sweet potato, tissue cultures, phytohormones

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THE BEHAVIOR OF SOME ALTERNATIVE CROPS UNDER THE SYNERGIC EFFECT OF SOIL WORK AND CLIMATE CONDITIONS IN THE EASTERN AREA OF ROMANIA

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Introduction: Water and thermal stress, accentuated in the last decade due to environmental pollution, hinder farmers from obtaining rich and balanced harvests in the quality-quantity ratio. Thus, it is studied to carry out minimal soil works and to cultivate a wide range of agricultural species that have increased adaptability to climate changes compared to agricultural plants often found on agricultural farms. Dry farming is one of those working systems that allow the exploration of several combinations of soil works and rarely cultivated plants that can replace conventional crops. Dry farming has a low impact on the environment - soil, water, air and can also contribute to obtaining productive harvests.
Aims: The present experiment was carried out to observe the influence of tillage on the yield of an alternative type of grassy cereals cultivated under water and thermal stress conditions in the eastern part of Romania.
Material and Methods: The experiment was located in the Experimental Field at the A.R.D.S., Braila, in the 2020-2022 agricultural years. In the study, rye and triticale crops, were sown in three repetitions on each tillage. The tillages were L1 – Plow (control), L2 – Paraplow, L3 – Scarified, L4 – Heavy Disc, and L5 – No Tillage.
Results: The 2020-2021 agricultural year was rich in precipitation compared to 2021-2022, characterized by pedological drought and atmospheric heat. Therefore in 2020-2021, the difference in yields, according to L2-L4 tillage compared to control tillage – L1, was between -540 kg/ha and +267 kg/ha for the rye crop and between 0 - 535 kg/ha for the triticale crop. In the second year of experience, the difference was between -562 kg/ha and +58 kg/ha for rye and between 0 - 484 kg/ha for triticale.
Conclusion: Climatic conditions influence production increases, especially the amount of precipitation, more evident in the triticale crop.

Keywords: dry-farming, productions, rye, triticale, water and thermal stress.

SESSION 2: ENVIRONMENTAL PROTECTION

ASSESSING CELERY NUTRITIONAL POTENTIAL USING HYDROPONIC ENVIRONMENTALLY FRIENDLY TECHNOLOGY

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Introduction: A way of enhancing nutritional capacity of vegetables is represented by the hydroponic technology of producing and maintaining the aimed cultivars. Up to date, not much research has been focused on hydroponic cultivation of celery, which is a valuable source of nutrients as raw material for nutraceutical products
Aims: The aim of our study is to estimate the crude chemical composition of genuine celery varieties, for assessing the nutritional potential of this vegetable to be used as raw material destined to be enhanced in nutrients by hydroponic culture.
Materials and Methods: The experiments were carried out in the greenhouse of the University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca. The biological material consisted of two native varieties of celery, Victoria and Dacia, from SCDL Buzău. The crude chemical composition was assessed according to Weende scheme.
Results: The following results were obtained in Dacia and Victoria celery varieties: a dry matter content of 20.41% and 21.22%, which corresponds to water contents of 79.59% and 78.78%. Regarding the nutrients content, the largest proportion is occupied by non-nitrogenous extractive substances (10.70%, and 11.10%) and the content in crude ash (6.20% and 6.24%). Crude protein (1.46% and 1.49) and crude fat (0.27% and 0.39) are the least represented nutritional components in celery roots of both varieties.
Conclusion: Determination of the crude nutrient content of celery Dacia and Victoria varieties grown hydroponically, emphasizes their nutritional potential to be used as raw material destined to be enhanced in nutrients by hydroponic culture.

Keywords: crude chemical composition, greenhouse, raw material, variety.

Acknowledgement. This article is funded by the Ministry of Research, Innovation and Digitalization through Operational Program for Competitiveness 2014 – 2020, Axe 1 - RDI in support of economic competitiveness and business development, Action 1.2.3. Section G - Partnerships for Knowledge Transfer, Contract no. 3/AXE 1/1.2.3.G/30.05.2018, ID: P_40_377, COD MySMIS <119675>. Title of the project: "Obtaining a food product, as supplement type on *Apium graveolens* L. substrate, nutritionally optimized by nutritional enhancement with selenium and vitamins, with the aim of improving life quality".

ANALYTICAL METHODS FOR THE DETERMINATION OF GLYPHOSATE IN WATER SAMPLES: A BRIEF REVEW

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Introduction: Glyphosate (Gly) is a polar nonselective herbicide which is widely used in agriculture, horticulture, silviculture and gardens. There is a clear need to develop simple, fast, efficient and sensitive analysis methods able to determine Gly in diverse environmental matrices, including water.
Aims: The aim of this review study is to provide an overview of the analytical methodologies used for Gly determination, including chromatographic and nonchromatographic techniques.
Materials and Methods: The most common and widely utilized technique for the determination of Gly in water are chromatographic methods, including HPLC-FLD, HPLC-DAD, HPLC tandem MS (MS/MS), GC-MS, IC-MS/MS, but also other methods such as ELISA, surface acoustic wave (SAW) and electrochemical sensors and biosensors.
Results: Determining Gly by chromatographic methods is difficile due to their chemical nature, which poses challenges in both sample preparation (extraction, preconcentration, derivatization, clean-up) and instrumental detection (poor column retention, low molecular weight MS/MS fragments, etc.) steps. Using HPLC-MS/MS for Gly analysis, the LODs or MRLs range from 0.001 to 400 µg/L. Taking into account the high demand for fast on-site measurements for Gly levels in water, developing miniaturized sensor for ultra-sensitive detection of Gly directly from water is required. Miniaturized devices can be fabricated as integrated portable sensors for Gly detection and they can act as electrochemical or surface acoustic wave sensors (SAW). To obtain highly sensitive sensors, several nanomaterials have been used to functionalize the sensing area of the miniaturized devices: multi-walled carbon nanotubes (MWCNTs) decorated with ZnO, gold ink, copper nanoparticles doped graphene with LODs ranged from 0.03-2 µM or molecularly imprinted polymers (MIP) with LOD ranged from 1-5 fg/mL (Congur, 2021).
Conclusions: It is essential to find the most appropriate method to determine the Gly content in water samples considering the particularities of this pesticide. The most common and widely used technique are chromatographic techniques, although often require derivatization to improve the sensitivity and selectivity. The MIP based sensors are the most sensitive and selective sensors for Gly detection. Furthermore, to increase more the sensitivity, a mass loading-SAW sensor using a MIP-chitosan substrate will be developed for Gly detection from water samples.

Keywords*:* chromatographic techniques, glyphosate, polar pesticides, sensors, water samples
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TESTING DRINKING SITE SPECIFIC WATER QUALITY

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Introduction: The water quality of streams, lakes and rivers depends on the sources that feed them. Unfortunately, water pollution is created when fertilizers, animal and human waste, plastics, and toxic industrial chemicals enter these sources. These situations entail economic costs through impacts on public health, fisheries, tourism and the environment. Governments try to control damage by setting water quality standards to regulate use.
Aims: The aim of this study is to emphasize the results of a study concerning site specific drinking water quality by quantifying some physico-chemical indicators: pH, total hardness, electric conductivity, nitrates, nitrites, ammonia, alkalinity.
Materials and Methods: The methodology of the study is in accordance with the national legislation and standards for drinking water quality, meaning the Law no. 458/2002 with supplementary articles and Law no. 311/2004, and particular standards. Th
Results: The results of the study emphasizes values as follows: 6.37 for pH, total hardness, 310 µS/cm for electric conductivity, 27 mg/L for nitrates, 0.008 mg/L for nitrites, 0.011 mg/L for ammonia, and 1.71 mL HCl 0.1N for alkalinity.
Conclusion: The results of our study reveals that the values quantified for the mentioned drinking water quality are within the limits foreseen by Romanian legislation, and in the meantime we have to emphasize that they are specific for the collecting area.

Keywords: indicators**,** legislation, quantification, standards.

METHODOLOGIES USED FOR PET VALORIZATION

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Introduction From the late 1990s to 2011, the amount of polyethylene terephthalate (PET) worldwide increased rapidly. Accordingly, equivalent quantities of PET waste are generated. Several methods of PET recycling are currently known. PET recycling methods can be classified into four categories: energy, carbonization, thermomechanical and chemical.
Aims: The purpose of this study is to synthesize and bring to light issues related to very complex and particularly important for the environment, regarding the possibilities of recycling polyethylene terephthalate (PET) waste.
Materials and Methods: For realizing the research presented in this study the methodology specific for reviews documentation was used.
Results: Energy recycling methods, such as incineration or pyrolysis, lead to a decrease in the PET cycle due to thermal degradation, using reaction products either directly or indirectly for energy recovery. Although carbonization leads to the production of coal, activated carbon or adsorbents for chemicals as greener applications. Thermomechanical recycling of PETs also leads to a "lower recycling" of PETs,. Chemical recycling methods, which ensure the complete depolymerization of PET monomers, are not currently a completely solved problem, because although they have the advantage of obtaining added value in the reuse of reaction products such as the synthesis of new PETs,
Conclusion: The presented study represents a synthetic update of the complex and particularly important issue related to the possibilities of PET recycling, with the emphasis on chemical methods, due to their diversity and importance.

Keywords: carbonization, chemistry, energy, thermomechanics.

SYNTHESIS AND CHARACTERIZATION OF NANOCOMPOSITES BASED ON CARBON NANOSTRUCTURES USED FOR DECONTAMINATION OF AQUEOUS SOLUTIONS

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Introduction: Multi-walled carbon nanotubes (MWCNT) became a very promising material in the field of agronomy, medicine, or depollution processes. They are very intensively studied by the scientific community, alone or in combination with other nanomaterials (Jian et al, 2010). Their properties can be improved by functionalising with Fe_3O_4, combining its mechanical, electrical, thermo-optical properties with the superparamagnetic behaviour of Fe_3O_4.
Aims: The synthesis and the characterization of new nanocomposites based on carbon nanostructures and metal nanoparticles and/or oxide nanoparticles of type MWCNT-COOH/Fe_3O_4 and MWCNT-COOH/Fe_3O_4/MO (MO = NiO or MnO) and the study of their properties as photocatalysts and adsorbents.
Materials and Methods: The nanocomposites were obtained in the laboratory. To establish the conditions for optimal retention of pollutants, the influence of some physico-chemical parameters on the adsorption process was evaluated, such as: initial pH of the pollutant solution, temperature, adsorbent dose, contact time and the initial concentration of pollutant. The photodegradation of pollutants was investigated under simulated sunlight irradiation.
Results: Here we report the synthesis and the characterization of new nanocomposites based on carbon nanostructures and metal nanoparticles and/or oxide nanoparticles and preliminary results on the adsorption and photodegradation capabilities of these nanomaterials for water depollution.
Conclusion: In the present research work, we demonstrated the enhanced photocatalytic and adsorption performance of MWCNT-COOH/Fe_3O_4 and MWCNT-COOH/Fe_3O_4/MO make them promising photocatalysts and adsorbents for wastewater treatment.

Keywords: Adsorption, Carbon nanotubes, Photodegradation, Pollutants, Water decontamination

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DETERMINATION OF SOME ANTIBIOTICS IN WASTEWATER LIKE AN EMERGENCE TARGET FOR SCIENTIFIC COMMUNITY

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Introduction: In the last decade a large amount of antibiotics was extensively and effectively used in clinics, agriculture, aquaculture and livestock. Antibiotics that were used by humans and animals might be excreted either as parent compounds or as bioactive metabolites in proportions of about 10%–90% of the used antibiotics, and thus could pollute the natural ecosystems (Zhang, 2003; Li, 2020). A global health emergency is represented by the antibiotic resistance, due to the various patterns of antibiotic consumption. Therefore, the major future needs should establish standardized method for quantification of the antibiotic residues and the level of antibiotic resistance, which are critical in establishing the link between their presence in the environment and their biological effects.
Aims: The study is focused on the analysis of the most present antibiotics in the wastewater of Romania. The main aims of the study are to develop an analytical HPLC-PDA-MS method to quantify antibiotics from wastewater and, to determine the antibiotic resistance profile of bacteria isolated from wastewater matrices.
Materials and Methods: By incubating the water samples with nutrient agar media, several bacteria were isolated and tested against the detected antibiotics. Several antibiotics were detected in the wastewater treatment plant by using the HPLC-PDA-MS technique.
Results: A part of antibiotics were also detected in effluent samples of the treatment plant after the treatment process. Several bacteria were isolated from the wastewaters and tested against these main antibiotics, all showing resistance to the almost all monitored antibiotics in the study.
Conclusion: After the water purification process in wastewater treatment plant, the antibiotic residues were still detected in effluent, which highlights the inefficiency of wastewater treatment process and a potential risk of waters contamination with negative impact on human and ecosystem health. The next step will be to try and determine the exact type of isolated bacteria and establish the mechanism of antibiotics resistance.

Keywords: Antibiotics, Antibiotic Resistance Profile, Wastewater.

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SESSION 3: FOOD SCIENCE AND TECHNOLOGY

VALORIFICATION OF *MEDICAGO SATIVA* L. IN OBTAINING AN INNOVATIVE PASTRY PRODUCT

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Introduction: Lucerne (*Medicago sativa* L.), also known as alfalfa has gained the researchers attention thanks to its rich chemical composition in bioactive compounds such as proteins, amino-acids, vitamins, minerals (mainly calcium and iron) or even phytochemical substances (Igual et al., 2021).
Aims: The present study aims to capitalize lucerne in the manufacturing of a new pastry product such as tart made from a tender dough.
Materials and Methods: The recipe for manufacturing the tart product included besides alfalfa powder the following raw materials: almond flour, oatmeal, agar-agar, vanilla milk, raw materials rich in fiber and nutrients. Three experimental variants of tarts were made with the addition of alfalfa powder in different percentages (P1-3%; P2-6%; P3-9%), as well as a control sample (PM- without the addition of alfalfa powder). The obtained products were analysed from their physicochemical (moisture, protein, ash, total phenols, antioxidant activity) and sensorial analysis point of view. Moreover, colorimetric test was made.
Results: Addition of alfafa powder had a positive influence mainly on the total phenols and antioxidant activity of the final products but also on total ash and lipid values. Sensorial analysis showed that addition of 6% of lucerne was considered optimal by panellists.
Conclusion: This study showed that lucerne powder could be successfully used for replacing almond flour in a new pastry manufacturing process, enhancing its nutritional values.

Keywords: antioxidant activity, lucerne, *Medicago sativa* L., sensorial analysis.

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VALORIFICATION OF CRICKET POWDER IN THE MUFFINS MANUFACTURING PROCESS

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Introduction: *Acheta domesticus* (house cricket) is one of the most nutritional promising sources due to its high content in protein, amino-acids, minerals, lipid, and fatty acids. Furthermore, is considered as a sustainable source, due to its less requirements for water, feed and land (Beldean et al., 2022).
Aims: The present study aims to capitalize *Acheta domesticus* insect flour in the manufacturing process of a new pastry product, such as muffins.
Materials and Methods: For muffins manufacturing, wheat flour was replaced with three different insect flour (IF) percentages, as follows: 5, 10, 15%, respectively. The rest of the added ingredients remained constant. Three experimental variants were obtained and submitted to physico-chemical and sensorial analysis. Protein, ash, moisture, lipid, were analysed by using AACC methods, whilst Folin Ciocalteu and DPPH assay were used for total phenols and antioxidant activity. Nine hedonic tests were used for the sensorial analysis.
Results: Addition of IF increased protein, ash, moisture, and lipid content of the final baked goods, mainly because of the IF rich chemical composition. Moreover, total phenols and antioxidant activity registered higher values with the increase addition of IF. The highest acceptability score was reached by muffins with 10% IF addition.
Conclusion: This study showed that IF could be successfully used for replacing wheat flour in muffins manufacturing process, enhancing its nutritional values. This research demonstrated that IF should be further exploited in other food product, enhancing their nutritional values.

Keywords: insect flour, protein, ash, lipid, muffins, sensorial analysis.

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RESEARCH ON OPTIMIZING THE MANUFACTURING TECHNOLOGY OF A GLUTEN-FREE BREAD WITH QUINOA FLOUR, SOY FLOUR AND CHIA SEEDS

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Introduction: Absence of gluten in bakery goods is a technological challenge, generating gluten-free breads with low functional and nutritional properties, but these issues can be minimized using new protein sources, by the addition of nutritional added-value products. Quinoa seeds have a high protein content, includes a well-balanced set of necessary amino acids, what makes them an unusually complete plant protein source for humans. Furthermore, quinoa is a great source of phosphorus and dietary fiber, minerals and vitamins.
Aims: The purpose of the present research was to develop a gluten-free bread supplemented with quinoa flour, soy flour and chia seeds to raise its nutritional quality and quality characteristics.
Materials and Methods: The quinoa flour (QF) was blended with rice flour at different levels: 5%, 10% and 15%, for gluten-free bread preparation. Also, 15% soy flour and 25% chia seeds were used to improve the quality characteristics of bread**.** Physicochemical analyses (weight, porosity, moisture, lipids, ash, protein and total carbohydrates) were determined according to Romanian Standard SR 91/2007, and the sensory analysis was made by using hedonic test.
Results: The addition of QF did not influence in a major way the weight of the breads, but the porosity decreased slightly. The chemical characteristics increased with the addition of QF to the composite flour. Also, soy flour led to a gluten-free bread with good quality characteristics, possibly due to the structural proteins and the enzymatic activities of the soybean flour, while the chia seeds contributed to binding the dough, in the absence of gluten. The sensory evaluation indicated that the gluten-free bread fortified with 10% QF had the highest acceptability score.
Conclusion: In the present research work, has been optimized the manufacturing gluten-free bread process with quinoa flour, soy flour and chia seeds and it was observed a strong relationship between these and the physico-chemical parameters.

Keywords: chia seeds, gluten-free bread, soy flour, quinoa flour, quality characteristics

VALORISATION OF ACACIA FLOWER FOR DEVELOPMENT OF FUNCTIONAL GLUTEN-FREE GINGERBREAD

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Introduction: The flowers of acacia (*Robinia pseudoacacia* L.) are mainly used in traditional medicine, but the researchers support the consumption of edible flowers of the acacia as functional food and their usage as sources of natural antioxidants in the food industry. The studies show that the flowers of acacia contain volatile compounds, phenolics, ascorbic acid, flavonoids (acacetin, secundiflorol, mucronulatol, isomucronulatol and isovestitol), proteins, robinin, polysaccharide and some microelements.
Aims: This study aims to exploit the potential of acacia flower powder to development a new type of gluten-free gingerbread with improved functionality.
Materials and Methods: The rice flour and almond flour was blended with corn starch resulting composite flour with following ratios 55:15:30. Comparatively, four experimental variants were analysed in which the corn starch was substituted in proportions of 3%, 6% and 9% with acacia flower powder (AFP), the rest of the ingredients being in the same concentrations in each experimental variant. The finished products were evaluated for total phenolic content (TPC) by Folin–Ciocalteu method, the content of flavonoids, by the spectrophotometric method and the radical scavenging activity (RSA) was determined by using the radical DPPH (2,2-diphenyl-1-picrylhydrazyl) scavenging capacity assay. Physicochemical analyses (moisture, lipids, ash, protein) were determined according to AACC methods and the sensory analysis was made by using hedonic test.
Results: The AFP addition has a positive influence on TPC, flavonoids and RSA of gingerbread. Also, it was recorded, that the addition 9% of AFP increased ash and protein content of gingerbread, and the sensory evaluation indicated that the gluten-free gingerbread fortified with 6% AFP had the highest acceptability score.
Conclusion: This study demonstrated that acacia flower powder is a viable functional ingredient in bakery goods to increase sensory and functional characteristics.

Keywords: antioxidant activity, flavonoids, flowers of acacia, polyphenols, sensory evaluation

SOLUBILITY INCREMENT OF ICARISIDE II WITH THE FORMATION OF COMPLEXES WITH WHEY PROTEIN

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Introduction: Icariside II (ICS) is one of the main active components of *Epimedii*, a traditional Chinese medicine. According to He *et al.* (2020) this was used to treat and prevent numerous health disorders, such as cardiovascular diseases, osteoporosis, or sexual dysfunction. Recently, several studies investigated their potential as drugs against many common health issues. Unfortunately, among various other factors, the low bioavailability of flavonoids remains a major obstacle to increasing their effectiveness. Its poor oral bioavailability is caused by low water solubility and membrane permeability, a slow dissolution rate in biological fluids, etc (Vazhappilly,2021).
Aims: Motivated by all those factors above, bioavailability improvement strategies for ICS are in high demand. Among many other methods the complex formation proved to have the highest efficiency. Thus, formation of those complexes with whey protein (WPC) can provoke an increased water solubility.
Materials and Methods: The Icariin II was purchased from Xi'an Day Natural Inc (China), and the whey protein mixture from Koliba Trade (Slovakia).
Results: The bonding between the ICS and the whey protein was successfully achieved. The characterization shows that the water solubility of icariside II increased. The greatest results at ICS 2:1 WPC mole rates were observed.
Conclusion: In the present research work, we demonstrated that this is an innovative method focusing on the water solubility improvement of the icariside II. The complex formation was successful.

Keywords: bioavailability, *icariside II, water solubility,* whey protein

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AMBERCAPS – SUCCINIC ACID-BASED MICROCAPSULES DESIGNED FOR FOOD AND PHARMACEUTICAL APPLICATIONS WITH HEALTH-RELATED BENEFITS

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The research topic is to formulate a succinic acid powder in different protective matrices, using the spray-drying technique. The powder thus formulated may be integrated into various foods and/or pharmaceuticals given the physicochemical characteristics of succinic acid, in particular the preservation and flavouring of the products in which it is integrated, and moreover due to the beneficial potential of the succinic acid on human health, especially on carbohydrate metabolism. Succinic acid is an organic compound with a wide applicability in various industries (e.g. intermediate in the synthesis of biodegradable materials, food additive excipient in pharmaceuticals, etc.). AmberCaps is proposing to obtain a new multifunctional ingredient formulated in the form of an extra-fine powder containing succinic acid, which can be easily used in the development of new foods and/or pharmaceuticals, with a beneficial impact on human health due to the controlled release at the intestinal level of the microencapsulated compound. The originality and innovation of this project is that succinic acid is formulated in the form of a functional powder making it available as such and not in the form of succinic derivatives, a product that can be easily integrated into various food matrices or pharmaceuticals dedicated to people with carbohydrate metabolism disorders, especially people suffering of type II diabetes or obesity.
Acknowledgment: This research was funded by the Ministry of Research and Innovation, CNCS-UEFISCDI, project PNIII-P1-1.1-PD-2019-0679 (SuccinYst).

Keywords: *bioactive powder, bio-polymeric capsule, microencapsulation, health, succinic acid.*

THE USE OF BACTILESS AND LONGEVITY TO REDUCE THE AMOUNT OF SULFUR DIOXIDE IN WINE

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Introduction: One of the products approved by the European Union, to reduce or replace SO_2 content and used in this study is Bactiless chitosan, a natural nonallergenic biopolymer used as a fining agent and antimicrobial in wines. Longevity, a specific inactivated yeast is also used to prevent wine oxidation.
Aims: The aim of this study is to evaluate the sulfur dioxide dynamic in two wines, dry white wine Fetească albă and dry red wine Fetească neagră produced in Târnave vineyard, to observe their evolution after use Bactiless and Longevity to reduce the amount of SO_2.
Materials and Methods: The study focused on the white and red dry wines from the 2020 harvest, Fetească albă and Fetească neagră produced using traditional winemaking techniques. The experimental variants were: Control, Longevity (20, 30, 40, 0 and 40 g/hL) with Bactiless (20, 35, 50, 50 and 0 g/hL). After ten days the following analyses were performed: free and total SO_2 (g/L), alcohol content (%), total acidity (g/L H_2SO_4), volatile acidity (g/L CH_3COOH), sugar (g/L), and total dry extract (g/L).
Results: All the analysed parameters were between the admitted limits. Specifically, for SO_2 the values were as follows: for Fetească albă wine, free SO_2 was reduced from 35 mg/L to 25 mg/L and total SO_2 from 122 mg/L to 117 mg/L by using 40 g/hL of Bactiless. Free SO_2 was reduced from 22,50 mg/L to 12,50 mg/L and total SO_2 from 85,00 mg/L to 77,50 mg/L by adding 20 g/hL of Longevity and 20 g/hL of Bactiless to Fetească neagră wine.
Conclusion: Results obtained for both Fetească albă and Fetească neagră wines show that sulfur dioxide levels are below the upper limit allowed by wine legislation, and lower than they had been before treatment. Also, all the wine analysed parameters were between the admitted limits. Although the wines under study had a low sulfur dioxide concentration, they still retained their varietal characteristics and organoleptic qualities.

Keywords: Bactiless, longevity, sulfur dioxide, wine

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EVALUATION OF STRUCTURAL BEHAVIOR WHEN REPLACING ANIMAL FAT WITH VEGETABLE OIL IN VIENNA SAUSAGES

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Introduction: Replacement of solid fats with liquid oils is accepted when the plastic properties of the fats are maintained in the product and to avoid the problems caused by the replacement of saturated fats, new methods for structuring oil are needed. Sausages are generally prepared from meat, including pork backfat as a fat source and may present some negative health concerns related to their high content of saturated fatty acids, which is typical for animal fat.
Aims: The aim of this study is to evaluate the structural behavior during the sausages obtaining process when animal fat was replaced with vegetable liquid oil.
Materials and Methods: Two experimental prototypes were produced: P1- Vienna sausages made with refined sunflower oil and P2- conventional Vienna sausages made with pork backfat. In order to establish the structural behavior, the meat batters were subjected to physical determinations (emulsion stability, textural and rheological analyses) and the sausages were analyzed both raw and prepared for consumption (boiling 10 minutes).
Results: In the case of the meat batter obtained with vegetable oil, the oil losses were reduced- 0.01%, but with the application of heat treatments they slightly increased: meat paste from raw sausages- 0.43% and meat paste from boiled sausages- 0.58%. For all samples, the results of the rheological analysis showed that no crossover points were observed, the storage modulus G′ was higher than loss modulus G″ and both moduli increased with increasing frequency.
Conclusion: In addition to satisfying the unsaturated fatty acid requirement, replacing animal fat with vegetable oil in meat products has the potential to create food products with desirable physical and sensory properties.

Keywords: Fat replacement, meat batter, structural behavior, sunflower oil.

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THE EFFECTS OF BITTER MELON (MOMORDICA CHARANTIA L.) POWDER AND STEVIA SWEETENER ON THE QUALITY CHARACTERISTICS OF KAPIA PEPPER PASTE

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Introduction: Bitter melon (*Momordica charantia L.*) has a lot of nutritional and functional properties scientifically proven (anti-diabetic and anti-dementia activity, anticancer and anti-oxidative properties, etc.), but due to its bitter taste, its usage among the population is limited.
Aims: This study aims to assess the quality of Kapia pepper paste obtained with added bitter melon powder of 1% in two experimental variants with different sweeteners.
Materials and Methods: Reformulation of 4 experimental variants of pepper paste was performed (V1-V4) by in-house methods based on varying following ingredients: kapia pepper (baked), sunflower oil, classic mustard, sugar (used for V1, V2) and natural stevia sweetener (used for V3, V4), 1% bitter melon powder (for each variant). AACC methods were used for the moisture, ash, protein, and lipids; pH (pH-meter) and soluble dry matter (ºBrix) were also performed. The total carbohydrate was calculated as the difference: 100 - (moisture + ash + proteins + lipids). Nutritional value (kcal) = Protein (g) x 4,1 (kcal/g) + Lipids (g) x 9,3 (kcal/g) + Carbohydrate (g) x 4,1 (kcal/g), was also performed by calculation. A 9-point hedonic scale was performed for sensory analysis (appearance, texture, taste, odour, flavour and overall acceptability).
Results: In terms of pH, all variants fall into the standards; the pH value recorded was between 4.47-4.49. The soluble solids content recorded value between 21.9/22,2°Brix (V3, V4)-25,2/25,4 (V1, V2) °Brix; the differences are due to the lack of sucrose in V3 and V4. The 1% bitter melon powder addition positively influences ash content; thus, the higher range of minerals and not significantly affect the protein and lipid content in all experimental variants.
Conclusion: The sensory analysis results and the quality attributes indicate that variant V4 of the product, paper paste with 1% bitter melon powder and stevia sweetener, has marketing potential.

Keywords: kapia pepper, bitter melon powder, stevia powder, paste

EVALUATING THE IMPACT OF THERMAL PROCESSING ON THE PROPERTIES AND BIOLOGICALLY ACTIVE COMPOUNDS OF SPREADABLE CREAMS DEVELOPED FROM BEECHNUT SEEDS

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Introduction: Beechnut seeds are already consumed despite the little scientific knowledge about their composition and safety. Beechnut seeds were roasted at different temperatures (125°C -145°C-165°C) for 35 minutes and used for developing spreadable creams.
Aim: Evaluate the impact of thermal processing on the rheological properties and oxidative state of the spreadable creams**.**
Materials and Methods: Roasting was performed in Memmert UF55 oven, then grinding in Retsch RM200 mortar. The fat was extracted using the Folch method. The fatty acids were analyzed by GC-MS. The volatile compounds release by in-tube extraction gas chromatography–mass spectrometry. The CIE Lab color parameters were also determined. Infrared spectroscopy was performed on Agilent Carry630. The viscosity was determined with Anthon Paar MCR 302 Rheometer, at 20°C by subjecting the sample to increased shear rate from 2 to 60 s^{-1}.
Results: Beechnut seed spreads were rich in oleic acid, linoleic acid and the eicosenoic acid. 1-pentanol, Hexanal and D-Limonene were determined during volatile compounds release. Sample roasted at 125°C exhibited a large round peak around 3000-4000 cm^{-1}, which was absent for the rest of the samples. Following the rheological analysis a pseudo-plastic behavior of the spreads was revealed. The spreads obtained at 145°C and 165°C exhibited lower values of the viscosity. The CIE Lab parameters decreased with increasing temperatures of roasting.
Conclusion: The 145°C thermal treatment is more suitable as processing parameter, the sample exhibited the desired rheology and appearance, but improved nutritional value.

Keywords: beechnut seeds, fatty acids, FTIR, rheology, volatile compounds
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SEASONAL MILK PARAMETERS IN NICHE DAIRY PRODUCTION – NĂSAL CHEESE CASE STUDY

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Introduction: Milk and dairy products are important elements of western diets. The composition of raw milk determines, to a considerable limit, the nutritious worth and the technological properties of milk and dairy products. Thus, the composition of milk is of great significance for dairy production (Fox *et al.*, 1998). Seasonal variation of milk within a yearly cycle is known to occur in Europe within various bovine breeds (Heck *et al*., 2009; Chen *et al*., 2014).
Aims: The research focuses on the seasonal variation of milk parameters relevant in niche dairy production in the Transylvania area of Romania, more precisely, the Năsal cheese variety produced by a local cooperative.
Materials and Methods: This qualitative approach analyses *in-situ* production relevant parameters of bovine milk, at the time of the production of each batch of the niche dairy product, the Năsal cheese variety.
Results: Low seasonal variation is present in the production relevant parameters of bovine milk, such as the minimum fat percentage and acidity, while density and minimum fat-free dry matter percentage show greater variations.
Conclusion: In the present research work, we highlight the seasonal variation of production relevant parameters of bovine milk within a yearly cycle.

Keywords: dairy production, milk parameters, Năsal

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PHYSICOCHEMICAL, TEXTURAL, AND SENSORY EVALUATION OF READY-TO-USE VEGETABLE PASTE BASED ON SUNFLOWER, BEECH, AND ACORN SEEDS

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Introduction: The vegetable-origin food products promote not only a healthy lifestyle, but are also destined for people whose religious guidance prohibits dairy consumption or meat, in certain periods or generally speaking (Christians, Hinduists, or Muslims).
In response to consumers' demand, functional foods, supplements, nutraceuticals, and alternative ingredients have been gradually brought to the market.
Aims: This study proposes the development and characterization of a new assortment of vegetable paste based on sunflower, beech, and acorn seeds. Four formulations of vegetable paste were obtained: VP_C–control formulation, $VP_{10\%SOAK}$–formulation with 10% sessile oak acorn kernel, $VP_{10\%BAK}$–formulation with 10% beech achene kernel, and $VP_{5\%SOAK+5\%BAK}$– formulation with 5% sessile oak acorn kernel and 5% beech achene kernel.
Materials and Methods: The formulations were evaluated for their physicochemical, textural, rheological, chromatic and sensory properties, respectively, energy value and storage stability.
Results: Spreadability is a key characteristic of the resulting red-yellowish vegetable pastes, especially when sessile oak acorn powder is adjusted into the mix. Panelists' responses highlighted three formulations with superior sensory properties: VP_C, $VP_{10\%BAK}$, and $VP_{5\%SOAK+5\%BAK}$. These products also represent a good source of carbohydrates, lipids, and proteins.
Conclusion: The spreadable vegetable paste made from conventional oilseeds and forest seeds is a promising alternative to meat products.

Keywords: beech kernel, manufacturing optimization, sessile oak kernel, spreadable vegetable paste, sunflower kernel

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COMPREHENSIVE OVERVIEW OF THE CONVENTIONAL AND NOVEL EXTRACTION METHODS APPLIED TO RELEASE THE BIOACTIVE COMPOUNDS FROM CEREAL WASTE AND BY-PRODUCTS

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Introduction: The cereal processing chain generates a huge amount of agricultural waste. It is estimated that around 12.9% of all food waste produced worldwide is from cereal processing. Plant sources must be processed efficiently, and environmentally friendly to obtain high-value bioactive compounds. The most crucial stage in isolating various types of bioactive molecules from cereals is the extraction process. Bioactive compounds have been extracted from cereal waste using both traditional and innovative extraction protocols.
Aims: This paper aims to comprehensively analyse both the conventional and novel extraction methods of cereal by-products.
Conclusion: Because of all the limitations of conventional extraction methods, intensive efforts have been made for the development of more efficient, sustainable, and ecologically friendly extraction technologies, such as enzyme-assisted extraction, microwave-assisted extraction, ultrasound-assisted extraction, membrane technology, subcritical and supercritical extraction, pressurized liquid extraction, steam explosion, pulsed electric field, and high voltage electrical discharge. Valuable bioactive compounds derived from natural sources are essential in the food, pharmaceutical, and cosmetics industries, and the appropriate techniques for extracting and isolating the targeted compounds from agro-food by-products require comprehensive research.

Keywords: cereal by-products, bioactive compounds, novel extraction techniques, conventional extraction, circular bioeconomy

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INFLUENCE OF SELECTED PULSES AND BUCKWHEAT ON QUALITY OF REFORMULATED "READY-TO-EAT" CREAM SOUPS

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Introduction: Commercial soup became popular after the invention of canning in the 19th century. Canned soup may be "ready-to-eat", meaning no other liquid is required to added before ingestion. Soups offer to innovate and develop new products (ingredients, tastes, processing, etc.).
Aims: This study aimed to assess the influence of selected pulses (chickpeas (*Cicer aretianum L.*), red-lentil (*Lens culinaris*)) and buckwheat (*Fagopyrum esculentum*) on sensory and physical-chemical characteristics of reformulated "ready-to-eat" cream soups.
Materials and Methods: Reformulation of 12 experimental variants was performed (V1-V12), based on varying following ingredients: lentil, chickpeas, oil, onion, pepper, buckwheat (in the form of whole seeds (V1-V6) and ground seeds (V7-V12)), tomato paste, tomato peel powder, oregano essential oil, sweet paprika, salt and water. Hot filling packing systems were used. A 9-point hedonic scale was performed for sensory analysis. AACC methods were used for the moisture, ash, protein, and lipids; pH (pH-meter) and soluble dry matter (ºBrix) were also performed. The carbohydrates were calculated by subtracting from 100 the values from moisture, protein, lipids and ash. Nutritional value (kcal) = Protein (g) x 4,1 (kcal/g) + Lipids (g) x 9,3 (kcal/g) + Carbohydrate (g) x 4,1 (kcal/g), was also performed by calculation.
Results: Based on the 9-point hedonic test, V1 and V11 were among the evaluator's preferences. The soluble dry matter content (°Brix) varies from 7.9 (V12) respectively to 8.4 (V1). The pH recorded similar values, from 4.55 to 4.71. The protein content increased from 6.2 % (V1) to 9.14 % (V11), directly proportional to the ash in the variants with added buckwheat (minerals source).
Conclusion: The results indicate that the chickpeas, red-lentil in combination with buckwheat (whole seeds added not grinded) represent the right combination of ingredients in the context of increasing the nutritional value of "ready-to-eat" cream soup.

Keywords: cream soup, canned, lentil, chickpea, buckwheat

PHYSICO-CHEMICAL EFFECTS OF POLYOL-PRODUCING MICROORGANISMS ON WHEAT-SOY FLOUR DOUGH MIXTURES

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Introduction: Traditional food upgrading helps to enhance the added nutritional advantages of foodstuff by adding several health-related effects. Wheat flour (WF), an indispensable basic food globally, contributes to daily fibre, energy, and micronutrient intake, but soybeans have a high content of soy-proteins and isoflavones. Therefore, bakery products enhanced with soy flour (SF) offer an attractive alternative to WF and improve dough quality.
Aims: The study aimed to use polyol-producing microorganisms, like *Oenococcus oeni* and *Saccharomyces cerevisiae*, in single or co-cultures and increase the dough's quality through frozen storage with SF.
Materials and Methods: The preparation of experiments comprised three types of WF-SF mixtures, and through fermentation, cell viability, pH, and the dough's viscoelastic property were also assessed. Additionally, through fermentation, extraction and quantification of organic acids and secondary metabolites were possible with the help of high-performance liquid chromatography.
Results: The addition of SF enriched the dough's rheological and physicochemical qualities, the growth dynamics of the microorganisms were increased, and the acidification decreased through 72 h of fermentation. Also, the carbohydrates decreased during sourdough fermentation, and an essential amount of organic acids were identified.
Conclusion: The addition of SF improved the dough's rheological and physicochemical qualities during fermentation. The present study is a valuable way of producing functional WF-based bakery products without substantial changes in their physical properties.

Keywords: dough, functional food, frozen storage, viscosity, wheat flour

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BIOACTIVE COMPOUND CONCENTRATIONS AND ANTIOXIDANT ACTIVITIES OF SOME BERRY LEAVES

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Introduction: Recent studies demonstrated that forest berry leaves contain an important concentration of bioactive compounds, similar to berry fruits (Ferlemi and Lamari, 2016).
Aims: This research aims to compare bioactive compound concentrations and antioxidant activities present in leaves of black mulberry (*Morus nigra*), black chokeberry (*Aronia melanocarpa*) and blackberry (*Rubus fruticosus*).
Materials and Methods: Leaves of the black mulberry, black chokeberry and blackberry manually picked were frozen for 24 hours at −30°C. The grounded leaf samples were mixed with distilled water or 60% ethanol for polyphenols and flavonoid extraction and with acetone for total chlorophyll and carotenoid extraction. Antioxidant activity and reducing power activity were tested.
Results: The highest polyphenol concentration was obtained using 60% ethanol for black chokeberry leaves, 201.6 mg gallic acid equivalent (GAE)/g dry weight. In contrast, the lowest polyphenol concentration was obtained from the blackberry leaves extracted with distilled water (34.8 mg GAE/g dry weight). Overall, the antioxidant activity and reducing power were higher for ethanolic extracts than for water extract leaves. Total chlorophyll and carotenoid concentrations were higher for black mulberry leaves.
Conclusion: The results indicate that black mulberry, black chokeberry and blackberry leaves contain bioactive compounds such as polyphenols, flavonoids, chlorophyll and carotenoid that exhibit antioxidant activity and reducing power activities. Extraction solvent significantly influences the concentration of bioactive compounds (total polyphenols, flavonoids), and antioxidant activity of berry leaves.
Acknowledgements: This work was supported by the Romanian UEFISCDI projects PN-III-P2-2.1-PTE-2021- 0508 and PN-III-P2-2.1-PED2021-2001.

Keywords: antioxidant activity, berry leaves, chlorophyll, polyphenols**.**

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EFFECT OF PARSNIP FERMENTED JUICE ON THE SHELF LIFE OF ROMANIAN BOEUF SALAD

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Introduction: Lately, ready-to-eat products tend to meet consumer demands because they are easy to use (some products do not need to be cooked), very tasty and available for many types of food, even traditional ones. But there is a very important debate about the shelf life of those products. Vegetable fermented juices may play an important role in providing food preservatives to extend the shelf life of those products. Romanian Boeuf salad, a popular recipe usually made during the holidays, is a combination of finely chopped beef, vegetables, and mayonnaise.
Aims: This study aimed to test a concentred parsnip fermented juice as a natural preservative source that induced shelf-life extension on Romanian boeuf salad.
Materials and Methods: Parsnip roots juice was sterilized, inoculated with *Staphylococcus carnosus* 10^7–10^8 CFU/mL, fermented at 37 °C for 24 h, centrifuged, and finally, natural preservative fermented juice was obtained. Concentred parsnip fermented juice was dispersed in Romanian boeuf salad. A treated Romanian boeuf salad sample was compared with the producer's recipe and untreated salad for 15 days. Investigation of bacteria associated with the spoilage of salad took into consideration total bacteria loads, *Lactobacillus fructivorans*, *Listeria monocitogenes*, and *Bacillus vulgatus*. TBARS were evaluated for lipid peroxidation levels.
Results: The results showed that concentred parsnip fermented juice decreased the oxidative process and exhibited an antimicrobial effect compared with the Romanian boeuf salad prepared by the producer.
Conclusions: Concentred parsnip fermented juice can be used to extend the shelf life of Romanian boeuf salad that uses mayonnaise in its composition.

Keywords: parsnip fermented juice, ready-to-eat products, TBARS, microbiologically contamination
Acknowledgements: This work was supported by the Romanian UEFISCDI projects PN-III-P2-2.1-PTE-2021- 0508 and PN-III-P2-2.1-PED2021-2001.

MICROCAPSULES FOR A LOCAL DELIVERY TARGETING THE DIABETIC RETINA

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Introduction: It is well known that diabetic retinopathy (DR) is a major cause of blindness worldwide. Due to high blood glucose and high pressure, the blood vessels that feed the retina can be altered by either leaking or eventually closing. As powerful antioxidants, anthocyanins can be used as antidiabetic molecules, but in a high pH environment, they lose some of these beneficial effects. Our aim for this study was to develop a system of AN able to target the retina
Materials and Methods: The extracted anthocyanins were purified using the solid phase extraction (SPE) technique and then were subjected to HPLC chromatography. The purified anthocyanins were microencapsulated. The synthesis of microcapsules was done by using layer-by-layer technique, their morphology and the mean size were examined by AFM microscopy and DLS. WST-1 viability assay was used to determine the viability of retinal pigment epithelial cell line D407 after microcapsules treatment. The intracellular localization of microcapsules was established by confocal laser scanning microscopy (CLSM).
Results: The encapsulation rate was estimate to be 94.6%. According to viability assays, neither free anthocyanins nor microcapsules are not cytotoxic for D407 cells. Confocal microscopy revealed that microcapsules were successfully internalized into D407 cells.
Conclusions: Current microcapsule design might be a promising tool one for a retina local delivery of anthocyanins or other therapeutic molecules.

Keywords: anthocyanins, D407 cells, diabetic retinopathy, microcapsules.

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NATURAL PIGMENTS, PHENOLIC COMPOSITION AND ANTIOXIDANT POTENTIAL IN "FLORNA'' APPLE CULTIVAR

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Introduction: Apples were the one of the most consumed fruits worldwide. The quality and nutritional potential of apple depends on the bioactive compounds, especially polyphenols.
Aims: The aim of the current study was to evaluate carotenoids, chlorophylls, phenolic compounds and antioxidant activities in the Florina apple fruits grown under different agricultural management systems.
Materials and Methods: Florina apple fruits were grown in conventional and organic orchards. The content of carotenoids, chlorophylls, total and individual polyphenolic content were determined. Antioxidant activity was evaluated using four assays (DPPH, ABTS, FRAP and CUPRAC).
The results: The content of total phenols obtained by the Folin Ciocalteu calorimetric method ranged from 216 to 480 mg GAE/100 g fresh weight, while total flavonoids ranged between 17–58 mg QE/100 g fresh weight. The highest values of carotenoids, total monomeric anthocyanins, total phenols, total flavonoids were were found in organically grown apples. Five phenolic acids and seven flavonoids were detected in the analysed samples. The amounts of catechin, epicatechin and ferulic acid dominated in organically grown apples, while vanilic and chlorogenic acids, as well as rutin, naringenin and myricetin were at the highest level in the conventional sward orchard. Antioxidant activity evaluated by DPPH, ABTS FRAP and CUPRAC methods were the highest in organically grown apples. A high correlation dependence was observed between total phenols and the DPPH and FRAP methods.
Conclusion: In the present research it was demonstrated that organically grown apples contained more phenolic compounds and possessed high antioxidant activity.

Keywords: antioxidants, apples, carotenoids, chlorophylls, polyphenolic acids
Acknowledgments: This work was supported/(partially supported) by the Bulgarian Ministry of Education and Science under the National Research Programme "Healthy Foods for a Strong Bio-Economy and Quality of Life" approved by DCM # 577 / 17.08.2018"

SESSION 4, 5 and HORTICULTURE, FORESTRY, ECONOMICS AND GEODESY

HELIANTHUS TUBEROSUS L., MAY BE THE ANSWER FOR CLIMATE CHANGE?

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Introduction: In a world of unpredictable weather, with more and more vulnerable species to abiotic and biotic stresses, we should reconsider taking a glance to species more resilient to climate change and biotic stresses. *Helianthus tuberosus* L. is considered a weed and an invasive species of the family Asteraceae, native from North America. But is also a plant with considerable strong stress resistance and nutritional value. Concerning the tuber consumption, it has many positive effects on health due to its anti-obesity, antifibrotic, antidiabetic and anti-inflammatory properties. The Jerusalem artichoke is tolerant to both high and low temperatures being adaptable to different growing conditions and cultivated in areas with various climate types, such as tropical, Mediterranean, and temperate monsoon (Liava et al., 2021).

Aims: The aim of the present study was to screen four genotypes bred at Vegetable Research and Development Station Buzau to biotic and abiotic stresses.

Materials and Methods: The research was conducted in the experimental site of VRDS Buzau and four genotypes of *Helianthus tuberosus* L. were taken into study for a period of two years (2020-2021). During the study it was evaluated their response to natural biotic and abiotic stresses. Also, the tubers quality was analysed in our laboratories.

Results: In the last two years Romania was affected by high temperature and low precipitation. The Jerusalem artichoke was grown on non-irrigated area and the crop production was dependent on rain-fed irrigation. It was noticed that the genotypes were resilient to drought and the yield wasn't compromised. The pest infestation was only seen on early spring when the rodents attacked the tubers, and during the vegetation period no insects have damaged the crops. Concerning infectious plant disease, it was noticed powdery mildew (*Podosphaera* sp.), on late summer and only one genotype of Jerusalem artichoke was vulnerable.

Conclusion: In our study, the Jerusalem artichoke showed once again that it should be taken into consideration as a climate change response species. Throughout to the quality of the tubers, Rareș variety registered the highest content of firmness (21.87 N) and the lowest total soluble solids content (12.00°Brix), while L4 variety present the highest content in dry matter (27.19%) and total soluble solids (20.66°Brix).

Keywords*:* abiotic stresses, biotic stresses breeding**,** Jerusalem artichoke,

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DESIGNING INNOVATIVE CROPS ACCORDING TO THE NEEDS OF CLIMATE CHANGE AND THE GREEN DEAL

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Introduction: Climate change and environmental degradation pose an actual threat to Europe and the rest of the world. In crop production, climate change requires adaptation to cultivation practices, infrastructure planning, and drawing up strategies for the proposal and development of adapted crops. This adaptation requires the detection of new innovative crops or a return to crops that were developed in the past but for various reasons, mainly due to economic effects or changing consumption conditions, were abandoned. The above-mentioned crops could be components of alternative redesigned agro-ecosystems, meeting the EU Green Deal targets for reduced use of chemical inputs by 2030.
Aims: The current study aimed to evaluate: a) the adaptation of production to the stormy effects of climate change, b) the detection of the receptivity of the producers to the application of the design of innovative and retro-innovative crops in the field, and c) the in-depth detection of inhibiting factors (natural resources, economic, social and anthropogenic factors) for producers.
Materials and Methods: A quantitative research was performed using structured interviews (face to face - a set of questions) and open-ended questions. The selected sample was composed of 41 farmers and the study area was the Mani Peninsula, Southern Greece.
Results: The statistical processing of the answers showed a significant correlation of change receptivity with age, educational level and the main profession. Younger people, those with higher education and non-mainstream farmers are more receptive to change and switch to innovative crops.
Conclusion: The environment, climatic and economic, requires adaptation and change in order to maintain sustainability. Producers are receptive to reforms and shifts to innovative and retro-innovative crops. However, there is a lack of coherent policies in the direction of building infrastructure, solving structural problems, training and transferring know-how, and finally, providing incentives and opportunities by creating and utilizing the appropriate tools.

Keywords: Climate change, innovative crops, retro-innovative crops, restrictive factors, sustainability

THE MORPHOMETRIC CHARACTERISTICS OF THE GURGHIU DRAINAGE BASIN

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Introduction: The morphometric parameters are in permanent interaction with the development and particularities of the torrential processes, including the basin relief, with the purpose of establishing solutions for the basin management (DÎRJA and COLIȘAR, 2010).
Aims: The characterisation and knowledge of the Gurghiu drainage basin represents a realistic analysis of the current state of the drainage basin. This analysis led to the obtaining of information on morphometric parameters specific to the drainage basin and the Orşova, Fâncel and Sirod sub-drainage basins.
Materials and Methods: Using the ArcG.I.S. application, the primary and secondary watershed divides were determined automatically and by means of functions; 16 sub-drainage basins with areas between 9,43 and 206,86 km2 were obtained. In order to analyse the potential of floods, we used the formula proposed by RĂDOANE (2006); for three sub-drainage basins, Fâncel, Orşova and Sirod, we determined the circularity coefficient, because an inventory of the torrent correction works was made in these basins.
Results: For the Fâncel sub-drainage basin, the circularity coefficient is 1.95, being far from the reference value and tending towards an elongated basin, due to geological diversity and different resistance to the erosion conditioned by the local base levels. By analysing the values of the Fervet runoff coefficient it is noticed that, for the largest surface of the basin, namely 293,4 km2 (44,8%), the value of the runoff coefficient is 0,4, meaning that, for the forest, the soil texture is clayey, clay-clayey and corresponds to a class of slopes of 10-30% and that for land usage, namely grassland, there is a slope between 5-10%, according to GAŞPAR (1978).
Conclusion: As a result, although the Gurghiu drainage basin tends towards an elongated shape, it has a torrential aspect, characterised by large slopes in the basin that contribute to the development of torrential phenomena.

Keywords: drainage basin, morphometric parameters, torrential

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VICIA FABA - PAST, PRESENT AND FUTURE BREEDING PRESPECTIVES IN ROMANIA

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Introduction: *Vicia faba* is one of the oldest vegetables in the world, recognized as a valuable protein-rich food and with high adaptability to grow in all climatic conditions, but despite this, in Romania is an underutilized crop, with few studies conducted so far. Previously, several investigations have been conducted to acquire data regarding the diversity of faba bean landraces in Romania (Pálfalvi, 1987; Stana-Ghizdavu, 1991; Vörösváry et al., 2011; Safira et al., 2013), but no one to patent a new breeding cultivar.
Aims: This study aims to explore past, present and future breeding perspectives on faba bean. It is worth mentioning that faba bean is a habitual crop in small gardens, but in the present, there are no cultivars of *Vicia faba* existent in the Official Catalogue of Crop Plants.
Materials and Methods: In this study, ten accessions of *Vicia faba* were grown in the Research Field of Vegetable Research Development Station (VRDS) Buzau, Romania. The accessions are allochthonous landraces collected from the (main) vegetable basin of Buzau/Romania.
Results: In our study, seven accessions belong to *V. faba* var. *major*, while the others fit to the minor group. The plant growth habit was semi-determinate for six accessions, while four had determinate habit. In terms of yield component, the accessions A1 and A7 had the highest yield.
Conclusion: The assessments concluded to a great variability between studied accessions and the results might be useful in the future breeding programs. Also, the most valuable accession will be proposed to be patented.

Keywords: faba bean, neglected species, phenotype

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LENTIL CROP ROTATION AND GREEN MANURING EFFECTS ON SOIL STRUCTURAL STABILITY AND CORN YIELD IN DIFFERENT SOILS IN CENTRAL GREECE

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Introduction: Grain legume production contributes widely to ecosystem services by its low reliance on synthetic fertilizers, reduced greenhouse gas emissions, increased diversification of the crop rotation and changes in soil fertility. Legumes have the potential to improve soil structure, increase soil organic carbon and reduce soil compaction (Reckling *et al*., 2016). Growing more grain legumes in future requires changes to the cropping system, the sequence, and the management of crops.
Aims: Taking into account the above, the objectives of this study were to examine the effects of various lentil cover cropping managements (viz. classic rotation and green manuring) on (i) soil structure and (ii) subsequent corn yield, in two different soil types commonly met in Greece.
Materials and Methods: Experiments were carried out on a clayey and on a sandy soil, following a RCB design, for two years. Three legume managements were tested before growing corn (rotation, incorporation as green manure, no cover crop). For assessing soil structure stability the instability index, β (Valmis *et al*., 1988) was used. Corm productivity was determined by field samplings.
Results: Both lentil management, had significant effect on the instability index β. Stability of soil aggregates was enhanced during spring and reduced during autumn, regardless of the lentil pre-treatment, confirming the seasonal variation of soil structure stability. Values of soil instability index β were smaller in the clay soil compared to the sandy soil, confirming the reliability of the index. Legume rotation and green manure positively affected corn kernel yield in both soils. The average increase was 1.3 t ha^{-1} for the sandy soil and 2.0 t ha^{-1} for the clay soil.
Conclusion: Results suggest that lentil rotation or green manuring has a positive effect on soil structure on both sandy and clay soils, by enhancing aggregates stability and porosity, respectively, leading to higher yields for subsequent corn crop.

Keywords: corn, lentil**,** rotation, soil stability

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A PRELIMINARY STEP TO LOOKING FOR A COMPLEX RESISTANCE AGAINST SCAB IN SOME APPLE ELITES BREEDED IN TRANSYLVANIA

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Introduction: Apples are firstly one of the most consumed fruits in the world and secondly one of the most important crops in temperate areas (Ferree and Warrington, 2003; Muneer el al., 2017). However, this species is affected by many diseases, including scab caused by *Venturia inaequalis*. Currently, scab is usually kept under control by the use of a variety of fungicides. Therefore, apple breeding programs aimed the obtaining resistant cultivars to this disease. A stable and durable protection against scab can be secured by cumulating the monogenic and polygenic resistance, thus to get a complex resistance.
Aims: Identification the presence of *Vf* gene in some elites breeded at Horticultural Research Station Cluj-Napoca, by using Marker Assisted Selection (MAS) assay as a preliminary step to establish possible occurring of a complex resistance (*Vf* + polygenic).
Materials and Methods: Three elites resulting from the combination of three genitors, one with polygenic type resistance (Generos used as female genitor) and two with monogenic type resistance (Florina and Priscilla used as male genitors), were the subject of the study. MAS was applied to detect the presence of *Vf* gene and, if the case, to distinguish homozygous to heterozygous genotypes. Three specific primer pairs were used, two dominant (AM19, $U1_{400}$), and another one codominant (AL07).
Results: Long-term growing in the field of the three apple elites under high natural inoculum pressure of *Venturia inaequalis* showed no symptoms of the scab both on leaves and fruits, so a field resistance was noted. Subsequently, MAS assay allowed the identification of *Vf* genotype as heterozygous (*Vfvf*) in all the three apple elites tested. Thus, monogenic *Vf* resistance as a first step of selection was recorded. Since one of the parents carry polygenic resistance trait, and *Vf* resistance may mask the previous in some conditions, we are also looking for capacity to express complex resistance in the three elites.
Keywords: apple, elites, scab, resistance, *Vf* gene

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RESEARCH ON THE GRAPE RIPENING PROCESS IN THE ODOBEȘTI VINEYARD AREA

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Introduction: The current global and zonal climate changes are also directly influencing the development of physiological and biochemical processes during grape ripening (Van Leeuwen et Darriet, 2016). The process of ripening the grapes begins with the entry of the grapes into the veraison and ends with the physiological maturation of the berries, when the seeds are able to germinate (Țârdea et Dejeu, 1994). The dynamics of grape ripening take into account the evolution of grain weight, sugar accumulation and reduction of acidity. The duration of the phenophase depends on the variety and the climatic conditions (Oprea, 2001).
Aims: This study presents the analysis of the process of growing and ripening grapes at four varieties of vines for white wines, created at R.D.S.V.V. Odobești, in the period 2020-2021.
Materials and Methods: The biological material was represented by four varieties of vines for white wines: ′Şarba′, ′Băbească gri′, ′Mioriţa′, and ′Vrancea′**.** In order to analyze the process of growing and maturing grapes, the following parameters were periodically determined: average mass of 100 berries (g), sugar content (g/l) and total acidity (g/l H_2SO_4). For the climatic characterization of the grape ripening period, were used the meteorological data recorded by the Adcon AgroExpert weather station of the R.D.S.V.V. Odobeşti.
Results: The highest percentage increase of the average mass of 100 grains index is registered in the ′Băbească gri′ variety (152%) and the lowest in the ′Șarba′ variety (117%). Analysis of the dynamics of the sugar content shows the largest percentage difference for the ′Băbească gri′ variety (232.5% compared to the initial content) and the smallest for the ′Vrancea′ variety (167.1% compared to the initial sugar content). The dynamics of the total acidity shows the largest percentage difference for the ′Miorița′ variety (37.7% of the initial acidity) and the smallest for the ′Vrancea′ variety (48.3% of the initial acidity).
Conclusion: The ripening period of the grapes was characterized by high air temperatures, poor rainfall regime, low values of atmospheric humidity and a very high night cooling index in 2020. The duration of the grape ripening process during the study period was shorter than the multiannual average, with small differences between varieties, which confirms the influence of recent climate change in the Odobești wine area.

Keywords: climate, Odobești vineyard, ripening process, vine varieties

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THE BEHAVIOUR OF SOME TABLE GRAPEVINE CULTIVARS IN RELATION TO *PHOMOPSIS VITICOLA (SACC.)* ATTACK IN TÂRNAVE VINEYARD

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Introduction: *Phomopsis viticola (Sacc)* causes excoriosis (Phomopsis cane and leaf spot), this results in high loses in grape production and in severe cases, death of the grapevine. The symptoms are as follows: the base of affected canes swells and blackens, and the scarred cortex may tear in longitudinal streaks, these canes are extremely fragile and easily break beneath their own load, other canes can completely dry.
Aims: This study was made in order to verify the presence and potential damage of *Phomopsis viticola (Sacc)* in a collection of table grapes cultivars located at SCDVV Blaj, both on leaf and cane symptoms.
Materials and Methods: Data was collected and calculated (*Phomopsis viticola* AD, attack degree on leaves and canes) for the years 2021 and 2022, from the following cultivars: Codreanca, Arkadia, Victoria, Muscat New York, Moldova, Original, Muscat Hamburg, Muscat Poeloeske, Timpuriu de Cluj, Splendid, Muscat bleu and Transilvania. Data comparison was done using the StatView software, ANOVA and ANCOVA test.
Results: Victoria was the most affected cultivar, data shows the highest AD on canes (20,3%) and leaves (21%) in 2021, respectively (19,8%) canes and (14%) leaves in 2022, significantly different from the rest of cultivars. Three cultivars had consistently low AD in both years: Muscat New York (0.5% canes, 0.2% leaves in 2021 and 0% canes, 0% leaves in 2022), Muscat Poeloeske (0.8% canes, 0.8% leaves in 2021 and 0.5% canes, 0.1% leaves in 2022,) and Moldova (0.5% canes, 0.1% leaves in 2021 and 0.6% canes, 2.6% leaves in 2022), this may suggest that resistance to *Phomopsis viticola (Sacc)* can be found in different cultivars. The AD of the other cultivars varied in function of the years (1,3% - 10% canes, 1,1% - 2.5% leaves in 2021, 0.8% - 6.5% canes, 0% - 4.5% leaves in 2021).
Conclusion: In the present research work, it was demonstrated that in Tîrnave vineyard different table grapes cultivars behave differently to *Phomopsis viticola (Sacc)* attack.

Keywords: attack degree, grapevine cultivar, *Phomopsis viticola (Sacc),* table grapes.

Acknowledgement: This research work was carried out with the support of Ministry of Agriculture and Rural Development, being financed from project ADER 7.5.3.

EVALUATION OF THE AGRICULTURAL AND QUALITATIVE POTENTIAL OF THE NEW AUBERGINE GENOTYPE RO19VER22 ACHIEVED AT THE BUZAU PLANT GENETIC RESOURCES BANK

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Introduction: The eggplant (*Solanum melongena* L.) is a fruit of major economic importance throughout the world, and is mainly grown in Asian subtropical regions (94% of world production), where its popularity has earned it the title of 'the king of vegetables' (Caruso et. all., 2017). Eggplant is a berry-producing vegetable belonging to the large family of Solanaceae, which has around 3000 different species distributed in across 90 genera (Kumar A., 2020). In Romania it was propagated by Greek and Bulgarian gardeners in the 18th century and it became wide-spread after the First World War . The most important growing areas of eggplant are located in the Southern, South-Eastern and South-Western part of Romania (Kovacs et. all., 2020).
Aims: Taking into account the increasing demands of farmers and consumers in terms of diversification of the assortment of aubergines marketed in Romanian markets, the Buzau Plant Genetic Resources Bank aims to contribute to its improvement by breeding and promoting new varieties, acclimatized to the growing conditions specific to our country.
Materials and Methods: From the germplasm plots, the stable genotypes that passed the general and specific combining capacity test were subjected to hybridization work resulting in a large number of hybrids, of which the L R10V22 x L O58V22 combination was of interest for the breeding program. From the hybrid combinations, it was found that in F1 a hybrid generation was achieved, uneven both in terms of the expressiveness of the main characters and in terms of the intensity of the heterosis phenomenon.
Results: As a result of the hybrid combinations, genotype A RO19VER22 was extracted, showing the following distinct and uniform fruit characteristics: fruit weight -590.35 g, fruit length -21.5 cm, obovate fruit shape, light green fruit color with slight striations, and greenish flesh, with an early ripening period.
Conclusion: In the present research work, we have succeeded in stabilizing a new eggplant variety, with distinct phenotypic expressiveness, to be patented and approved under the aegis of the Buzau Plant Genetic Resources Bank.
Keywords: core collection, morphotypes, Romanian, *Solanum melongena.*

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USE OF NUTRIENTS TO MODIFY THE METABOLIC EFFICIENCY OF GERMINATION AND GROWTH PROCESSES OF DIFFERENT HYBRID MAIZE SEEDLINGS

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Introduction: Maize (*Zea mays* L.), native to temperate and tropical regions, is a strategic crop with a large area of cultivation in the world and is widely used in the food industry, as animal feed, in various branches, including biofuel. During the ontogenesis of plants, the first phases of plant growth and development, including germination and seedling establishment, play a decisive role. In this regard, both the efficiency of the use of seed reserves and the availability of nutrients in the media that provide the nutrients and energy, necessary for germination and seedling growth, are of great importance. In addition, the effects of these factors are also determined by other factors, including the species and variety of crops.
Aims: The aim of the study was to study the physiological characteristics of the use of endosperm reserves and to assess the metabolic efficiency of seeds during germination and growth of seedlings, depending on the hybrid type of maize and pretreatment of seeds with nutrients.
Materials and Methods: The experiments were conducted using seeds of four maize hybrids, including Por. 180, Bemo 203, Por. 374 and Por. 427. Experiments were performed under laboratory-controlled conditions at 26°C, in the dark and air humidity of 60-75%. Before germination part of maize seeds were treated with H_2O (control) and other part (experimental) with nutrients of ½ Hoagland nutrient media. Seedling components, including roots, the aerial part (epicotyls) and the unused endosperm (seed remnant) were weighed and placed in an oven at 105°C ± 2°C for 72 h. The values of the dry mass of components were used to determine seed metabolic efficacy (SME) according to (Sikder et al., 2009).
Results: Seed treated with nutrients promoted the growth seedlings, increasing the biometrical indices, including height of epicotyls, radicle length, and accumulation of fresh biomass of plantlets. Also, seed treatment with nutrients significantly increased the rate of endosperm mass included in the formation of biomass of seedlings, while that consumed in respiration, on the contrary decreased, in comparison with the control. The data obtained indicate that utilization of nutrients for seed treatments before germination ensure utilization more efficiency of seed reserve substances released for maize seed germination and growth development of plantlets.
Conclusion: It has demonstrated that the metabolic efficiency of maize seeds (SME) in germination and seedling growth can be increased by pretreatment of maize seeds with ½ Hoagland nutrients media. And the SME level also depends on the type of maize hybrid.

Keywords: maize, hybrids, Hoagland nutrients media, seed metabolic efficiency

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STUDY OF GERMINATION AND GROWTH OF GOLDEN ROOT PLANTS ACCORDING TO ENVIRONMENTAL CONDITIONS

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Introduction: The golden root (*Rhodiola rosea* L.) is a valuable plant that grows in various regions of the world, including the Carpathians of Romania, Ukraine and Poland. The plant accumulates secondary metabolites in the rhizomes, which have antioxidant, biostimulatory and adaptogenic properties (Panossian, 2010, Karosanidze, 2022). In the literature, there is practically no information about *R. rosea* of Carpathian origin and very limited information about the problems of its cultivation in artificial conditions. For the research were collected seeds grown under artificial conditions and from the natural habitats of the Ukrainian Carpathians. The seeds were very small. The weight of one thousand artificially grown seeds was approximately 0,16g and those from natural conditions – 0,14g.
Aims: Our aim was to test and compare the percentage of seed germination and viability according to the conditions of the cultivation environment.
Materials and Methods: The seeds of *R. rosea* were collected at the end of august. To eliminate dormancy and increase the germination rate, the seeds were immersed for 24 hours in gibberellic acid solution (GA_3). Later, they were put to stratification. The stratification of the seeds was carried out according to the classic method by incubation on moist sand at +4ºC and darkness. After the expiration of the stratification period, on the 21st day, the germination rate of *R. rosea* seeds reached ≈ 95%.
Results: The mass of a seed obtained from plants grown under artificial conditions was on average 20% higher, but their viability percentage was about 50% lower compared to that characteristic for seeds collected from spontaneous plants in the Ukrainian Carpathians.
Conclusion: The seeds of *Rhodiola rosea* collected from artificial conditions were larger compared to those from the natural habitat, but their viability was much lower, practically 2 times.

Keywords: *Rhodiola rosea* L., seeds, stratification, Ukrainian Carpathians

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Acknowledgment: We present the data obtained partially within the frame of the project of the State Program 20.80009.7007.07, financed by the NARD.

FUNGAL PATHOGENS CAUSING GRAPEVINE TRUNK DISEASES IN ROMANIAN VINEYARDS

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Introduction: Over the last decade, increasing reports of damage caused by grapevine trunk diseases (GTDs) have raised concerns in all wine-producing countries. In order to correctly identify the disease, the causing pathogens also should be identified.
Aims: In this study, the fungal pathogens causing GTDs in Romanian vineyards were identified.
Materials and Methods: Samples of damaged wood tissue were collected from Tarnave, Aiud, Minis and Sarica Niculitel vineyards in the year 2020. Primary plate culture on agar-agar medium and selective medium Sabouraud, was done from all these samples. To isolate the fungi, the Petri dish culture method was used. An attempt to identify the fungal species was done by macroscopic and microscopic examination based on the morphological characteristics of the colonies: the type and color of mycelian hyphae, the shape, color and size of spores.
Results: The following fungal pathogens were identified: at SCDVV Blaj (Târnave and Aiud-Ciumbrud) vineyards, *Stereum hirsutum*, *Eutypa lata*, *Phomopsis viticola*, *Phaeomoniella chlamidospora*, *Diploida seriata*, *Phaeoacremonium sp.*, *Cadophora luteo-olivacea*, *Diatripaceae sp.*, *Fusarium oxysporum*, at SCDVV Bujoru (Bujoru vineyard) *Stereum hirsutum*, *Eutypa lata*, *Diploida seriata*, at SCDVV Murfatlar (Murfatlar vineyard) *Stereum hirsutum*, *Phaeoacremonium sp.*, *Diploida seriata*, *Botryosphaeria dothidea*, *Phaeomoniella chlamidospora* at SCDVV Miniș (Miniș vineyard) *Phaeomoniella chlamidospora*, *Diploida seriata*, *Phaeoacremonium sp.*, *Cadophora luteo-olivacea* and *Neofusicoccum parvum*.
Conclusion: Eleven fungal pathogens causing GTD in four Romanian vineyards were identified.

Keywords: fungal pathogens; grapevine trunk diseases (GTDs); Romanian vineyards

Acknowledgement: This research was funded by the Romanian Ministry of Agriculture and Rural Development, grant number ADER 7.5.3.

OBSERVATIONS ON THE EFFECTS OF THE HAIL ON SOME APPLE VARIETIES UNDER THE CONDITIONS OF 2021

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Abstract: The research was carried out in an apple plantation with varieties Jonathan, Golden Delicious, Starkrimson grafted on rootstock MM106 from the Falticeni Development Center of the Research Development Resort for Fruit Growing Iasi in 2021. During the agricultural year, it was observed as an extreme climatic phenomenon, hail, repeatedly recorded on 30 June when the trees were phenologically at BBCH 71-74, on 19 July at BBCH 75, 28 July at BBCH 77 and 24 August at BBCH 79, accompanied by heavy rains and storms that affected both the quality and quantity of fruit production.

Introduction: Hail is a form of solid precipitation consisting of transparent or opaque grains of ice, of various shapes, sizes and weight, which falls during rainfall, accompanied by orajous phenomena and strong wind, taking on the appearance of a storm.

Regarding the hail, Machidon O. mentions in 2009 in his thesis that studies of this phenomenon at the level of Romania, or the region of Moldova, were published in the works of the geographical Seminar "D. Cantemir' (Elena Erhan, 1986), in the collections of specialized works of the national meteorological Administration, (Bălescu, O.I., 1966), but also by a number of publishing houses in our country (Bogdan Octavia, 1978).

Materials and Methods: To calculate the degree of attack, field determinations were made on the fruit on the frequency and intensity of the degree of attack .

Results: In the first two drops of hail (30 June,19 July), the Golden Delicious variety recorded the percentage of 5% and 8,4% respectively of the attack degree being the most affected, followed by the Jonathan variety with 4% and 7% respectively, and the last Starkrimson variety with 2,8% and 6,5 respectively.

Conclusion: The highest degree of attack was recorded in the Golden Delicious variety in all four halves, with a percentage ranging from 5% in the first half (30 June) to 67% on August 24.

Keywords: apple,climate accidents, hail.

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PRELIMINARY RESULTS REGARDING THE BEHAVIOUR OF TWO CHOKEBERRY (*ARONIA MELANOCARPA*) CULTIVARS IN ENVIROMENTAL CONDITIONS OF NORTHERN TRANSYLVANIA

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Introduction: Chokeberry (*Aronia melanocarpa* Michx.) Elliott is a versatile decidious shrub, belonging to *Rosaceae* family, that could be cultivated on a wide range of soil types, in different climatic conditions (temperature, rainfall, humidity) and geographic areas. Originally from North America and Canada, chokeberry is one of the most important small fruiting shrubs in terms of containing the highest antioxidant, polyphenols, antocyanins and vitamines content among many shrub species.
Aims: The aim of this research article is to reveal the behaviour of two chokeberry cultivars 'Nero' and 'Melrom' regarding vegetative bush growth and yielding process, corelated with phenology and climate conditions at Fruit Research and Development Station Bistrita, in Northern Transylvania.
Materials and methods: The biological material was represented by two chokeberry cultivars, 'Nero' and 'Melrom', planted in 2020 at Fruit Research and Development Station Bistrita, planting dinstances of 1.5 x 4 m (1667 plants/ha) cultivated in three replications with 7 plants per replication. For pests and disease control we folowed the plan for organic and conventional treatments. The phenological phases were calculated using BBCH scale (Biologische, Bundessortenamt and Chemische Industrie). No pruning was applied to the chokeberry bushes.
Results: Phenological observations showed that chokeberry inflorescence buds stages (BBCH 51- 54) occurred between 01 of March and 23 of March, flowering stages (BBCH 60- 71) were between 30 of April and 14 of May and fruiting stages occurred (BBCH 72- 87) in June and July. Bush volume registred values ranged between 0.40 m^3 and 0.84 m^3 at 'Nero' cultivar and between 0.47 m^3 and 0.75 m^3 at 'Melrom' cultivar, with 5 -12 annual bunches and yield/ bush between 0.320 kg- 1.270kg to both cultivars.
Conclusions: The preliminary results of this study revealed that chokeberry cultivars found good conditions for growth and development in Northern Transylvania in the studied research period. Chokeberry is a shrub species that does not require many phytosanitary treatments, thus the ecological cultivation is a premise for the future.

Keywords: chokeberry, cultivars, pests, growth, yield

THE INFLUENCE OF CLIMATIC CONDITIONS ON DOWNY MILDEW AND POWDERY MILDEW IN TÂRNAVE VINEYARD

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Introduction: Grapevine downy mildew caused by *Plasmopara viticola* (Berk. & M. A. Curtis; Berl. & De Toni) and grapevine powdery mildew caused by *Uncinula necator* (Schwein.) are the main diseases affecting the vineyards in the Târnave vineyard. Climatic conditions are the main factor in the onset, development and evolution of these diseases.
Aims: To study the influence of climatic conditions on the attack degree (AD) of downy and powdery mildew on grapevine cultivars.
Materials and Methods: The study took place during 2021-2022, in the vineyards of SCDVV Blaj, on the cultivars: Selena, Blasius, Rubin, Radames and Brumăriu. To determine the AD, several series of observations (different BBCHs) were carried out, assessing the frequency and intensity of the attack, based on which, AD was calculated. Climatic data were processed and correlated with the development phases of the vine and the pathogens *Plasmopara viticola* and *Uncinula necator*.
Results: In the year 2021, the average annual temperature of 11.5^{o}C and an amount of precipitation of 788 mm were recorded, favoring both downy and powdery mildew. For downy mildew, the highest AD was recorded in the Blasius cultivar with 4.90% for leaves and 1.10% for grapes. For powdery mildew, the highest AD was for Selena cultivar, with an AD of 4.10% for leaves and 0.90% for grapes. The lowest AD for downy mildew (1.40% for leaves and 0.50 for grapes) and powdery mildew (0.01% leaves and grapes) in 2021 was recorded for Radames cultivar. In the period January - July 2022, the average monthly temperatures were slightly higher than the multiannual average, and the precipitation regime lower than the multiannual with an accentuated deficit. For downy mildew, no AD was registered and powdery mildew was registered only for Blasius cultivar on grapes (AD – 0.01%).
Conclusion: Against the background of these climatic elements, downy and powdery mildew behaved differently, depending on the climatic specifics of the year and the cultivar.

Keywords: climatic conditions, grapevine, downy mildew, powdery mildew

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SEDUM CUTTINGS ROOT GROWTH ANALYSIS USING DIFFERENT TYPES OF CULTURE SUBSTRATES

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Introduction: Succulent plants are known for their resilience, vigor, and plasticity, as they can easily adapt to pedo-climatic conditions an urban or natural setting might bring. These plants are drought tolerant because of their distinct metabolism and are consequently widely used in both vertical garden and green roof systems.
For the most part, *Sedum* plants can grow in any type of substrate, moreover, they prefer soils lacking in nutrients and grow very well in light and well-drained soils.
But how easy are they to propagate? To find out, the current paper presents a case study analysis of the behavior of 3 *Sedum* varieties and their root development using 3 different types of substrates.
Aims: The purpose of this study was to assess the root system growth rate of *Sedum* species under hydric and saline stress.
Materials and Methods: 3 types of growth media were chosen, one specific to green roofs (grp. A), a commercial garden soil (grp. B) and sand (grp. C).
The substrates were divided equally in 2046 pots in which 12.276 cuttings were planted, 6/pot.
• 581 pots, 3486 cuttings of *Sedum spathulifolium* 'Purpureum';
• 482 pots, 2892 cuttings of *Sedum spurium* 'Purpur Winter';
• 983 pots, 5898 cuttings of *Sedum spathulifolium* 'Cape Blanco'.
Without subsequent fertilization or irrigation, during a 20-month period, the realization of this study involved approaches to measure the root development and in what way, external factors such as soil temperature and relative humidity can influence the rate in which this process happens. In order to measure the substrate relative humidity and temperature, soil probes were used once every 7 days.
Results: Grp. A yielded the best results with an average of 15.43 cm, grp. B was the second best, with an avg. of 14.18 cm and grp. C with an average of 11.71 cm was on last place.
Conclusion: Comparing the data between groups, under conditions of hydric and saline stress, group A is more suitable for this type of propagation – between species, the root system development was more uniform and the average root development was 8.10% greater than that in the group B and 24.11% greater than in group C.

Keywords: Sedum, root development, saline stress, hydric stress

ROMANIAN TRADITIONAL MOTIFS IN LANDSCAPE DESIGN

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Introduction: The current paper presents a case study analysis of a landscape design that uses two philosophies that by definition are in antithesis, "Tradition and Modernity". *Sedum* species were used in mosaics representing probably the most wide-spread decorative elements our country has to offer, traditional motifs and patterns. These simple yet captivating geometric shapes are the foundation of our visual vocabulary, the starting point of every other shape that we, as creators and artists, can imagine. Well-defined and balanced shapes like circles, squares and rectangles will be, in the human mind and psychology, much more attractive than other asymmetrical shapes. People will strive to find harmony in their daily lives, seeking balance and stability in what they can control and influence. The study was carried out in Cluj-Napoca on the campus of the UASVM Cluj-Napoca, more precisely on the southern terrace of the Advanced Horticultural Research Institute of Transylvania.
Aims: The present research aimed to find an arrangement solution using traditional Romanian patterns and to analyze growth behavior of 3 *Sedum* species in different substrates under saline and hydric stress.
Materials and Methods: On the south facing terrace of the Advanced Horticultural Research Institute of Transylvania, a total of 12.276 *Sedum* cuttings were planted (6/pot) and 3 types of growth media were chosen, one specific to green roofs (grp. A), a commercial garden soil (grp. B) and sand (grp. C). The design involved building a simplified extensive roof garden (40 m²). For this, 9 structures had to be built, 3 raised beds as plant nurseries and 6 metal structures made of welded mesh. The 3 chosen *Sedum* varieties were chromatically different, representing the 3 main colors in Romanian traditional patterns, red, white and black.
Results: After a 20-month period, although 57% of the studied plants survived, only 258 pots out of 2046 remained empty and the main mosaic design could still be recognized.
Conclusion: Given the fact that this study was mainly aimed towards the growth analysis of *Sedum* plants under saline and hydric stress, the mosaic could not last very long. Nonetheless, this study proves that these *Sedum* varieties will tolerate and survive even in the harshest environments and with little interventions regarding nutrient administration and irrigation, these plants will thrive in any type of growth media.

Keywords: Sedum, mosaic, pattern, saline stress, hydric stress

PATENTABLE FORMULA BASED ON ESSENTIAL OILS WITH A PROTECTIVE EFFECT AGAINST *RHIZOBIUM VITIS*

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Introduction: The crown gall of grapevine is an economic importance bacteriosis, being caused by *Rhizobium vitis* strains. Bacterial diseases prophylaxis based on cupric compounds or antibiotics is not effective enough therefore, the current trend is towards use of antimicrobial microorganisms or biopesticides, non-toxic and non-polluting. The use of plant essential oils with potential to control phytopathogens including bacteria like *Rhizobium vitis*, would be a promising and ecological alternative for agriculture.
Aim: The goal of this study was to assess antibacterial activity of essential oils against *Rhizobium vitis*, by *in vitro* and *in planta* tests.
Materials and Methods: Five essential oils (EO's) were tested against to the 2btm strain of *R. vitis* for their capacity to inhibit the phytopathogen growth. The measurements regarding *in vitro* inhibition zone were performed. Subsequently, the ability of patentable formula based on essential oils to prevent/reduce tumors formation in tomato and vine plants has been tested. After 30 days for tomato plants, the evaluation of disease incidence and effectiveness of treatments applied at two points in time (T_0 and T_{30}) were determined. In vine plants, tumorigenesis is initiated up to 9 months after inoculation, so the results are being processed.
Results: Efficacy values of 93.75% at both T_0 and T_{30} and a very low disease incidence of 6.25% compared to positive control were recorded. Also, the tumors of EO's treated tomato plants were smaller in size and did not form a complete ring as positive control plants.
Conclusion: The use of patentable formula as prevented treatment, reduced the number of plants developing crown gall symptoms and tumor size compared to positive control plants.

Keywords: crown gall, essential oils, *Rhizobium vitis*

Acknowledgement: This study was carried out in the frame of ADER 7.3.8 project 2019-2022: "Research on systemic diseases, phytoplasmoses and crown gall in grapevines, in order to increase the economic efficiency of wine farms", financed by the Ministry of Agriculture and Rural Development - MADR.

CURRENT DISTRIBUTION AND ATTACK INTENSITY OF *TUTA ABSOLUTA*(MEYRICH,1917) ON TOMATO UNDER GREENHOUSE CONDITIONS FROM SOUTH AND CENTRAL ROMANIA

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Introduction: *Tuta absoluta* is already considered the most devastating pest of tomato crops in southern Romania while no data were available about the presence of the pest on the area from the central part of the country. *T. absoluta* monitoring is a vital step in early detection as well as for the management decision-making.
Aims: The aims of the study were to elucidate the interval of occurrence, population dynamics of *T. absoluta* adults, and the level of damages induced by larval populations in two contrasting tomato-producing areas of the country and to analyze the factors influencing pest population trends as a base for the pest integrated management planning.
Materials and Methods: The study was performed in 2020-2021, in twenty greenhouses, half of them located in southern Romania and half in central area of the country. To monitor the adult's activity, sex pheromones lures AtraTut-S coupled with white Delta traps were used. Weekly observation and counting the number of larval mines on tomato leaves during vegetation period and on the tomato fruit at harvest were performed.
Results: In the southern Romania, the tomato leaf miner completed 3 to 4 generations from spring to autumn and the degree of attack on tomatoes reached its maximum at the end of the second vegetation cycle. The survey revealed the presence of the pest in central Romania, a low incidence of catches, both years of experimentation, but no symptoms of attack were found on tomato plants in analyzed greenhouses or adjacent area.
Conclusion: *Tuta absoluta* attack has intensified in southern Romania while in central part of country the presence of pest is rather accidental, the infestation is recent so more research are needed in order to establish the influence of climate and other factors that can limit the pest invasiveness potential in the region.

Keywords: greenhouse tomatoes, monitoring, *Tuta absoluta*

IMPACT OF SEWAGE SLUDGE FERTILISATION ON EARTHWORM COMMUNITIES IN SWEET CHERRY ORCHARD

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Introduction: The application of sewage sludge as fertilizers in orchards may have undesirable environmental effects due to its content of heavy metals. The classical measurements of the total content of heavy metals in the soil, used on a large scale as a criterion for soil pollution, are expensive and do not provide indications regarding the transfer of toxic elements in the food chain. A series of recent works propose the use of bioindicator species as a feasible alternative to evaluate the effects of heavy metals in the environment.
Aims: Earthworms represent one of the most important groups that can be used as bioindicators of soil health in agro-ecosystems. The aim of the study was to use the earthworm communities as bioindicators to evaluate the impact of sewage sludge application on sweet cherry orchards.
Materials and Methods: The effects of sewage sludge on earthworm communities were investigated in sweet cherry orchard, on Skeena variety, at R.I.F.G. Pitesti during 2020-2021 seasons of vegetation. We examined abundance, species diversity and the ratio of adult-to-juvenile earthworms, in 5 experimental treatments: 4 sewage sludge application rates of 20, 40, 60 and 80 tons per hectare and untreated check. Also, some physical-chemical soil characteristics (pH; OM content; N, P, K content), as well as heavy metal concentrations have been measured.
Results: The diversity of earthworm species identified in the study was represented by 8 species belonging to the Lumbricidae family, respectively: *Aporrectodea caliginosa, A. chlorotica, A. longa, Allolobophora chlorotica, Octolasion lacteum, Lumbricus terrestis, L. castaneus* and *L. rubellus*. The greatest diversity and abundance were recorded in the treatment with the application of the dose of 40 tons sewage sludge per hectare, above this limit the values significantly decreased.
Conclusion: In the present research work, we demonstrated the usefulness of earthworm communities as bioindicators to evaluate the impact of sewage sludge as fertilizer in orchards.

Keywords: Bioindicators, Earthworm abundance, Earthworm diversity, sewage sludge

ALTERATION OF THE ENZYMATIC ACTIVITY OF THE RHIZOSPHERE OF TRADITIONAL PEPPERS UNDER LOW-IMPUT CONDITIONS

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Introduction: Soil is inhabited by a great variability of microorganisms, responsible for the transformation of organic and inorganic products to other elements that are available to plants. These microorganisms represent an enzymatic source whose detection can be used as a useful method to assess the biological activity and the biodiversity of the soil.
Aims: There is a need to identify and develop sweet pepper varieties better adapted to low-input conditions and with an interesting interaction with the soil microorganisms. Thus, the alkaline phosphatase (APase) and catalase (CAT) enzyme activities from the rhizosphere of three sweet pepper landraces under reduced fertilisation and/or irrigation management were determined.
Materials and Methods: Piquillo, Najerano and BGV-13004 varieties were grown under four treatments. Soil samples were taken from soil in contact with roots. APase was determined according to Tabatabai & Bremner, (1969), and CAT was obtained using a protocol based on Johnson & Temple, (1964).
Results: Piquillo seemed to be the variety that best favoured the APase activity since its levels in the rhizosphere were similar among the treatments, regardless of the fertiliser and water doses. In the case of CAT activity, BGV-13004 showed higher levels under water stress compared to the well-watered treatments.
Conclusion: APase activity was certainly favoured by Piquillo under low-input conditions, while BGV-13004 especially favoured CAT activity under drought. These differences indicate the potential to select varieties with better interactions with soil microorganisms under low input conditions.

Keywords: alkaline phosphatase, catalase, low-input conditions, rhizosphere.
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EVALUATION OF HYBRIDS OBTAINED FROM SPANISH LANDRACES OF CAPSICUM ANNUUM L. UNDER ORGANIC FARMING CONDITIONS

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Introduction: Sweet pepper (*Capsicum annuum* L.) is one of the main crops produced in Spain, where some traditional varieties are preserved. However, these landraces have been displaced by commercial hybrids, which have higher yields and multiple genes of resistance to pathogens. The use of traditional varieties in breeding programs could allow the identification of alleles of interest against different stresses and to increase the current genetic pool of sweet pepper.
Aims: The aim of this preliminary study was to evaluate five hybrids obtained from crossing five Spanish landraces with a commercial source of virus resistance (L4 and Tsw) under organic farming conditions. The yield per plant, the average fruit weight and the thickness of the fruit flesh in hybrids and landraces were determined.
Materials and Methods: Single hybrids were developed by manual crosses of five landraces from the COMAV gene bank with a pure line (275) from a commercial variety with the resistance genes Tsw and L4. The genotypes were grown in the spring – summer cycle of 2022 under organic management in a greenhouse and in the field.
Results: The global yield per plant and the average fruit weight were higher in the greenhouse than under field conditions. In the greenhouse, the hybrid vigor was especially remarkable in 13004x275 and 5030x275 hybrids, with an increase in the yield per plant of 72.28% and 78,93% respectively, compared to the midparent value. However, no significant increases in yield per plant in the field were detected. In the greenhouse, the average fruit weight was significantly increased in 13004x275 and 4348x275, with an increase of 24.52% and 26.40% respectively. However, it was reduced in the 5121x275 and Reusx275 by 17.45% and 51.77%. In the field, the average fruit weight increased by 55.96% in 5121x275 and by 42.50% in Reusx275. Related to the thickness, it was observed a significant reduction of 18% in 5121x275 compared to the landrace in field conditions.
Conclusion: A strong effect of the management was observed in the hybrid vigor, determining more positive results in the greenhouse. The average fruit weight showed a complex behaviour, being increased or reduced in certain genotypes depending on the growing conditions. The thickness was barely affected in the hybrids.

Keywords: hybrid vigor, organic farming, traditional varieties

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YIELD, FRUIT WEIGTH AND STEM LENGTH IN SPANISH PEPPER ECOTYPES UNDER DIFFERENT GROWTH SYSTEM

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Introduction: Almería is known for being the orchard of Europe due to the large extension of greenhouses in which commercial F1 varieties are grown. However, the F1 varieties have displaced the varieties traditionally grown in the area (landraces), such as the choricero pepper, with the consequent loss of agrodiversity.
Aims: The objective of this work is to carry out a survey among the materials traditionally used in Almería to identify possible candidates to establish a breeding program, generating new varieties similar to the original ones but more commercially attractive for farmers in the area.
Materials and Methods: 3 choricero pepper landraces from Almería as also Gorostiza, Barranca and Numex Sandia (from the North of Spain) were screened for yield (kg/m2), fruit weight (gr/fr) and length stem (cm) in Almería traditional greenhouse and in net greenhouse in order to identify promising material for stablish a breeding program in the different conditions.
Results: Variety effect showed significant differences for yield, fruit weight and length stem. Within the most productive varieties we found one of the Almería landraces as also Gorostiza and Numex Sandia. For fruit weight, 2 of the Almería landraces showed the heaviest fruit weigth. The effect of greenhouse type did no show significant differences. For lengh stem, 2 landraces from Almería showed the thicknest stems.
Conclusion: During this screening it was found enough variability for the traits under study, yield (kg/m2), fruit weight (gr/fr) and length stem (cm) to stablish a recovery breeding program. The fact of not finding significant diferences in the greenhouse type could be a indication of the adaptability of the different materials.

Keywords: landrace, agrodiversity, conservation, choricero

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PRINCIPAL COMPONENT ANALYSIS OF IPGRI TRAITS IN PEPPER (*CAPSICUM ANNUUM*) ECOTYPES FROM SOUTHERN SPAIN

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Introduction: With the implementation of the use of F_1 pepper (*Capsicum annuum*) varieties in Almeria agriculture, the use of traditional varieties has been reduced to the point of almost disappearing. This causes a serious loss of agrodiversity, so it is important to carry out studies that help the conservation of these cultivars. Spain, as a center of pepper diversity, plays a very important role in this task, which is why we need to clarify the phenotypic diversity that we have in our germplasm.
Aims: Identify the phenotypic variability that we can find in the varieties of pepper under the denomination of choricero pepper, using the IPGRI characters through the principal component analysis.
Materials and Methods: Different traditional varieties used historically in the province of Almería, together with several traditional varieties from the North of Spain, were tested in Almería in a plastic greenhouse and net greenhouse for their phenotyping, later an analysis of principal components was carried out.
Results: The principal components analysis showed that among the components that most contribute to the differentiation of each variety were: fruit length, wall thickness, plant height, average fruit weight and number of fruits per plant. Landraces from Almería showed the choricero peppers with the thicknest wall and the heaviest fruits. However varieties from the North of Spain showed the biggest number of fruits per plant.
Conclusion: The principal component analysis show to be a useful tool to make the differentiation between pepper (*Capsicum annuum*) varieties. The most important characters for characterization of the landraces were fruit length, wall thickness, plant height, average fruit weight and number of fruits per plant and number of fruits per plant.

Keywords: landrace, agrodiversity, conservation, *Capsicum annuum*

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COMPREHENSIVE STUDY REGARDING THE CURRENT KNOWLEDGE OF FUNGAL GRAPEVINE TRUNK DISEASES IN ROMANIA

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Introduction: Over the last decade, increasing reports of damage caused by grapevine trunk diseases (GTDs) have raised concerns in all wine-producing countries. As up to now, no study was performed regarding the GTDs situation in Romania, an important grapevine grower in Europe.
Aims: In this study, we review the scientific information related to these diseases in Romania in order to open a national platform in an international framework.
Materials and Methods: After consulting more than 300 references from different scientific databases, this approach concludes that, in Romania, there is a limited amount of specialized literature available in this field.
Results: Three GTDs (out of the 6 reported worldwide) are reported and well documented in all wine-growing areas in Romania (exception, viticultural zone 4). These are Eutypa dieback, Phomopsis dieback and Esca disease. Among the fungal pathogens considered responsible, *Eutypa lata*, *Phomopsis viticola* and *Stereum hirsutum* are the most studied and well documented in Romania. Management measures are quite limited, they include mainly preventive measures to stop the spread of pathogens, the main and safest recommendation being the removal of the affected vines.
Conclusion: In the present work, we have shown that there is limited available data on grapevine trunk diseases in Romania, so a more intense research activity on the subject is needed as Romania is a very important grapevine cultivation country both in Europe and in the world.

Keywords: fungal pathogens; grapevine trunk diseases (GTDs); Romanian vineyards, GTD management

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EXPRESSIVITY AND VARIABILITY OF THE MAIN CHARACTERS OF CHERRY TOMATOES FROM CORE COLLECTION OF THE BUZAU PLANT GENETIC RESOURCES BANK

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Introduction: Although it is well known that cultivated germplasm resources provide an important genetic basis for both breeding and genetic research (Thornsberry et al., 2001). Conventional tomato (*Solanum lycopersicum* L.) descriptors are of great utility for gross morphological characterization but may not be practical for the precise fruit description required for distinguishing closely related cultivar groups (Figàs, M. R. et al., 2015). Most species within the *S. lycopersicum* complex can reciprocally hybridize with cultivated tomato, with the exception of *S. habrochaites* (Robertson and Labate, 2007).
Aims: Phenotypic characterization of cherry tomato variety from core-collection in order to obtain a new morphotype with distinct phenotypic expressiveness and qualitative characters.
Materials and Methods: Breeding procedures were carried out both in protected and open field for all genotypes under study and the breeding methods used were classical breeding, segregation and selection.
Results: Following the breeding process, from the segregations obtained, a variety was selected in the F2 generation, genotype L 312 A, which proved to be phenotypically distinct. This genotype is part of the assortment of medium cherry tricolor tomatoes with high firmness, ovoid fruit weighing about 30 g on average, a number of two seed lobes and a length/diameter ratio of 1-1.2.
Conclusion: In the present research work, we succeeded in stabilizing a new tricolour cherry tomato variety with distinct phenotypic expressiveness and superior quality traits from the germplasm base of the Buzau Plant Genetic Resource Bank. Future prospects aims to approve and patent the variety.

Keywords: breeding, selection, segregation, morphotype, germplasm

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SIDERITIS SYRIACA – A NEW SPECIES INTRODUCED INTO CULTURE AT PGRB ROMANIA

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Introduction: *Sideritis syriaca* is an endemic plant in the mountains of Crete, well-known from the antiquity (Karousou R. et al., 1992). Also named Malotira, it has been used as an anti-inflammatory, antimicrobial, antioxidant and analgesic agent in folk medicine (Goulas V. et al. 2014). In Romania, the Domnesc variety was created in 2019 as a result of breeding and acclimatization to *S scardica.*
Aims: acclimatization, identification of suitable areas for cultivation in Romania and breeding to obtain genotypes with distinct phenotypic expressiveness that meet the international norms of the DUS test.
Materials and Methods: Genetic resources from the germplasm collection of PGRB and endemic resources acquired from the area oforigin. Breeding methods used: repeated individual selection followed by negative mass selection.
Results: Type E was selected from the 5 varieties obtained, based on its valuable phenotypic characteristics and good response to environmental conditions; during the three years of study, the plants were monitored, biometric measurements were performed, the culture technology was established; the observations showed an optimal evolution and development of the plants: biomass was 286g in the first year and 1495g in the third year. The establishment scheme of the culture was 70cm between rows and 40cm between plants/row.
Conclusion: Breeding and acclimatization of the *S. syriaca* species to the climatic conditions of our country were achieved, conditions for the approval of a new variety were created, culture technology was developed.

Keywords: breeding, antioxidant, Malotira

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INFLUENCE OF CLIMATE CHANGE ON THE PHENOLOGICAL STAGES ON THE SOUR CHERRY GENOTYPES

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Introduction: Sour cherry is a fruit species with a special importance in the countries of Eastern Europe. Worldwide, sour cherries along with sweet cherries provide 40% of fruit production (Grădinaru, 2002). In Romania, sour cherry tree found favourable culture conditions, due to the high ecological plasticity. Production and survival of fruit trees in temperate zones depends by phenophases and time of growth in synchrony with temperature of seasonal changes. Recent research shows that global climatic changes have influenced plants especially in the development of phenological stages (Sîrbu et al, 2016).
Aims: The present study establish the influence of changes in climatic conditions on the development of ten sour cherry cultivars from Research Station for Fruit Growing Iaşi, Romania for the first four phenological stages: bud swelling, budburst, beginning of flowering, and end of flowering over three different periods of time.
Materials and Methods: The experiments were performed on ten sour cherry cultivars existing in the sour cherry germplasm fund from Research Station for Fruit Growing Iaşi. Phenological observations followed the development of phenophases organs of growth and flowering by recording data according to milestones (Meier et al., 1994): bud swelling, bud burst, beginning of flowering and end of flowering. The results obtained were interpreted statistically and the differences were determined by Duncan's test ($p \leq 0.05$). Pearson correlation coefficient was calculated between variables measured ($p \leq 0.05$).
Results: Regarding the SAT, significant values were recorded only in the case of the flowering phenophase. Thereby, it was observed that in the years with low temperatures during March- May, when the phenological phases have taken place, the period between the BBCH 61 and the BBCH 69 is greater compared to the normal years according to the climate conditions.
Conclusion: The evaluation of sour cherry cultivars for different periods of time make up the characterization of the phenological response to climate change and the plasticity of the behavior of different cultivars under different environmental conditions. This will enable the development of predictive models for sour cherry phenology and help anticipate breeding strategies to maintain and improve sour cherry production.

Keywords: climate change, cultivar, phenophases, sour cherry tree, temperature.

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ANALYSIS OF MICROFINANCE IMPACT

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Introduction: Microfinance is a developing sector with considerable potential and an important role in the socio-economic development of a country, especially low-income countries. Occupying a special place in the non-bank financial system, microfinance is an engine of economic growth as an important source of financing, which in recent years has been strongly promoted around the world. Studies in this area have shown that access to microfinance can reduce poverty and contribute to growth as well as job creation.
Aims: Studies in this area have shown that access to microfinance can reduce poverty and contribute to growth as well as job creation. As a result, in the European Union, microcredit practices vary considerably depending on the type of institution providing the microcredit, its legal status, the environment in which it operates and its own ability to apply effective management procedures. Globally, the principle behind microfinance is to provide loans to meet the needs of entrepreneurs, create new jobs or support new business ideas and start-ups.
Materials and Methods: Regarding the research method, for the purpose of the study, a comparative analysis of microfinance systems at the national and international level was performed. By means of this method, the information from the studied sources was systematized and a point of view and a conclusion regarding the studied object was formulated.
Results: In the current legal framework governing microfinance activities in Romania, there is no specific definition of microcredit/microloan or microfinance. Therefore, the following definition, used in the European Union, is generally accepted by the industry and stakeholders: "Microfinance includes guarantees, microcredit / micro-loans, capital investments, accompanied by business start-up and development services, provided in the form of individual counseling, training and guidance, provided to individuals and micro-enterprises who have difficulty accessing financial services for professional purposes and / or to finance income-generating activities ".
Conclusion: Microfinance has a significant contribution in the socio-economic development of a country, having an impact on the lives of the beneficiaries, in the sense of improving the standard of living. At the same time, the microfinance market is a competitive one and requires the adaptation of financial services according to the customer needs.

Keywords: financial services, microfinance, socio-economic impact

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EVALUATION OF THE MAIN QUALITATIVE AND QUANTITATIVE CHARACTERS IN THE NEW GENOTYPE OF SALSOLA SODA STUDIED AT THE BUZAU PLANT GENETIC RESOURCES BANK

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Introduction: The genus *Salsola* (commonly known as saltwort) belongs to the family *Amaranthaceae*, previously *Chenopodiaceae*. The genus name is from the Latin words "salsus" or "sallere" meaning salty because they are halophytes capable of living in saline environments or due to their content of alkaline salts, such as potassium and sodium carbonates (Mai et all., 2022). *Salsola* species have a variety of features that contribute to their recognition as a potential forage species in from semi-arid to dry settings along sea beaches, such as extensive seed production, and resistance to extreme climatic conditions including high temperature and extended drought conditions (Murshid et all., 2022). Salinization combined with recurrent droughts and higher uncertainty in climate stability represents a serious threat to agricultural production in many regions around the globe (Centofanti T. and Banuelos G.,2015).

Aims: Soil salinity is becoming the key factor constraining agricultural production, which is why salt-tolerant species are increasingly being considered and will be of great economic importance. Salsola soda is a plant with multiple uses: food, biodesalinant, companion plant in intercrops.

Materials and Methods: Within the group of halophyte plants conserved in the Bank's germplasm collection, the species *Salsola soda* has been studied with particular emphasis, carrying out phenological observations, biometric determinations and laboratory analyses according to UPOV and IGPRI descriptors.

Results: Following the observations, the genotype L3 was stabilized with the following characteristics: plant height: 134 cm; plant diameter: 109 cm, green mass: 2078g.

Conclusion: The genotype studied meets the DUS test, can be cultivated throughout our country, especially on arid and high salinity soils, and can be used in various human food preparations.

Keywords: biodesalinating, core collection, genotype, halophyte.

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INFLUENCE OF THE CLIMATIC CONDITIONS OF THE YEAR 2022 ON THE GRAPEVINE PHENOPHASES IN TÂRNAVE VINEYARD

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Introduction: Temperature and precipitation are the two main climate factors that affect the growth and development of the grape vine. The vegetation period is another crucial element that influences the grapevine phenophases.
Aims: The aim of this study is to describe how the effects of climate change may affect the evolution of grapevine phenophases in 2022.
Materials and Methods: The weather conditions (temperature and rainfall) and the soil humidity was monitored. The cultivars studied were Selena, Blasius, Rubin, Radames, and two clones: Sauvignon blanc 9Bl and Fetească albă 29 Bl, all homologated at SCDVV Blaj. For the starting of the phenophases (BBCH): budburst, flowering and veraison (change of color of the grape berries) we used the observations from the SCDVV Blaj experimental plots as well as from its own database. 50 observation rounds were made for each cultivar, for every phenopase.
Results: Selena started the budburst in April 29th 2022, when approximately 50% of the buds were at BBCH 05. By comparation Blasius started the budburst in May 3rd 2022, Radames in April 29th Rubin April 27th, Sauvignon blanc 9Bl May 2nd, Fetească albă 29 Bl May 2nd.
The flowering (BBCH 60) started in the first decade of June, Selena, Blasius, Rubin, Radames in June 6th, Sauvignon blanc 9Bl and Fetească albă 29 Bl in June 9th. The veraison (BBCH 80) started in August, Selena in August 9th, Blasius August 5th, Rubin August 3rd, Radames, Sauvignon blanc 9Bl August 4th, Fetească alba 29 Bl August 5th.
The humidity in soil was 16.30 % in the 0 – 20 cm horizon, 16.20% in 20 – 40 cm horizon, 17.50% in 40 – 60 cm horizon, 13.55% in 60 – 80 cm and 15.50% in 80 – 100 cm horizon.
Conclusion: The budding started later due to almost daily rains, the flowering also started later, and it was especially uneven and the completion of phenophase was delayed. In the SCDVV Blaj plantations, as in the Târnave vineyard, the vines did not suffer from pedological drought.

Keywords: climatic conditions, grapevine phenophases, Târnave vineyard

Acknowledgments: This research work was carried out with the support of Ministry of Agriculture and Rural Development, being financed from Project ADER 7.3.3.

FLAVONOID LEVELS IN TRADITIONAL CHORICERO PEPPERS UNDER DIFFERENT ENVIRONMENTAL CONDITIONS

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Introduction: Spain is a center of diversity of species and multitude of traditional varieties adapted to different agroclimatic regions and it is considered as the fifth ranked country in the world for fresh consumption pepper (*Capsicum annuum* L.). Peppers contain a lot of bioactive compounds that provide them a high added value. There is no information about compound levels in "choricero pepper" type which is wide used for gastronomy in Spain, as well as environmental effects or self-improvement of these traditional Spanish varieties. One the most important bioactive compounds are flavonoids, showing a great biochemical and pharmacologic effect.
Aims: This task target was to evaluate quercetin, luteolin (main flavonoids) levels in traditional fresh varieties of "choricero" types pending on factors as the environmental effect and genotype over these compounds.
Materials and Methods: Varieties 1,2,3 (from South Spain) and 13,14,15 (from North Spain) were grown In Almeria area (Spain), under 2 different environmental conditions, plastic greenhouse where the production is intensive and net greenhouse, the traditional method. A high-resolution chromatograph, HPLC (Agilent 1220 Infinity model), was used for measurement of flavonoids, using a protocol for extractions based on Bae *et al*. 2012.
Results: Differences were found among accessions for both compounds (quercetin and lutenin) in the studied accessions, particularly in 1 and 13-3, for less and higher levels respectively, and for luteonin between 1 and 13-14. Moreover, considerably interactions between genotype and environmental conditions were identified.
Conclusion: The differences in flavonoids levels and environmental conditions, suggest that are good opportunities to select "choricero" traditional peppers with high content in flavonoids and also adapted to intensive production (plastic greenhouse), opening a possibility to rescue traditional varieties clearly in regression**.**

Keywords: quercetin, luteonin, flavonoids, choricero

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Acknowledgements: This study was possible thanks to the AEI, project PID2019-110221RR-C32 and to the greenhouse grower Manuel Martín in El Ejido, (Spain).

TOTAL CAROTENOID LEVELS IN DRIED CHORICERO PEPPERS UNDER DIFFERENT GROWING CONDITIONS

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Introduction: Pepper (*Capsicum annum L.*) is a prominent cultivated horticultural crop that is traditionally used for food seasoning (fresh and dried) and is applied for the treatment and prevention of multiple diseases. One of the final products obtained from the choricero-type pepper (traditional landraces), is an artisanal product, traditionally obtained after drying the fruit under the sun and subsequent rehydration for its gastronomic use, both as a colorant and for the pleasant flavor it provides to stews. One of the most striking characteristics is its color, due in large part to its high content of carotenoids. Studies attribute to this compound various beneficial properties for health, among others antioxidant, antitumor and provitamin A (Rodríguez-Burruezo and Nuez, 2006). This nutraceutical value can provide to traditional landraces of choricero a valuable asset in front of the reduction of agrodiversity due to the introduction of high productivity F1s in the market.
Aims: This task target was to evaluate total carotenoid levels (red and yellow) in traditional dried varieties of "choricero" for genotype effect and environmental effect under two treatments (plastic greenhouse and net greenhouse).
Materials and Methods: Varieties 1,2,3 (from south Spain) and Gorostiza, Guernika and Barranca (from North Spain) were grown under 2 different environmental conditions, plastic and net greenhouse. Then, they were dried under traditional method which is dry under sun (14 h/day) for 30 days, and finally measured with HPLC.
Results: Differences were found for total carotenoids among studied accessions and treatments. More carotenoids were found in plastic greenhouse conditions and considerably differences were identified among genotypes, with the highest levels of the compound in Barranca variety.
Conclusion: The differences in total carotenoids levels and environmental conditions, suggest that is possible to start a breeding program to reinforce the selection of "choricero" traditional peppers with high content in carotenoids with the aim of introducing nutracetical added values for human health consumption.

Keywords: carotenoids, choricero, nutraceutical, agrodiversity

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Acknowledgements: This study was possible thanks to the AEI, project PID2019-110221RR-C32 and to the grower Manuel Martín in El Ejido, Spain.

VINE SHOOT WASTE USED AS MIXTURE IN CEMENT PASTE

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Introduction: A significant environmental concern is the large amount of lignocellulosic waste that results from agriculture and various industries. The category of agricultural waste also includes the waste from viticulture, which is one of the most widespread agricultural activities in Romania. A large quantity of vine shoot waste is obtained after pruning. The resulted waste represents the lignocellulosic biomass that can be used in various branches of the industry. The energy production is one of the most important applications of this lignocellulosic biomass. Another application of the vine shoot waste is as additional component for cement-based materials.
Aims: This study presents the structural characterisation of cement-based materials made of lignocellulosic biomass.
Materials and Methods: The raw materials, cement, and vine shoot waste, used in the study were structurally characterized using different methods, for example, the Scanning Electron Microscopy and Fourier Transform Infrared. Two types of samples were obtained: cement paste and a mix of cement paste with 10% vine shoots waste.
Results: The addition of lignocellulosic biomass to the cement paste shows an improvement of the structural composition. Adding vine shoot waste in the composition of the cement paste produces a much more compact and dense structure with a large amount of hydration products. Due to the high water absorption in biomass, the water requirement to produce the cement paste increases. By adding lignocellulosic biomass into the cement paste composition, a new bio-composite material is created.
Conclusion: The study describes a step toward a new area of utilization for vine shoot waste, whose utilisation in cementitious materials has a positive impact on the environment by decreasing the quantity of waste.

Keywords: Cement paste, lignocellulosic biomass, vine shoots waste

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INFLUENCE OF UREA FERTILIZATION AND UREASE INHIBITOR ON GROWTH AND YIELD OF SAFFLOWER (*CARTHAMUS TINCTORIUS* L.) UNDER DIFFERENT TILLAGE PRACTICES

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Introduction: Safflower (*Carthamus tinctorius* L.; Asteraceae) constitutes a versatile minor oilseed crop that can be utilized for edible oil production, as a vegetable crop, cut flower, forage crop for animal feed, industrial crop for dye production, as well as medicinal crop. Nitrogen fertilization is important for plant growth and development. Because of the problems caused by urea, which is mainly used in nitrogen fertilizers, new types of fertilizers have inhibitors, that control the fertile disposal in soil. In addition to fertilization, tillage practice is important in order to maintain soil productivity and to prepare a good seedbed.
Aims: This study aimed to evaluate the effects of implications of urea fertilizer with and without urease inhibitor [N-(n-butyl) thiophosphoric triamide, NBPT], and conventional and no-tillage systems on plant growth and yield of safflower crop.
Materials and Methods: A field experiment was laid out in a split-plot design with four replications, two main plots (conventional and no-tillage system), and three sub-plots (control, urea with and without urease inhibitor). The measurements included plant height, fresh and dry weight, seed yield, and yield components (number of capitula, number of seeds per capitulum and thousand-seed weight).
Results: The results indicated that fertilization significantly affected plant height, fresh and dry weight, seed yield and number of capitula and the highest values observed with urea with urease inhibitor. Tillage practice influenced the number of capitula and number of seeds per capitulum, and the higher numbers were found under conventional tillage.
Conclusion: The findings of the present study imply that urea fertilizer with urease inhibitor was very efficient and contributed a notable impact on the plant growth and yield of safflower crop.

Keywords: *Carthamus tinctorius,* conventional tillage, no-tillage, urease inhibitor, seed yield

COMPARATIVE ANALYSIS OF THE CHEMICAL COMPOSITION OF FOUR KALE CULTIVATIONS (*BRASSICA OLERACEA* VAR. *PALMIFOLIA*) PRODUCED IN AN ECOLOGICAL SYSTEM IN A PROTECTED ENVIRONMENT

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Introduction: Cabbage grown especially for leaves (*Brassica oleracea* var. *palmifolia*) is known as a valuable source of various minerals of a particular therapeutic importance. Kale has recently received attention from the health and nutrition sectors due to its nutrient profile (USDA 2015). Available data supports that consumer perception places kale at the top of health food lists. Several studies show that diets rich in probiotics and micronutrients and low in calories play an important role in supporting gut health with the potential to prevent obesity (LEY et al., 2005; DUMAS et al. 2005, WU et al., 2011).
Objectives: The aim of this study was to determine by comparative analysis the macromineral and dry matter content of four series of kale cultivation. The study was carried out in a solarium located in Cluj County, village Băbutiu, during the year 2022, on an ecologically certified plot, in the soil. The cultivations chosen for the study were: Scarlet, Black Tuscan, Red Siberian and Dwarf Curled.
Material and method: The samples were analyzed by atomic absorption spectrometer to obtain the concentrations of Mg, Ca, Na, K, Fe, Cu.
Results: Concentrations of all minerals and dry matter were significantly different according to the cultivar.
Conclusion: The study will be extended for a period of three years and intends to look into some aspects of the production and chemical composition of leafy cabbage according to the production technology.

Key words: chemical composition, ecological, kale, production, solarium.

ENVIRONMENTAL AND GENOTYPIC EFFECT ON PRODUCTIVITY, NUTRITIONAL AND ANTINUTRITIONAL VALUE OF SELECTED VICIA GENOTYPES IN MEDITERRANEAN CONDITIONS

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Introduction: *Vicia sativa* L. is a multi-purpose crop with high ecological importance [Tigka et al., 2021] and nutritive value. Although is cultivated to a wide range of soil types and climate conditions its yield and nutritive value is unstable and exceedingly affected by environmental fluctuations.
Aims: The study's aim was to evaluate advanced breeding lines and commercial cultivars of V. sativa for yield, nutritional and antinutritional features in three locations with different environmental conditions
Materials and Methods: Field experiments were conducted in Central, Southern and Northern Greece for two consecutive years in a randomized complete block design with seven common vetch genotypes replicated three times.
Results: The results demonstrated a significant effect of environment, genotype and their interaction (GxE) for all the studied traits with the main source of variation the environment. According to GGE biplot analysis the advanced line BK23 was the most high-yielding and stable, whereas 'Alexandros' and 'BK27' were the best performing in terms of nutritional antinutritional traits, respectively.
Conclusion: The investigation of environmental and genetic interactions can lead to improved *V.sativa* varieties with high-yield and appropriate nutritive values for high-quality feed products

Keywords: *Vicia sativa,* nutritional, antinutritional, genotype

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EFFECT OF LENTIL COVER CROPPING ON SOIL HYDRAULIC PROPERTIES AND SUBSEQUNET CROP PRODUCTIVITY IN TWO SOIL TYPES IN CENTRAL GREECE

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Introduction: Agricultural management practices can significantly affect soil hydraulic properties and processes in space and time. Cover crops are described as "crops grown primarily for the purpose of protecting and improving soil between periods of regular crop production". They have long been valued for their soil conservation benefits, including reducing erosion, increasing infiltration, and improving soil health (Haruna *et al*., 2020).
Aims: Taking into account the above, the objectives of this study were to examine the effects of various lentil cover cropping managements (viz. classic rotation and green manuring) on (i) soil hydraulic properties and (ii) subsequent corn yield, in two different soil types commonly met in Greece.
Materials and Methods: Experiments were carried out on a clayey and on a sandy soil, following a RCB design, for two years. Three legume managements were tested before growing corn (rotation, incorporation as green manure, no cover crop). Soil hydraulic properties were assessed with the equation $I = S*t^{-1/2} + K_{tr}*t + d$. (Youngs, 1991). Corm productivity was determined by field samplings.
Results: Green manuring and rotation with lentil, lowered the Infiltration rate as well as the Hydraulic conductivity in the sandy soil, suggesting less irrigation water losses and higher water exploitation for the subsequent crop. On the contrary, no statistical differences were detected for Infiltration rate for the clay soil; only Hydraulic conductivity of transiting zone was affected and especially during springtime. Legume rotation and green manure positively affected corn kernel yield in both soils.
Conclusion: Results suggest that lentil rotation or green manuring has positive effects on soil hydraulic properties, especially on sandy soils, by enhancing water sorptivity and lowering permeability, respectively, leading to higher yields for subsequent corn crop.

Keywords: corn, lentil**,** soil hydraulic properties

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LOCAL GENETIC RESOURCES FOR THE RECONSTRUCTION OF THE BIODIVERSITY OF VITICULTURAL ECOSYSTEMS IN ORDER TO IMPROVE THE QUALITY OF GRAPES

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Introduction: At a time when the reconstruction and strengthening of the biodiversity of viticultural ecosystems has become a priority objective, to substantially reduce the use of fungicides is to use disease-resistant varieties. Currently, we are observing a very important change due in large part to the need for ecological sustainability of vineyards.
Aims: The aim of this study was to promote biodiversity to achieve a stable viticultural ecosystem and to increase the quality of grapes by using autochtonous disease-resistant cultivars.
Materials and Methods: The study was carried out between 2015-2021 in the experimental plots of SCDVV Blaj, cultivated with seven autochthonous cultivars obtained by hybridisation: Selena, Blasius, Rose Blaj, Rubin, Radames, Brumariu, Astra. The present study focused on a combination of agroecological techniques applied /plot/vcultivar: grassing between rows: natural/sown, total/partial, maintenance of vine rows by: chemical/mechanical weeding, agro-ecological practices: grass strips, flower strips, hedges, planting shrubs at the ends of each row, planting fruit trees, providing structural elements (piles of stones or wood), use of biopesticides and biological methods of pest control.
Results: The observed effects of biodiversity conservation practices differed between grape cultivars. The disease resistance of the Rubin, Radames, Brumăriu varieties led to an increase in the production of phytochemical compounds, having a positive effect on the quality of the grapes and the stability of the viticultural ecosystem. Biodiversity and immunity of the studied viticultural ecosystems has improved a lot in the last five years, as a result, although the application of chemical pesticides has been reduced to a minimum, grape harvests have stabilized in terms of quantity and quality.
Conclusion: The benefits of biodiversity on grape quality depend on the grapevine cultivar.

Keywords: biodiversity; grapevine cultivars; viticultural ecosystem

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HERBICIDES IN EUROPE DURING THE 21ST CENTURY: A COMPARATIVE ASSESSMENT USING AGRI-ENVIRONMENTAL INDICES OF EU_{27}

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Introduction: To estimate the progress in the use of herbicides during the first 20 years of the 21st century at EU level, the annually available data at a national level under certain conditions could be used. On the other hand, the official data on herbicide sales are not definite in order to understand which quantities were used in EU agricultural land and which in urban environments or other purposes. According to recent studies, it is estimated that approximately up to 9% of total herbicide quantities come from a non-agricultural use in EU while is varied greatly among EU countries.
Aims: The aim of this study is to express the herbicides use in Europe in conventional agricultural land, through a reliable and comparative index among four geographical sub-regions (Southern, Northern, Western, and Central-Eastern) in the European union of 27 Member States.
Materials and Methods: A reliable and comparative Herbicide Index (*HI*) was assessed to describe the herbicide use in the conventional agricultural land (*AL*) of Europe during the first 20 years of the 21st century. HI is not uniform across EU_{27}.
Results: The highest mean value was observed in the Western EU, compared to other sub-regions of EU. Linear discriminant analysis (LDA) of 19 variables was examined to describe this differentiation. The examined agri-environmental indicators such as crops groups "Root crops", "Fresh vegetables" (high-value crops) and the herbicide chemical family "carbamates" had a more negative than positive impact on the *HI* formation.
Conclusion: In conclusion, the impact assessment of each variable which was examined on the HI could contribute to the implementation of European agricultural policy, reducing in this way the environmental impact.

Keywords: Agri-environmental pollution, crop groups, farm size, herbicide chemical families, Herbicide Index (*HI*)

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PERSPECTIVES ON THE EXTENSION AND DIVERSIFICATION OF BASIL (*OCIMUM BASILICUM* L.) ASSORTMENT BY EXPLOITING GENETIC RESOURCES CONSERVE AT THE PLANT GENETIC RESOURCES BANK OF BUZAU

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Introduction: Species of the genus *Ocimum* are widely used and appreciated due to their essential oil that includes several components of interest (Costa, A. et al., 2014). *Ocimum basilicum* L. exhibits a great variety of cultivars grown for various purposes. The aim of this work was to study the resolving power of morphological traits for reliable identification of basil accessions (Carović-Stanko, et al., 2011). *Ocimum* species are a rich source of diverse specialized metabolites (including monoterpenes, sesquiterpenes, and phenylpropanoids) and have numerous pharmacological activities as well as insecticidal properties (Mahajan et al., 2015).
Aims: Diversification of the current indigenous assortment of the genus *Ocimum* by obtaining new distinct genotypes with superior qualities, following classical intraspecific hybridization and determination of their chemical composition qualities.
Materials and Methods: The germplasm collection contains 63 genotypes of which 27 are genetic stable. Among the stable genotypes, 4 genitors were extracted as breeding material. The breeding procedures used were classical hybridization, negative mass selection, segregation. Laboratory analyses were also carried out in terms of chemical composition decription.
Results: Two hybrid combinations were obtained and generated 4 distinct genotypes in which genetic stabilization was achieved, intermediate forms being eliminated throughout the study. *Ocimum basilicum* L. x *Ocimum basilicum* var. *thyrsiflora*, *Ocimum basilicum* var. *citriodorum* x *Ocimum basilicum* var. *purpurascens* were the crosses. The newly obtained genotypes, G15, G16, G13 and G9 showed strong traits inherited from both parents, with superior biochemical and phenotypic traits.
Conclusion: In the present research work, as a result of intraspecific hybridization, 4 new genotypes were obtained which enrich the local assortment of aromatic and medicinal plants of the genus *Ocimum.*

Keywords: preservation, hybridization, genotype, aromatic, medicinal

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EFFECT OF LAND-USE INTENSIFICATION ON SOIL PROPERTIES AND PLANT SPECIES DIVERSITY IN THE MEDITERRANEAN AGROECOSYSTEM

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Introduction: In recent decades, agriculture in Greece has undergone significant changes mainly due to the intensification of land use, which may have a significant impact on soil properties and plant species diversity as well. Alfalfa (*Medicago sativa* L.) and maize (*Zea mays* L.) are crops which could be included in an integrated crop rotation system even with the participation of a winter wheat, providing higher crop yields over time. Despite the fact that the usual rotation strategy followed is the one- or two-year maize cultivation followed by a 4-year cultivation of alfalfa, in many cases maize is cultivated as monoculture for several years.
Aims: The aim of this study was to investigate if these cultivation systems influence some of the main edaphic properties and plant species diversity and which are the main anthropogenic interventions which may have a decisive role in the changes of soil physicochemical properties and the reduction of plant species.
Materials and Methods: Three land-use types such as maize crops, alfalafa and abandoned land were selected and ten fields with an area of approximately 1 ha in each land use type were taken.
Results: From the edaphic parameters which were examined the pH, sand, electrical conductivity (EC), soil organic matter (SOM), NO_3^- as well as Ca^{+2} and Cu^{+2} soil concentration presented statistically significant differences. In total 122 taxa belonging to 30 families were recorded, while the families with the greatest species diversity were Poaceae, Asteraceae and Fabaceae in each land-use.
Conclusion: In conclusion, different agronomic practices influence soil nutrient content, soil salt content and soil compaction, which are likely to affect species diversity and the environmental implications among different land uses.

Keywords: Agroecosystem, land use, soil properties, species diversity

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SESSION 6: ANIMAL SCIENCE

GENETIC DIVERSITY OF ENDANGERED ROMANIAN GREY STEPPE CATTLE BREED

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Introduction: Romanian cattle breeds are classified by many researchers into primitive breeds (Grey Steppe and Mocanita) and improved breeds (Romanian Spotted, Romanian Black Spotted, Brown, Pinzgauer) (Creangă and Maciuc, 2010). Endangered Romanian Grey Steppe belongs to the category of the oldest cattle breeds native to Europe, belonging to the genus *Bos taurus primigenius* (Bodò, 2014) and having a common ancestor with other European cattle (Andalusian, Romagnola, Podolica, Ukrainian Gray, etc.) (Davidescu, 2019). Characteristic of this breed are the special biological qualities which has distinguished itself as a native breed over time: adaptability increased to severe climate and diseases, hardiness and longevity.
Aims: The purpose of this paper is to supplement the existing information in literature on genetic diversity and phylogeny of romanian Grey Steppe.
Materials and Methods: This work was carried out after consulting the specialized literature from various national and international databases: Google Scholar, Web of Science, Scopus, PubMed, etc. Revised bibliographic references on endangered cattle breeds in Romania, including Grey Steppe, confirms that they are carrying a reservoir of valuable genes that must be preserved by application different reproductive biotechnologies.
Results: The results of this work clearly show the fact that the Grey Steppe is an indigenous breed, descended from *Bos taurus primigenius* and the results obtained based on mitochondrial DNA analysis demonstrate this.
Conclusion: The results of this research may contribute to the improvement of the program conservation of this breed and up-to-date information on genetic diversity, a valuable tool for conservation efforts endangered gene reserves.

Keywords: Conservation, Grey Steppe, genetic diversity.

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CHRONOLOGICAL DYNAMICS OF CERTAIN MORPHOLOGICAL TRAITS IN SHAGYA ARABIAN BREEDERS

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Introduction: The "Pure breed Shagya Arab Society International" states that the Shagya Arabian breed must have different characteristics from the Arabian Purebred breed in terms of morphological type, height at withers, body frame, and skeleton, and that in the 4th generation, out of 16 ancestors are not allowed more than 9 individuals of Arabian Purebred. It was expressed the desire to breed a dynamic horse with a wide body frame, suitable for riding, that expresses the energy capacity specific to performance sports, hunting and leisure, lively temperament, friendly character, and noble appearance; his height at withers had to range between 150-162 cm, and the cannon girth had to be at least 18 cm.
Aims: The study aimed to analyze the broodmares included in the brood stock between 1989-2018 and the public breeding stallions registered in the ranking sheets ranged from 2000-2010 of the Shagya Arabian horse breed, from the Radauti Stud farm, Suceava county, Romania.
Materials and Methods: Biomorphometry was used to assess the values of height at withers, thoracic circumference, and cannon circumference on 180 broodmares and 47 breeding stallions, to follow the evolution of the breed within the stud. The data were subsequently used to synthesize the morphometric indices (massiveness index, dactylo-thoracic index, bone index).
Results: The average values of the females height ranged from 156.7±0.069 cm (Koheilan bloodline) to 159.9±0.102 cm (El-Sbaa bloodline); the average values for heart girth felt within the 180.1±0.151 cm (Shagya bloodline) - 180.8±0.153 cm (Mersuch bloodline) interval; the average values of cannon circumference varied between the 18.0±0.11 cm (Mersuch bloodline) to 18.8±0.09 cm (El-Sbaa bloodline). The minimal value for withers height in stallions was found in Hadban bloodline (157.66±1.21 cm) while the maximal one occurred in Koheilan bloodline (161.22±0.84 cm); average values of the thoracic circumference varied between 177.25±4.09 cm (Mersuch bloodline) and 183.33±1.83 cm (Koheilan bloodline); cannon perimeters had average values between 18.5±0.77 cm (Gazal bloodline) and 19.16±0.31 cm (Koheilan bloodline).
Conclusion: Genders comparison revealed that stallions had higher average values of the height than the females, except for the El-Sbaa bloodline, where the difference was higher by 1.14 cm for females. On the heart girth, the average value was lower by 1.5 cm in Dahoman broodmares and by 2.83 cm in Koheilan females, compared to stallions. The cannon perimeter was mostly higher in stallions and slightly lower in Hadban line males (-0.19 cm), compared to the mares. On the morphometric indices, it was found that stallions had higher values of massiveness index (113.21%) vs. broodmares (113.06%) and for the dactylo-thoracic index, as well (stallions had 11.11% and the mares 10.55%), while the bone index was higher in females (11.93%) vs. males (11.81%). It can be stated that the main genetic improvement objective (increasing the height at withers) was pursued and, in most cases, even exceeded. Also, the selection must be conducted using individuals with higher values of cannon perimeter to successfully fulfill the objectives.

Keywords: Shagya Arabian, height, heart girth, cannon perimeter, morphometry.

A REVIEW ON THE QUALITY CONCEPT AND EVALUATION OF FISH PRODUCTS

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Introduction: Appreciated as functional foods, with a high nutritional value and tasty qualities, fish products have come to the attention of consumers as being also prone to perishability, placing emphasis on food safety and their quality.
Aims: Taking into account the fact that the quality of fish products is a subjective concept defined according to different forms of interpretation, this study aims to systematically review the literature on the quality concept of fish products, specifically focusing on methods for quality evaluation.
Main Aspects of Fish Quality Measurements: Generally, quality is a very complex representation of attributes affected by numerous factors, and usually the term "quality" cannot be seen as a specific object (Oehlenschläger, 2013). Specifically, the quality of fish products is frequently described using terms related only to nutritional characteristics, microbiological, biochemical and physico-chemical, but for consumers "quality" mostly refers to the part of the aesthetic appearance and the freshness or degree of alteration of the fish. Looking at other aspects, fish products acquire a certain specificity both in terms of the nutritional quality of the meat due to their composition, as well as their sensory quality due to the particular structure of the muscle components (Lefevre and Bugeon, 2008). Quality evaluation methods have undergone a rapid change from the first days of the introduction of the quality control program, in which the evaluation was based mainly on sensory methods. However, scientific development in food quality assessment along with innovations in instrumentation techniques have become very useful in measuring product quality.
Conclusion: In order to provide a good overview of the quality of the fish product and especially of the state of freshness, sensory and instrumental methods must be corroborated, because they present advantages, but also many disadvantages, when singularly used.

Keywords: Instrumental analysis, fish, freshness, nutritional value, sensory attributes.

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EFFECTS OF DIFFERENT SULFUR SOURCES ON RUMINAL S BIOAVAILABILITY AND FERMENTATION ACTIVITY MEASURED *IN VITRO*

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Introduction: Rumen microbes need minerals for their growth and activity (Meschy, 2010), especially sulfur (S). For high-yielding cows, the diet alone doesn't cover the microbial needs, and S supplementation can allow optimizing fermentation activity. Several sources of S are used today, but their effectiveness of use by the rumen microbes is not well known.
Aims: Understanding of the ruminal solubility and bioavailability of different S forms and their effect on ruminal activity.
Materials and Methods: In vitro fermentations, using a low-S substrate, a S-free buffer and a rumen juice-based inoculum were conducted for 70hrs. The substrate was tested solely (CON), or with an addition of 0.5% DM of one of the 4 S sources: sulfur flower (SF), Na_2SO_4 (NaS), $(NH_4)_2SO4$ (NHS) and $MgSO_4$ (MgS). Fermentation activity was measured by total gas production and substrate dry-matter degradability (dDM%). S bioavailability was assessed by measuring the S conc. in fractions obtained after successive centrifugations of the final fermentation juice, allowing to separate the remaining big particles (feed particles, insolubilized minerals, protozoa), a fraction enriched in ruminal bacteria and the final supernatant.
Results: Gas production after 70 hrs was increased with MgS and decreased with NHS compared to the CON (167±14, 129±17 and 148±15 ml/gDM; P<0.001). dDM% was higher with MgS compared to the CON (70.6±3.7% and 67.1±2.8%, P<0.001). SF had no effect neither on gas, nor on dDM%. S conc. in the big particles fraction was higher with the SF compared to the CON (+34%, P<0.001). S conc. of the bacteria enriched fraction was higher with NaS, NHS and MgS compared to SF and CON treatments (+60%, +65%, +76%, +14% vs CON, P<0.001). Finally, S conc. in the final supernatant was higher with all the sulfate sources compared to SF and CON (resp +206%, +238%, +159%, +16% for NaS, NHS, MgS, SF vs CON; P<0.001).
Conclusion: Sulfate sources of S have a higher ruminal bioavailability and are more efficiently used by rumen bacteria than.

Keywords: Ruminants, solubility, sulfur.

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SESSION 7: BIOTECHNOLOGY

STABLE ISOTOPE ANALYSIS OF DOMESTIC ANIMAL REMAINS FROM ROMANIAN ARCHAEOLOGICAL SITES – PRELIMINARY DATA

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Introduction: Stable isotope analysis offers important information regarding land and animal management strategies. Since the tissues of a consumer will reflect the isotopic range of the foods ingested, by using carbon and nitrogen isotopes we can gain information on the major classes of nutrients. Their different values will illustrate not only the separation between wild and domestic animals, but also the separation on trophic levels and certain management practices: the areas chosen for grazing, soil fertilizing techniques or the use of C3 or C4 plants as foodstuff.
Aims: The present study is aimed at facilitating the understanding of land and animal management techniques practiced at the Potaissa castra (Turda, Cluj, Romania) during the Roman settlement.
Materials and Methods: Bone collagen was extracted using an adapted acid-alkaline-acid technique. The bone was ground to a powder, treated with 1N HCl, followed by 0.1% NaOH and gelatinized in 1N HCl by incubating the samples at pH 3, 56ºC, for 16 hours. Samples were then filtered to remove any contaminants and the collagen solution was obtained through ultrafiltration using the Pierce™ Protein Concentrator PES, 30K MWCO.
Results: Bone collagen was extracted from 6 pig bones recovered from the Roman Archaeological site of Potaissa (Turda, Cluj, Romania), likely originating from the military kitchen.
Conclusion: Lyophilized collagen samples were sent to third parties for IR-MS and AMS analysis, and further steps will involve integrating the C and N stable isotope data into a geographical context and historical framework.

Keywords: Carbon, Nitrogen, Stable isotope, collagen, animal bones.

ANALYSIS OF PHARMACEUTICAL ASPIRIN TABLETS BUFFERED AND UNBUFFERED USING VIBRATIONAL SPECTROSCOPY

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Introduction: Aspirin and other NSAIDs (non-steroidal anti-inflammatory drugs) are good for help decrease both pain and inflammation, the analgesics are designed purely for pain relief. Pain medications (analgesics) vary considerably. Each pain medication has its advantages and risks. Specific types and causes of pain may respond better to one kind of pain medication than to another kind. In addition, each person is slightly different in the way they respond to a pain medication.
Aims: Commercial aspirin (tablets) have been investigated using FT-Raman, Raman and further used for surface enhanced Raman scattering on Ag colloidal nanoparticles.
Materials and Methods: Aspirin (buffered, and unbuffered tablets using that medicine in Romania) without another purifying in experiment was used. Aspirin solutions were obtained by tablet dissolving in distilled water, at 50°C, and 15 minute ultrasonicated. One tablet aspirin was in 10 ml, and 20 ml distillated water dissolved. The SERS spectra were obtained at different concentrations using a silver colloid that metallic substratum. The micro-Raman and the SERS spectra of the aspirin on silver colloid were recorded with a Dilor Raman micro spectrometer (Horiba-Jobin-Yvon, model LabRam) using the 514.5 nm excitation line from an argon ion laser (Spectra Physics, model 2016).
Results: The active compound present in tablets could be accurately identified and monitored even through the blister pack. The SERS spectra of aspirin of different concentration have been obtained and discussed. Different adsorption behaviors of these molecular species are discussed in the SERS spectra.
Conclusion: The micro-Raman spectra of buffered and unbuffered aspirin may be obtained at different depths revealing differences between the middle and the surface of tablets. SERS spectra of aspirin could be recorded even at low concentrations with a conventional SERS setup (10^{-6} – 10^{-9} mol l^{-1}).A change in the molecular identity (aspirin→ protonated form) on going from basic to acid pH values could be evidenced by analyzing the SERS spectra.

Keywords: Aspirin buffered and aspirin unbuffered, FT-IR, Raman, SERS.

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ASSESSEMNET OF ANTI-INFLAMMATORY DRUGS BY RAMAN SPECTROSCOPIES

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Introduction: The biological activity and the pharmaceutical properties of drugs are strongly dependent on their structure. The use Raman spectroscopy in pharmaceutical industry is gaining much popularity as a quantitative tool due to its rapid and non-distructive nature, sample preparation, ease of use and less or no solvent consumtion for monitoring quality as well as quantity of the raw materilas and finished drug products. (Andronie et al., 2009).
Aims: In the present work, because Raman spectroscopy is a powerful vibrational spectroscopic technique which has been applied in different biomedical applications, we propose the vibrational Raman characterization of two different commercial paracetamol tablets (normal and sinus), in order to distinguish the various action mode in terms of the pH value and to check the possibility to monitor both pharmaceutical species using spectroscopy.
Materials and Methods: Pharmaceutical tablets of paracetamol (Europharm) commercially available "sinus" and "normal" (500 mg active substance content), were used in our study and the solutions of paracetamol were prepared by dissolving 1 tablet in 10 ml distilled water resulting a concentratios of $3.3x10^{-1}$ M. The spectra were collected in the backscattering geometry using a microscope equipped with an Olympus LMPlanFL 50x objective with a spectral resolution of 5 cm^{-1}.
Results: The Raman spectra of both paracetamol tablets were recorded and the marker bands of the characteristic functional groups were identified.
Conclusion: The Raman spectra of both paracetamol tablets were recorded, and the marker bands of the characteristic functional groups were identified.

Keywords: Paracetamol normal and sinus, Raman.

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SCREENING OF THE ROMANIAN MAIZE (*ZEA MAYS* L.) GERMPLASM FOR *CRTRB1* AND *LCYE* ALLELES ENHANCING THE PROVITAMIN A CONCENTRATION IN ENDOSPERM

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Introduction: Maize occupies a significant place in the world agriculture. Yellow kernel maize contains mainly non-provitamin A carotenoids: lutein and zeaxanthin. The accumulation of provitamin A carotenoids is regulated by favourable alleles of lcyE and crtRB1 genes and could be used for the enhancement of these carotenoids in the maize grain through breeding.
Aims: In this study we aimed to perform a molecular screening of the Romanian germplasm, searching for favourable alleles of crtRB1 and lcyE genes and to determine the level of carotenoids in several selected lines.
Materials and Methods: 2746 inbred lines from seven research stations were subjected to a PCR amplification of crtRB1 and lcyE genes in order to identify the favourable alleles. We selected 27 lines carrying the favourable alleles and nine lines with unfavourable alleles (four groups in total), from which total carotenoids, lutein, zeaxanthin, β-cryptoxanthin, β-carotene and retinol equivalents were determined by HPLC.
Results: Out of 2746 inbred lines analysed, 23.53% contained one or both genes with favourable alleles. The favourable allele of the crtRB1 gene was the most widespread (584 lines), followed by the lcyE gene (55 lines), while alleles favourable for both genes were detected in only 7 lines. Inbred lines with the favourable allele of the crtRB1 gene showed the highest levels of β-carotene and β-cryptoxanthin, while those with favourable allele of lcyE gene showed a high level of β-cryptoxanthin; the lines with favourable alleles for both genes had a level of β-carotene 60% higher than the lines with two unfavourable alleles.
Conclusion: Results indicate that these inbred lines with enhanced carotenoid profiles hold great promise for breeding programs as well as for food and nutritional security.

Keywords: crtRB1; lcyE; maize; provitamins A.

STUDIES ABOUT THE USE OF SILICON-BASED NANOPARTICLES (SINPS) TO INCREASE PLANT TOLERANCE TO UV-B RADIATION

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Introduction: Plants are usually exposed to a permanently changing environment that influences their development and life expectancy. By affecting the cellular membranes, the deoxyribonucleic acid (DNA) from the nucleus and all the organelles, including chloroplasts and mitochondria, the UV-B ultraviolet radiations are indirectly causing changes in plant morphology. This damages are directly or indirectly affecting basic metabolic plant processes, such as photosynthesis, respiration, growth and reproduction.
Aims: The aim of this research is the synthesis of silicon nanoparticles that will be used later to increase resistance of ecological tomato crops to UV-B radiation.
Materials and Methods: The characterization of the obtained nanoparticles was performed with scanning electron microscopy coupled with energy dispersive X-ray spectroscopy (SEM-EDX).
Results: The SEM results emphasize that if the pH adjustment is not exact, the synthesis leads to larger nanoparticles to be obtained. The EDX analysis highlights that by using 12.000 MWCO and 3.500 MWCO dialysis sacks and 100.000 MWCO Vivaspin 6 centrifuge concentrators, the impurities are not totally removed from the nanoparticle solution.
Conclusion: The dimension of the dialysis sacks is not suitable for impurities removal, while the dialysis executed by successive centrifugations with Vivaspin 6 centrifuge concentrators leads to carbon accumulation in the final nanoparticle solution.

Keywords: Nanoparticles, UV-B radiation, SEM-EDX.

BIOPROSPECTING OF HALOPHILIC *DUNALIELLA* ALGAE FROM EGYPTIAN ENVIRONMENT AS A RENEWABLE SOURCE OF FOOD, FEED, AND BIOFUEL

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Introduction: *Dunaliella* is a biflagellate unicellular alga that develops unique cellular adaptation to thrive in extreme saline environmental conditions. It also produces high b-carotene stereoisomers to defend the cell from the damaging effect of excessive radiation, antimicrobial substances, antioxidants, hydrocarbons and membrane lipids to compensate for the lack of a cell wall with the presence of an elastic cell membrane. (Hejazi 2003).
Aims: This study aims to isolate the promising strains of *Dunaliella* algae from Egyptian environments, growing at different degrees of salinity, and to study the effect of salinity degrees on the production of protein, fatty acids and biomass.
Materials and Methods: The growth experiments were carried with different salinities (3% to 30%) and the optical density measured at 440nm daily **(Cai et al. 2013)**.
Isolates MU-D3 and MU-D6 were cultured in 250 ml Erlenmeyer flasks, containing 100 ml Modified Johnsons Medium with two different salinities optimum and maximum salinity 35g/l and 90g/l respectively. *Dunaliella* cultures were harvested by centrifugation at 4000 g for 15 min at 24ºC then washed twice with ammonium formate and lyophilized.
Results: The microscopic examination of the isolated strains showed a variation in cell size (10-20 µm) with accumulation of beta-carotenes in strains MU-D2, MU-D3, MU-D6, and MU-D12. *Dunaliella* isolates showed that, isolate MU-D3 and MU-D6 accumulate lipids in cell cytosol. The protein content of the cells of both MU-D3 and MU-D6 strains showed an increase because of salinity from 56.3% to 62.5% for salinities 35g/l and 90g/l respectively. In the same manner, the protein content in MU-D6 from 59.2% to 63.8% for salinities 35g/l and 90g/l respectively. The main two fatty acids found to be C16 and C18:3n3. C16 was increased by salinity increase in MU-D3 while in MU-D6 decreased.
Conclusion: The analysis of fatty acids and amino acids content at salinities showed that these strains could be used as a source of amino acid and protein for food and feed industries.

Keywords: Beta carotenes, Biofuel, *Dunaliella salina,* Halophilic microalgae.

EFFECT OF OIL ADDITION ON THE BIOACCESSIBILITY OF CAROTENOIDS FROM RAW BABY SPINACH LEAVES

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Introduction: A regular consumption of fruits and vegetables, especially those rich in fat-soluble bioactive compounds, can contribute to the prevention of numerous diseases. One of the major bioactive compounds, with important implications for human health, is carotenoids, a class of natural, fat-soluble pigments, responsible for the yellow, orange, and red colors of many fruits, vegetables, flowers, and also some animal organisms.
Aim: This study aimed to investigate the possibility of increasing carotenoid bioaccessibility from fresh baby spinach by adding different lipid sources, with different fatty acid profiles and unsaturation degrees.
Materials and methods: The *in vitro* simulated digestion was performed using the INFOGEST method, consisting of three phases, i.e. oral, gastric and small intestinal phases. Raw baby spinach leaves were subjected to *in vitro* digestion, without and with lipid addition. The resulted digesta was centrifuged at 4 ^{0}C, and an aliquot of the micellar phase was mixed with solvent for carotenoid extraction. The extract was centrifuged, filtered and stored at −80°C. Total carotenoids were extracted also from fresh baby spinach samples. All samples were analyzed by C30-HPLC-PDA and carotenoid quantification was done using external calibration with commercial standards. The fatty acids profile of oil samples was determined by GC-MS.
Results: The main carotenoids identified in baby spinach leaves and in the corresponding digesta were β-carotene and lutein. The lipid sources were avocado pulp (great source of MUFA), sour cream (SFA source) and grapeseed oil (rich source of PUFA). Two concentrations were used for the added lipids. For lutein, adding the three lipid sources had significant negative effects, leading to a major decrease in the bioaccessibility percentage. But, at the same time, the addition of grapeseed oil and sour cream significantly increased β-carotene bioaccessibility.
Conclusions: Even though spinach is a rich source of lutein and β-carotene, the fraction that becomes accessible for absorption is very low. The results presented in this study show that both the type of carotenoid and the fatty acids profile influence the bioaccessibility of these compounds.

Keywords: β-carotene, bioaccessibility, *in vitro* digestion, lutein.

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EFFECT OF GROWTH HORMONES AND COLD TREATMENT ON *ECHINACEA PURPUREA* SEED GERMINATION

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Introduction: Despite the medicinal significance of *Echinacea purpurea*, challenges such as low germination percentage and seed dormancy remain an issue during cultivation. Fariman *et al.* (2011) used cold treatment, gibberellin (GA_3), and KNO_3 to promote germination. Li *et al.* (2007) improved germination by combining different treatments (temperature, etaphone, GA_3, light, prechilling, phosphoric acid and scarification).
Aims: The aim of this study was to investigate the effect of various inexpensive and timesaving chemical and physical methods on the germination of *E. purpurea* seeds.
Materials and Methods: Seeds were treated with GA_3 (150 ppm), benzyladenine (BA, 10 and 50 ppm), or stored for 14 days at 4°C (ColdT). Combination treatments were also applied (ColdT+GA_3, ColdT+BA 10 ppm). Experiments were conducted in sterilized Petri dishes with four replications of 25 seeds for each treatment.
Results: All treatments improved the germination percentage. The highest proportion (96%) was obtained using ColdT and ColdT+GA_3. Treatments with GA_3 and ColdT+BA (10 ppm) resulted the best germination time and rate. Seedlings root and shoot length was significantly reduced by BA (10 and 50 ppm), ColdT+BA (10 ppm) and ColdT+GA_3, but no significant differences in seedlings biomasses were observed. The lowest proportions of abnormal seedlings were in case of ColdT (33.3%), while application of growth hormones produced a higher ratio of abnormal seedlings (67.5-87.5%).
Conclusion: Experiments providing the conditions for further development of the seedlings should be carried out.

Keywords: Benzyladenine, cold treatment, *Echinacea purpurea*, gibberellin, growth hormones.

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CELL-PENETRATING ANTIMICROBIAL PEPTIDES

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Introduction: In several species, antimicrobial peptides (AMPs) play a significant role in the innate immune system, and in the future, they could serve as potential sources of novel antibiotics. A 39-amino acid AMP called buforin I was isolated and identified in the stomach tissue of an Asian toad *Bufo bufo gargarizans* (Cho et al., 2009; Jang et al., 2012). Since its discovery, other active cell-penetrating antimicrobial peptides, namely, buforin II and buforin IIb were synthesized.
Aims: The focus of this research is to present the state of buforins, both from literature and new peptides obtained in this study, in terms of their structures, antimicrobial action mechanisms, and other biological activities.
Materials and Methods: Peptides were synthesised by solid-phased synthesis using Fmoc chemistry and purified by reversed-phase UHPLC coupled with a C18 column. Electrospray mass spectrometry was used to assess the identity of the peptides.
Results: The proline hinge region (QFPVG, residues 5-9) is a crucial structural determinant for the cell-penetrating property, and the cell-penetrating efficiency of the peptides. It relies on α-helical content, that is a crucial factor for defining the antibacterial potency of buforin IIb, according to previous published researches. In physiological buffers, the peptides are very soluble.
Conclusion: The utilisation of AMPs as independent antimicrobial medicines, and as synergistic agents with current antibiotics, represents an attractive theme that need to be further evaluated to determine the potential therapeutic applications of newly designed buforins.

Keywords: Antimicrobial peptides, buforin, cell-penetrating peptides.

Acknowledgements: This work was supported by a grant of the Ministry of Research, Innovation and Digitization, CNCS - UEFISCDI, project number PN-III-P4-PCE-2021-0639, within PNCDI III.

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CAROTENOID LOADED NANOCARRIERS - PREPARATION AND EVALUATION

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Introduction: Lipid nanocarriers have been recommended as emerging carrier systems for many food and biomedical applications. The goal of overcoming issues related to the limited bioavailability of numerous lipophilic bioactive compounds is the key factor of this approach in cosmetics and food research. Due to their agglomeration in the human retina, zeaxanthin and lutein are collectively referred to as the macular carotenoids. Zeaxanthin contributes to the health and function of the eyes and brain, although its bioaccessibility is poor and can be modified by a variety of factors, among them lipid addition.
Aims: The objective was to create nanoemulsions containing carotenoids such as Zeaxanthin (Zea) and Zeaxanthin dipalmitate (ZeaDP) using oils having a different composition of fatty acids(ratio between saturated and unsaturated fatty acids, chain length of fatty acids) and to examine their effect on the bioaccessibility of carotenoids.
Materials and methods: By using solvent extraction and purification on TLC and column chromatography, it was possible to obtain Zea and ZeaDP with a 95% purity from plant material. GC-MS and C30-HPLC-PDA were used to profile five vegetal oils(coconut MCT, olive, sunflower, linseed, and palm oils) and one animal fat(cream) for their fatty acid and carotenoid composition.Ultrasonic emulsification was implemented to create Zea and ZeaDP O/W nanoemulsions (1:9 v/v) that were enriched with carotenoids(0.05 mg/ml) in the presence of an emulsifier at 1 %(Tween 20). NEs were evaluated by DLS, zeta-potential and SEM and were subjected to a stability study under different factors:temperature, salt concentration and pH, over 30 days.
Results: Vegetal oils were discovered to have an excellent incorporation rate of carotenoids in nanoemulsions(up to 98%). PDI was less than 0.3 and the surface was negatively charged(zeta potential). Average diameters ranged between 100-300 nm, depending on the oil type. The stability study revealed that NEs can become unstable under certain stress conditions.
Conclusion: Zea and ZeaDP were successfully incorporated into oil-in-water nanoemulsions. The average hydrodynamic diameter of nanoemulsions depends both on the type of oil and also on the type of carotenoid(higher for ZeaDP).

Keywords: Nanoemulsion, oils, zeaxanthin.

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PRODUCTION OF BIOPLASTICS FROM LIGNOCELLULOSIC BIOMASS

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Introduction: Lignocellulosic waste has a great potential to be used as feedstock for bioplastic production due to its high carbohydrates content. Lignocellulosic waste consists of cellulose, hemicellulose and lignin. Cellulose and hemicellulose can be converted into bioplastics by microbial fermentation with specific strains. The following stages are involved in the production of bioplastics from lignocellulosic waste: pretreatment, hydrolysis, fermentation and polymerization/condensation (Kawaguchi, 2022). Supercritical carbon dioxide pretreatment will be applied for the separation of carbohydrates from lignocellulosic waste.
Aims: The study was performed in the context of the LIBNOBIOPLAST project, which aimed to perform the recovery of lignocellulosic wastes and their conversion into bioplastics.
Materials and Methods: The chemical composition of lignocellulosic waste was determined regarding the cellulose, hemicellulose and lignin content. The structural characterization of lignocellulosic biomass was investigated. The analysis of carbohydrates separated from waste was conducted by high-performance liquid chromatography coupled with an evaporative light scattering detector.
Results: The chemical composition of lignocellulosic waste showed a content of almost 59% carbohydrates. Supercritical CO_2 extraction was applied for cellulose separation. The impact of temperature, moisture and time was evaluated. In order to evaluate the structural modification of lignocellulosic waste, before and after pretreatment at each temperature, SEM imaging analysis was carried out.
Conclusion: In the present research, bioplastics were obtained from lignocellulosic biomass after pretreatment, hydrolysis and microbial fermentation. The study revealed that the temperature played an important role during pretreatment. The renewable bioplastics are suitable to replace the non-biodegradable plastics.

Keywords: Bioplastics, lignocellulosic waste, supercritical extraction.

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INFLUENCE OF THE FREEZE-DRYING PROCESS ON THE COMPOSITION OF DONKEY MILK

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Introduction: Donkey milk has changes under the influence of thermal processes, such as boiling, pasteurization and lyophilization, for fat, protein and lactose. Donkey milk is a beneficial food for the human body, due to its physico-chemical composition. The antioxidant capacity is high, which recommends it in the diet of sensitive people and suffering from various diseases (Coroian et al., 2020). Lyophilization is a method of removing water by sublimating ice crystals from frozen material. Due to the absence of liquid water and the low temperatures necessary for the process, most of the deterioration and microbiological reactions are stopped, which leads to obtaining the highest quality products, better preservation and a high rehydration capacity, in comparison with products dried by traditional methods (Nireesha et al., 2013). The quality of donkey milk powder is influenced by a number of factors. Although, it has a long shelf life, its quality may degrade during storage, due to factors such as: poor quality of the raw material, non-compliance with hygiene practices, non-compliance with the manufacturing technology, handling methods, improper packaging, unfavorable storage conditions. One of the physical changes produced by lyophilization and which is an advantage is the decrease in weight – the volume after lyophilization. The preservation of nutritional qualities by lyophilization of donkey milk is variable depending on the conditions in which lyophilization takes place, so important variations in nutritional value can occur. According to studies, protein losses as a result of the lyophilization process are insignificant. In order to avoid protein denaturation by osmotic shock, a rapid freezing of the product must be carried out. Since proteins are thermolable substances it is recommended to use a temperature as low as possible during the desorption of Lili et al. (2015).

Aims: The purpose of this study is to evaluate the changes that the freeze-drying process makes to the chemical composition of donkey milk.

Conclusion: In this work are highlighted the compositional characteristics for donkey milk after the freeze-drying process. Changes in the content of fat, protein, lactose, fatty acids and amino acids are highlighted.

Keywords: Milk, donkey, lyophilization, chemical composition.

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SESSION 8: VETERINARY MEDICINE - FUNDAMENTAL AND PRECLINICAL SCIENCES

THE PREVALENCE AND MOLECULAR DISTINGUISH OF *BRUCELLA MELITENSIS* REV1 STRAIN AMONG FIELD ISOLATES THE *BRUCELLA* FROM SHEEP AND GOAT MILK THROUGH PCR-RFLP ANALYSIS OF *OMP2* GENE POLYMORPHISM

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Introduction: Brucellosis remain is the main problem in Palestine. Therefore, the present study was undertaking to characterize of prevalence and molecular distinguish of *Brucella melitensis* filed and vaccine Rev1 strains isolated from milk among sheep and goat population.
A study carried out on flocks of sheep and goat suffering from *Brucella* infection outbreaks.
Material and methods: a total 171 of milk samples were collected from different district of the West Bank part of Palestine and isolated on specific *Brucella* agar. Positive 86 cultures were confirmed by standard biochemical methods and screened for *Brucella melitensis* 16M of IS711element by convention PCR technique. All these samples were also amplified for *the omp*2 gene to identify differentiation between field and Rev 1 strains in an infected flock.
Results: the result obtained from *Pst*I restriction enzyme pattern revealed that only 2 (4.5%) samples have specific polymorphism accomplished with *Brucella melitensis* Rev1 strain. Further epidemiological investigation of these flocks indicated that's were recently vaccinated. All other samples were restricted according to *Brucella melitensis* 16M polymorphism pattern and were originated from nonvaccinated flocks.
Conclusion: Despite on adverse effect of *Brucella melitensis* vaccine, only well-organized whole – flock vaccination and awareness campaign may inhibit virulence of field strain and, subsequently, reduce the prevalence of brucellosis infection among animal and human in Palestine. The continues a further investigation of presence *Brucella melitensis* vaccine Rev1 strain in infected flocks is necessary for understanding the epidemiology of Brucellosis.

Keywords: RELP, polymorphism, *Brucella melitensis*

MULTI DRUG RESISTANT *E. COLI* IN WILD UNGULATES IN ROMANIA

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Introduction: *Capreolus capreolus* (roe deer) and *Sus scrofa* (wild boar) are considered overabundant species in Europe. In Romania, these species are widely distributed from low to high altitude. Although, the population size decreased recently, mainly due to infectious diseases such as African Swine Fever, the estimated populations remain high enough to ensure the contact with anthropic areas. *E. coli* is a comensal bacteria of the digestive tract in many animal species and an important opportunistic pathogen. It is considered the most prevalent antimicrobial resistant (AMR) pathogen causing deadly infectious in humans.
Aims: The aim of the present study was to evaluate the spreading of AMR *E. coli* in the wildlife and the possibility to use these as sentinels.
Materials and Methods: A total of 60 faecal samples were collected from wild ungulates in S Ileanda village, Sălaj County, Romania. After cultivation, the *E. coli* isolates were confirmed by 16S rRNA amplification (PCR) and sequencing. The antimicrobial susceptibility testing was carried out using Kirby-Bauer method, using antimicrobials selected based on available EUCAST breakpoints and recommendations.
Results: In total, 26 *E. coli* isolated from 16 boars and 10 deer were tested against 9 AM belonging to different AM classes. All *E. coli* isolates presented resistance to at least 1 AM, 46% or 70% if consider intermediate resistance were MDR and 1 isolate XDR, with resistance to 7 out of 9 drug classes. A highest level of resistance was recorded for aminoglycosides (77%), cephalosporins (70%), monobactams (58%), fluoroquinolones (58%), colistin (42%), tetracyclines (31%), penicillins (23%) and carbapenems (15%), for human use. The lowest level of resistance was observed for Trimethoprim (4%).
Conclusion: The high prevalence of MDR *E. coli* is concerning suggesting the rapid spreading of AMR strains. In addition, the resistance to AM drug classes restricted to human use such as monobactams and carbapenems suggest that resistant bacteria from human population is already spreading into the environment and wildlife representing an important public threat.

Keywords: *E. coli,* AMR, public threat.
Acknowledgement: This research was funded by USAMV CN project 21865/4.10.2021

IN VITRO-STUDY ON CHORIOPTES BOVIS VAR EQUI

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Introduction*: Chorioptes bovis var. equi* produces foot scab in horses, this mite being present most often in the fetlock region in light and heavy horses. The lesions appear at the beginning as a pruritic dermatitis affecting the distal part of the limbs. Initially papules develop and later, alopecia, crusting and thickening of the skin are present. In chronic cases it is possible develop a wet dermatitis, associated with bacterial supra-infections. Normally the signs reduce during the summer but return during the cooler seasons. Untreated, scabies leads always in chronic injuries.
Aims: The objective of this study was the in *vitro* testing of the efficacy of some acaricide molecules (transmethrin, tetramethrin, diazinon, deltamethrin and phoxim) against *Chorioptes bovis var equi* mite collected from four horses.
Materials and Methods: The studies were carried out within the Parasitology and Parasitic Diseases department at the Faculty of Veterinary Medicine in Cluj-Napoca, Romania. For this research four different synthetic molecules were tested to assess the mortality rate in mites. The contact time of the mites with the acaricidal substances was of 72 hours, the efficacy being analised after 24, 48 and 72 hours of contact.
Results and conclusion: After 72 hours the most elevated efficacy (96,5-100%) was achieved at the 0,25‰, 0,5‰ and 1‰ phoxim concentrations, while at 0,3‰, 0,6‰ and 1,2‰ concentrations, diazinon reached a percentage between 93 and 99. Deltamethrin determined a mortality of 84%, namely 96% at the 0,025‰, 0,05‰ and 0,1‰ concentrations, while the lowest efficacy (78% 92%) was at the 1,25‰, 2,5‰ and 5‰ of tetramethrin and transmethrin concentrations.

Keywords: *Chorioptes bovis var. equi*, equine, therapy, veterinary medicine

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BRACHYCEPHALIC DOGS AND ASSOCIATED PATHOLOGIES

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Introduction: The present work is a bibliographic research on the specific characters of dogs of brachycephalic breeds and the associated pathologies, providing details on conformation, constitution and their impact on health. Since the origin of the term "brachycephaly" derives from anthropology and characterizes the cranial calotte, it has been taken over and adapted by veterinary medicine to describe the vault along with the cranial facies. Thus, the length of the muzzle and the cranial shape became primary criteria in the arbitrary framing of dogs in the three breed times, namely: dolicocephalic, mesocephalic and brachycephalic.
Aims: Identification of conformational risk factors, respiratory noises that are considered pathological of nature and do not represent a normality for these breeds.
Discussions: Currently, dogs of brachycephalic breeds, in particular, the French Bulldog, Pug and Boxer, have recorded the greatest popularity around the world. Brachycephalic breeds characterize individuals showing length shortening of cranio-facial anatomical structures, narrow nostrils, elongated and thickened palatine veil, laryngeal sacs and prominent nasopharyngeal turbinates, hypoplastic trachea. The early onset of respiratory distress is due to the incogruence between the cranio-facial bones and the adjacent soft tissues that cause airway obstruction during the breathing process (BOAS). Clinical signs of respiratory pathologies have chronic evolution, and the increased resistance of the upper respiratory tract, during the breathing process, delivery digestive, dermatological, dental and neurological secondary effects.
Conclusion: This research provides evidence on anatomical changes in dogs of brachycephalic breeds that generally have a negative impact on the well-being of life and health.

Keywords: brachycephalic dogs, respiratory distress, health

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KNOWLEDGE ABOUT FOOD INTOXICATIONS IN COMPANION ANIMALS – A QUESTIONNAIRE

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Introduction: Many foods intended for human consumption have been proven to be toxic for companion animals. Sadly, most owners are not aware of the risks associated with feeding their pets simple nutrients such as leek, onion, potatoes, avocados and grapes. One of the few known foods that most owners are aware of as being toxic is dark chocolate, however there are still many cases coming in with such intoxications.

Aims: The aim of this study is to determine the current knowledge of owners in regards to the possibility of food intoxications in their pets and also to determine if the animal health professionals play a role in the education of owners on this subject.

Materials and Methods: This study consists of two questionnaires, one aimed at owners and the other aimed specifically at veterinarians. The questionnaires were generated on Google Forms and distributed to the target audience, based in France as well as Romania.

Results: For the owner questionnaire, 205 responses were received whereas for the veterinarian questionnaire, 50 answers were received. It was noted that owners and veterinarians were unaware of the possible toxicity of both leek and avocado whereas there was some knowledge regarding chocolate. 1 out of 3 veterinarians that responded felt that they were well educated on the matter of food toxicities, while the felt that they were unprepared and would not be able to diagnose eventual toxicities.

Conclusion: Even though there is awareness of certain toxicities, such as chocolate, veterinarians still report alarming numbers of cases that come in. More thorough education of both owners and especially veterinarians should be done in order to evade toxicities that could be preventable.

Keywords: Avocado, chocolate, intoxication, leeks, pets

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PREVALENCE AND MOLECULAR CONFIRMATION OF *LISTERIA* SPP. IN TRADITIONAL DAIRY PRODUCTS IN ROMANIA

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Introduction: The presence of Listeria genus bacteria and in particular of the pathogenic species holds the strict attention of the health authorities. Although the incidence of listeriosis is much lower than that of other foodborne zoonoses, it remains worrying because of its seriousness and its great resistance, making the fight for eradication very difficult.
Aims: The aim of this study was to establish the prevalence of *Listeria* spp. in dairy products sold on the traditional market and to assess the potential risk for public health.
Materials and Methods: In order to reveal the prevalence, we have collected 78 samples of dairy products from the traditional markets, as it follows: 32 samples of raw milk, 28 samples of fermented cheese and 10 samples of fresh cheese. The samples were processed by classical isolation protocol for *Listeria* spp. and the colonies confirmed by PCR with primers specific for *Listeria monocytogenes*, *Listeria ivanovii*, *Listeria innocua*.
Results: The molecular protocol adapted for this study has successfully revealed the presence of specific strains of *Listeria*. We found one sample positive for *Listeria monocytogenes* in DNA extracted from a raw milk sample and 12 samples positive for *Listeria innocua*. None of the samples revealed the presence of *Listeria ivanovii*. Another study carried out recently in the same region of study as us, namely the Transylvania, showed a higher incidence (6.8%) for *Listeria monocytogenes* in raw cheese products (Tîrziu et al., 2022).
Conclusion: Raw milk dairy products processed in the traditional system might represent a risk for public health given that one of the samples was found positive for the pathogenic strain. We recommend a strict surveillance for these bacteria to be applied mandatory in all processing stages of raw dairy products.

Keywords: Raw milk, Listeria spp., PCR.

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BODY CHARACTERISTICS, PERFORMANCES AND PROTEIN METABOLISM IN HY-LINE BROWN HENS SUBJECT OF NATURAL MOULT

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Introduction: Despite of the high selection pressure and the application of strict light programs (controlled photoperiod), the phenomenon of natural moult is still quite common in the industrial breeding systems of ultra-specialized laying chicken hybrids. The process of spontaneous moult deeply affects the physiological state of the chickens, its detailed knowledge can help the breeders in avoiding its negative economic effects.
Aims: The aim of this paper was to investigate the particularities of the spontaneous moult process in the egg-laying hybrid Hy Line var Brown.
Materials and Methods: Two groups of 63-week-old Hy line var Brown hens were used in the experiment: a group of naturally sheared hens and a control group of non-sheared hens. Both groups were fed *ad libitum* on a commercial diet, had free acces to water and benefited of the same lighting program of 15 hours and 30 minutes The experimental surveillance was carried out for a period of eight weeks, until the resumption of laying. Feed intake, body weight, serum total protein, albumin, globulins, uric acid and total manure nitrogen were weekly determined.
Results: Spontaneous moult of the 63-week-old Hy-Line var. Brown hybrid is characterized by a decrease in food intake by up to 35.0%, a decrease in body weight by up to 31.6%, a significant increase in mortality (1.45 vs. 0.66% in un-moulted control) by stopping the laying process, a decrease by 67.2% in the weight of the ovary and 54.3% of the weight of the oviduct. The serum level of uric acid was increased during the period of massive moult revealing a high protein catabolism. Total nitrogen manure was decreased during the period of massive moult, a fact attributed to the decrease in food intake. Eight weeks after the onset of the spontaneous moulting process, the reported changes are no longer significantly different from those of un-moulted hen.
Conclusion: The spontaneous moult process in Hy Line var hens. Brown unfolds over a period of about eight weeks and is dominated by increased protein catabolism, a consequence mainly of spontaneous decrease in food consumption.

Keywords: laying hen, metabolism, natural moult.

EVOLUTION OF SOME MORPHO-HEMATOLOGICAL PARAMETERS DURING THE PROCESS OF SPONTANEOUS MOULT IN HY-LINE BROWN HENS

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Introduction: The hen is one of the species whose mechanism of moult is little known, being relatively different from those raised in the wild or those raised in a controlled system. Bread differences are also signaled and analyzed. The moult process involves profound physiological transformations, including hematological profile.
Aims: The purpose of this paper was to determine the evolution of the main morpho-hematological parameters in Hy-Line var. Brown hens, which supported a natural moult process.
Materials and Methods: A control group that did not show signs of moult and an experimental group of spontaneously moulting hens were set up. Blood samples were collected weekly, from 63 (age of the starting of the moult) to 70 weeks of age (when the laying resumes. Red blood cell number (RBC), hematocrit (PCV), haemoglobin (Hb), leukogramme, mean corpuscular volume (MCV), mean corpuscular haemoglobin (MCH) and mean corpuscular haemoglobin concentration (MCHC) were determined.
Results: The moulting group presented a decrease of RBC (-24.8% in the first week of moult) ($P<0.05$), then RBC increased again, in weeks 4 to 8 of moult. PCV decreased (-17.2% in the first week then started to increase again. For Hb, the differences between the moulted group and the control group were significant ($P < 0.05$) from one to three weeks of moult. In the first week, Hb was -6.4% lower than in the control. MCH, MCV and MCHC indicate a status of relative hypochromic anemia. An increase of the lymphocytes and monocytes percents was fount during the period of intensive moult of the first three weeks of the monitored period ($P = 0.011$), followed by a decrease in the next five weeks of monitoring.
Conclusion: Blood morpho-haematological parameters during the moult process show a specific dynamic, dominated by a decrease in the number of RBC, PCV and Hb, on the one hand, and a decrease in the percentage of lymphocytes on the other. These changes take place predominantly in the first three weeks of the moult period.

Keywords: hematology parameter, hen, spontaneus moult.

HISTOCHEMICAL EVALUATION OF MUCIN-SECRETING CELL ACTIVITY IN THE STOMACH OF THE WISTAR RAT

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Introduction: Mucin plays a very important role in the physiological function of the stomach in all species, but the representation of mucin-secreting cells differs from species to species.
Aims: The aim of this study was to highlight these cells in the stomach of the Wistar rat.
Materials and Methods: For histological investigations, fragments of the stomach from the three main regions (cardiac, fundic and pyloric) were harvested from four Wistar rats and further stained with PAS and Alcian blue methods.
Results: The histochemical results showed the presence of mucin-secreting cells in the examined tissues. An intese PAS positive reaction was found in the surface epithelium cells of the gastric mucosa and in the cells lining the gastric crypts in all the three segments. In the deep glandular structures, the cells of the cardiac and fundic glands are PAS negative, while those of the pyloric glands are all PAS positive. For Alcian blue reaction, the cells lining the gastric mucosa and the crypts in the three regions of the stomach were negative. In the glands, the cells of the cardiac and fundic glands were Alcian negative while in the pyloric glands, a limited number of cells arranged in the deep third of the glands showed a weak positive Alcian reaction.
Conclusion: The vast majority of glandular cells in the rat's stomach do not synthesize acidic mucins, except for cells in the deep part of the pyloric glands, which synthesize small amounts of such mucins.

Keywords: histochemistry, mucin, rat, stomach

YERSINIA ENTEROCOLITICA A NEGLECTED PATHOGEN AND ITS RESISTANCE TO ANTIMICROBIALS

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Introduction: *Yersinia enterocolitica*, Gram-negative coccobacillus, is primarily an enteric pathogen in many animal species, and occasionally may produce extra intestinal infections. In humans, *Y. enterocolitica* is a foodborne pathogen being involved in several major outbreaks in the US and Europe. According to EFSA it is the third-most-common enteropathogen reported. Nowadays, *Y. enterocolitica* is considered an emerging pathogen with an increasing antimicrobial resistance (AMR). AMR strains of animal origin were recently reported in western and central Europe.
Aims: The aim of the present study was to evaluate the prevalence of *Y. enterocolitica* in the wildlife, its susceptibility to antimicrobials and the possibility to use wild species as sentinels.
Materials and Methods: A total of 60 faecal samples were collected from wild ungulates in Ileanda Village, Sălaj County, Romania. After cultivation, the *Y. enterocolitica* isolates were confirmed by PCR targeting 16S rRNA followed by DNA sequencing. The antimicrobial susceptibility testing was carried out using Kirby-Bauer method, using antimicrobials selected based on available EUCAST breakpoints and recommendations.
Results: In total, 11 *Y. enterocolitica* were recorded in deer (37%) and one in a wild boar (3%). The 12 isolates were tested against 9 AM belonging to different AM classes. Half of the *Y. enterocolitica* isolates presented resistance to at least 1 AM. The observed resistance was against Amikacin in 2 isolates and Piperacillin in 1 isolate. In addition, 5 isolates were intermediate resistant to Aztreonam and 1 to Cefotaxime, both critical antibiotics restricted to human use.
Conclusion: The high prevalence of *Y. enterocolitica* in roe deer suggest that this species may be reservoir of yersinosis. The high percent of resistant strains compared with other European strains is concerning. In addition, the resistance to β-lactam antibiotics restricted to human use suggests that resistant bacteria from human population is already spreading into the environment representing an important public threat.

Keywords: *Y. enterocolitica,* AMR, public threat

Acknowledgement: This research was funded by USAMV CN project 21865/4.10.2021

RESEARCH ON AVAILABLE PHOSPHORUS REQUIREMENTS IN RED-MINI-ROCK HENS FED ON DIFFERENT CEREAL-BASED DIETS

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Introduction: The available phosphorus levels in the diet of laying hens must be constantly adapted to their nutritional requirements. A reconsideration of dietary phosphorus levels can be an option to better meet the dietary requirements of the species according to laying needs.
Aims: The aim of our paper was to determine the effect of wheat and maize-based feeding diets combined with different levels of phosphorus supplemented in the form of mono- and dicalcium phosphate on the main properties of the ggs in Red-Mini-Rock hens.
Materials and Methods: The research was performed on a control and six experimental groups of 33-week-old hens. The experimental feeding lasted 5 weeks. A control and three experimental diets based on wheat and three experimental diets based on maize were formulated. The diets differed in the level of digestible phosphorus supplementation, which was 4.5, 3.0 and 1.5 g/kg DM of forages. Feed intake, laying performances, shell properties, and egg internal properties were monitored.
Results: The different levels of phosphorus in the diets have significantly changed certain productive parameters of the laying hens. Feed intake was significantly higher in all maize-based diet fed groups compared to wheat-based diet fed groups. The egg shell thickness and weight values were higher in the groups fed on higher phosphorus-enriched diets than those that consumed less phosphorus-enriched diets. The egg strength was statistically significantly higher in maize-enriched diet fed groups vs. control, while in the case of the groups fed on wheat-enriched diets, the egg strength remained statistically unchanged.
Conclusion: Research into the effect of wheat-based or maize-based diets with varying levels of available phosphorus has specifically improved some of the properties of eggs in laying hens. The effects are the result of a combined interaction between the basic components of the diet and the level of phosphorus supplementation.

Keywords: diet composition, egg properties, laying hen, phosphorus supplementation.

THE EFFECTS OF CANNABIDIOL OIL ON CANINE EPILEPSY AND ARTHRITIS -A CASE STUDY

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Introduction: Cannabidiol oil has gained notoriety in recent years due to its effectiveness as an adjuvant therapy in many pathologies, most notably in epilepsy as an anti-epileptic drug and in arthritis as an anti-inflammatory and analgesic agent.
Aims: The purpose of this study is to evaluate the chronic effects of CBD oil in the treatment of pain and the associated pathologies of epilepsy and arthritis, on a single subject, species – canine, race – Labrador, sex – female, age – 12.5 years old at the beginning of the study.
Materials and Methods: The therapeutic protocol used in the study was the administration of CBD oil orally, sublingually, in doses of 2.25 mg/kg. The dose was administered daily and the animal was monitored throughout the study for pain and epileptic crises. Hematology and biochemistry were performed at 3, 6 and 12 months. Radiology was performed before the study began and after 12 months. All investigations were performed at USAMV Cluj-Napoca.
Results: After the first month of treatment, a decrease in the number and severity of epilepsy crises was observed. Beginning with the first 2 weeks of CBD oil administration, the patient was already experiencing an improvement in her mobility along with general pain remittance and the amelioration of her 3rd degree lameness, quantified by the Colorado Pain Scale and clinical monitorization. After 5 months of complementary therapy with CBD, phenytoin therapy was ceased due to liver problems. After 8 months of CBD treatment, phenobarbital was excluded from the therapeutic protocol, thus making CBD an independent therapeutic molecule.
Conclusion: CBD can be administrated as complementary or alternative therapy, over a long period of time, with outstanding results in regards to epilepsy and arthritis, subject to an adequate monitoring of the patient as well as the appropriate use of medication in the event of severe epileptic crises or systemic pain.

Key words: arthritis, CBD, cannabinoids, epilepsy, pain management

A CASE REPORT: IMMUNOHISTOCHEMICAL EVALUATION OF AGONAL THROMBUS IN A HORSE

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Introduction: The phenomena of agonal thrombosis is rarely studied in the pathological field both in humans and animals. It is known that thrombosis takes place during the lifetime of the animal, while cruors are the result the post-mortem blood coagulation. The agonal thrombi appear different from the aforementioned, being present in the cases of agonal death preceded by a long period of agonal suffering.
Aims: Immunohistochemistry is being used as laboratory investigation in order to differentiate agonal thrombi from cruors or vital thrombi. Thus, the markers of agonal thrombosis can be used in forensic pathology as differentiation features to exclude the occurrence of sudden death.
Materials and Methods: The present case report is a 34-year-old male horse registered for necropsy by a private owner. It has been reported that a long period of agony occurred prior death. Standard necropsy was performed alongside routine histopathology and immunohistochemistry using antibodies for CD45 (lymphocytes), CD61 (platelets), CD68 (monocytes/macrophages), Von Willebrand factor and fibrinogen.
Results: Agonal thrombi were found in all the chambers of the heart, with a firm consistency and pale-reddish coloured. Areas of fibrin were found in the agonal thrombus in routine histopathological examination, while the immunohistochemistry showed a strong positive response to the fibrinogen and platelets markers. The testing for lymphocytes, macrophages and Von Willebrand factor showed little to no response.
Conclusion: The presence of fibrinogen, fibrin and platelets demonstrate that the agonal thrombus was formed during the animal lifetime, while the lack of response to CD45, CD68 antibodies prove that death occurred at short time after the initiation of coagulation process.

Keywords: agonal thrombus, agonal death, sudden death

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EVALUATION OF THE VENOUS SYSTEM OF WISTAR RAT LIVER BY INJECTION WITH EPOXY RESIN

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Introduction: The rat is the most widely used experimental model in surgical research because of several factors, among which are the fact that it is easy to handle and inexpensive. It can be used in investigations related to liver regeneration, liver metastasis, transplant immunology or liver disease.
The aim of this study was to highlight the venous components of the hepatic circulation in the Wistar rat by intravascular injection of a polymer that allows the distribution of vessels to be assessed regardless of their calibre.
Material and methods: Five cadavers of 11-month-old male Wistar rats from the USAMV Cluj-Napoca biobase destined for incineration were used to highlight the liver venous system. A dye mixture, consisting of epoxy resin-catalyst-blue acrylic dye in a 2:1:1 ratio, was injected. After 24 hours, biological tissues were macerated by immersion in 10% KOH solution for five days.
Results: The intrahepatic venous system is represented by the venous branches that continue into the liver lobes and follow a parallel course with the hepatic artery branches, being represented by right and left tributaries. The right branch of the portal vein presents tributaries to the lateral and medial parts of the right lobe of the liver and to the caudate lobe. The left branch of the portal vein has tributaries for the lateral and medial parts of the left lobe and for the quadrate lobe.
Conclusions: The technique of injecting the venous circulation of the liver, followed by tissue maceration, allowed the removal by anatomical dissection of all liver components and the very sharp highlighting of all components of the venous system, from the largest to the finest.

Key words: epoxy resin, venous system, Wistar rat.

THE DESCENDING AORTA: EVALUATION OF BRANCHES BY DISSECTION AND EPOXY INJECTION

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Introduction: Information regarding the size and distribution of the branches of the descending aorta is very important in surgery and especially microsurgery research of the organs, served by the branches of the aorta.
Aims: Obtaining the most accurate and precise information about the branches of the descending aorta, which serve different organs of the abdominal cavity and lower part of the body.
Materials and Methods: 5 Wistar rats were injected with epoxy resin in combination with acrylic dye through a catheter inserted into the initial portion of the descending aorta. After 48h the resin hardened and allowed very clear dissection of the descending aorta and its branches.
Results: The descending aorta was well highlighted along its entire length, and also the origin of the arteries that branch off from it to vascularize the organs of the abdominal cavities could be precisely appreciated. The following arteries: celiac artery; higher and inferior mesenteric arteries; renal arteries; left and right common iliac artery, were highlighted through their entire length, from their branching from the aorta until their entrance into the organ they supply. The dissection was significantly favored because this mixture of resin and acrylic dye ensured the arteries both consistency and elasticity.
Conclusion: Used substances proved to be very suitable for intravascular injection in terms of both fluidity and the temperature at which it was administered, aspects that allowed its penetration to the finest branches. Consistency and elasticity of the arteries after hardening of the injected mixture allowed a very easy and high-precision anatomical dissection.

Keywords: Abdominal aorta, microcirculation, resin injection, vascular casting.

SESSION 9: VETERINARY MEDICINE - CLINICAL SCIENCES

ESTABLISHING A MURINE OSTEOPOROSIS PROTOCOL FOR BIOMATERIALS TESTING

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Introduction: Osteoporosis is one of the most common disorders of bone metabolism, this being a condition that causes pain, affects the bone system, frequently causing fractures, as a result of the reduction of bone mass and density.
Aims: The purpose of this study is the establishment and testing of an experimental protocol to induce osteoporosis in laboratory rats, osteoporosis being induced by ovariectomy. It is desirable that osteoporosis is successfully induced so that various biomaterials for treating osteoporosis can be further tested. The study was conducted in the authorized Laboratory Animal Facility (University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca).
Materials and Methods: For this study, 20 Sprague-Dawley rats, 8 months old, were used, 15 were split into 3 groups of 5 individuals, which were then operated, while the last 5 were left control group. 4 months after surgery, biochemistry analyses were determined in order to see progesterone level, calcium, alkaline phosphatase and phosphorus. Osteodensitometry was also determined by CT – scanning to compare the differences between the ovariectomized group and the control group.
Results: Biochemistry revealed that progesterone level was decreased by ~40-60%, calcium values were decreased, alkaline phosphatase was increased and the Ca:P ratio was altered. Also, the analysis of bone densimetry (BMD) revealed a decreased bone density in the ovariectomized group compared with the control group.
Conclusion: In conclusion, osteoporosis by means of estrogenic deficit, was successfully induced in 8-month-old *Sprague-Dawley rats*.

Key words: osteoporosis, ovariectomy, bone densimetry, biochemistry, biomaterials

PREVALENCE OF SWINE DIGESTIVE PARASITES IN TWO FREE-RANGE FARMS FROM TRANSYLVANIA AREA

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Introduction: Parasitic diseases cause significant economic losses in swine. In the last decade, an increase in the number of free-range swine farms was noticed in Romania.
Aims: The current study aimed to identify the parasitic profile of swine raised in two free-range (low-input) farms from Transylvania.
Materials and Methods: A number of nine hundred sixty samples were collected from weaners, fatteners, and sows. The coproparasitological examination was performed using the following methods: flotation, active sedimentation, modified Ziehl-Neelsen stained fecal smear, modified Blagg technique and oocysts/eggs cultures. The number of cysts (CPG), oocysts (OPG), and eggs (EPG) were counted per gram of fecal matter.
Results: The examination revealed parasitic infections with *Balantidium coli*, *Eimeria* spp., *Ascaris suum*, *Trichuris suis*, *Oesophagostomum* spp., *Strongyloides ransomi* and *Cryptosporidium* spp. Prevalence (P) and the average intensity (AI) of the infections varied according to swine category, season, and farm. The overall prevalence in both free-range farms according to the age category was 63.2% - *Eimeria* spp., 70.31% - *B. coli*, 9.38% - *Oesophagostomum* spp., 3.75% - *S. ransomi*, and 18.12% - *Cryptosporidium* spp. in weaners. In fatteners *Eimeria* spp. revealed a prevalence of 50.93%, *B. coli* - 72.5 %, *A. suum* - 63.13%, *T. suis* - 39.06% and in sows *Eimeria* spp. - 39.06%, *B. coli* - 62.19%, *A. suum* - 34.06%, *Oesophagostomum* spp. - 27.19%, *S. ransomi* - 1.56% and *Cryptosporidium* spp. - 9.38%.
Conclusion: Furthermore, the present study revealed statistically significant differences between age groups, seasons, and farms for all diagnosed parasites. However, further research is required for a better understanding of the epidemiology of these infections in swine from Transylvania.

Keywords: Digestive parasites**,** epidemiology, free-range farms, swine

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AFRICAN SWINE FEVER VIRUS LOAD IN HEMATOPHAGOUS DIPTERANS COLLECTED IN OUTBREAKS FROM ROMANIA: RISK FACTORS AND IMPLICATIONS

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Introduction: African swine fever (ASF) is a highly contagious viral disease of suids that causes significant economic damage. The summer peaks and river courses have triggered the hypothesis that vectors may be involved in the transmission of the virus.
Aims: The aim of our study was to evaluate the risk factors associated with the presence of ASFV DNA in hematophagous dipterans and to analyze the relevance of Ct values of the positive samples in ASF outbreaks in Romania, as an indication for the viral load.
Materials and Methods: The current study included 99 pools of stable flies (*Stomoxys calcitrans*) and 278 pools of biting midges (*Culicoides* spp.), collected in June-September 2020, from 30 outbreaks of ASF in domestic swine from backyard farms (BF), type A farms (TAF) and commercial farms (CF). All extracted DNA was tested for the presence of ASFV genome using a real-time PCR protocol. Ct values of 39.53 and below were considered as positive. The blood meal source was identified in the hematophagous insects by using a PCR protocol targeting the mitochondrial gene cytochrome c oxidase subunit 1. Data were analyzed using R software v. 4.0.5.
Results: In total, 2978 insects (*S. calcitrans* n= 198 and *Culicoides* n=2780) were collected in 19 outbreaks out of the 30 sampled farms. Ten species of biting midges were identified. The total number of insect pools showed significant differences according to the month of sampling, with a higher number of pools collected in August and September. Overall, 137 pools out of the 377 examined were positive for the presence of ASFV DNA.
Conclusion: There was a higher viral DNA load in farms where pigs were present at the moment of sampling compared to farms where pigs were already culled, in *S. calcitrans* compared to *Culicoides* spp. and in CF and TAF compared to BF.

Keywords: African Swine Fever virus, *Culicoides*, cycle thresholds, RT-PCR, *Stomoxys calcitrans*

GOOD PRACTICES FOR PRUDENT USE OF ANTIBIOTICS IN ROMANIAN DAIRY FARMS

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Introduction: Implementation of tools and programs to reduce antibiotic use in the dairy sector has been a major objective of projects focused on innovative research to fight antibiotic resistance (Poizat *et al.*, 2019; DISARM, 2022).
Aims: Highlight of good practices for prudent use of antibiotics applied in Romanian dairy farms.
Materials and Methods: Multi-actor farm health plans (MAFHP), "Danish stable" schools (DSS), reports of national and international cross visits, and feedback of multi-actor farm health teams (MAFHT) developed in the DISARM Project by Romanian dairy farms were analysed.
Results: MAFHPs and DSSs focused on improving farm conditions to improve farm health. To avoid misuse of antibiotics, all dairy farms benefited from the assistance of the farm's veterinarian and the MAFHT. The dairy farms included in this study used antibiotics only for the treatment of primary and secondary bacterial diseases.
Conclusion: In Romania, good practices for prudent use of antibiotics are focused on the use of the right antibiotics, at the right time, in the right dose and duration.
Acknowledgements: DISARM has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No 817591.

Keywords: AMR, best practices, dairy farm innovation, prudent use of antibiotics

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REDUCING THE CONSUMPTION OF ANTIBIOTICS IN ROMANIAN DAIRY FARMS: WHY IS COLOSTRUM PERIOD SO IMPORTANT TO THE NEW-BORN CALF?

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Introduction: The inability of ruminants to transfer immunoglobulins across the epitheliochorial placenta results in the immune naive state of new-born calves (DISARM, 2022). Passive transfer of colostrum immunoglobulins in the first hours of life can prevent calf pathology (Furman-Fratczak *et al.*, 2011; Gomez *et al.*, 2017).
Aims: Analysis of the first three days postpartum period in the susceptibility of calves to infections.
Materials and Methods: Published studies were reviewed for evidence of prevention of calf pathology by passive transfer of large amounts of colostrum immunoglobulins during the first hours of life.
Results: In the calf's strong immunity and effective protection against neonatal diseases, several factors are involved. The quantity of colostrum at the first meal, colostrum Brix value, and period of time when new-born calves received colostrum after birth can influence the odds of adequate transfer of passive immunity and the incidence/severity of neonatal calf pathology. Also, the colostrum immunoglobulins may be an indicator of subsequent growth and production of future dairy cows (e.g., reduction of culling rates, reduction of the age at first service, and increase in lactational performance).
Conclusion: All dairy farms must implement a colostrum management protocol to ensure that the new-born calf has absorbed sufficient antibodies during the colostrum period.

Keywords: AMR, best practices, colostrum period, calf pathology

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INFLUENCE OF BREED OF BOARS ON PRODUCTION RESULTS

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Introduction: In intensive pig production on commercial farms, it is strived to produce as many weaned piglets per sow per year as possible. To achieve such production results, it is necessary to establish a high reproductive efficiency of breeding animals. Artificial insemination obtaining many quality piglets from a relatively small number of purebred boars. It also prevents the transmission of coital infections, increases labor productivity, and reduces production costs. The quality of boars' semen impacts the reproductive results, but other factors may be involved. Monitoring in reproduction is an essential part of farming technology.
Aims: This research aimed to determine the influence of boars' breed on reproductive results.
Materials and Methods: Production results of Yorkshire, Dutch Landrace, and Duroc boars have been monitored on a commercial pig farm by the following parameters: abortions, farrowing rate, and the number of piglets in the litter. One-factor ANOVA and Fisher LSD test were used to determine the influence of boar breed on the results.
Results: The average abortion rate was 7.03% and the farrowing rate was 86.62%. The average number of piglets in the litter was 14.78. There was no significant influence of boar race on these results ($P = 0.07$).
Conclusion: The boars' race showed no influence on these results, other factors have been involved.

Keywords: boars, commercial farm, productivity

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FREE RANGE VERSUS TIE-STALL SYSTEM INFLUENCES THE SPECIFIC CELL-MEDIATED POST VACCINATION RESPONSE IN COWS

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Introduction: Vaccination strategies in cattle provide suitable control of certain infectious diseases, where the specific cell-mediated response holds an important role. The vaccination procedure not only ensures the adult cos's health but also contributes to new-born protection and enhances disease eradication.
Aims: The current research aimed to evaluate the influence of tie-stall and free range systems on the *in vitro* specific cell-mediated response as a measure of vaccination success in pregnant cows.
Materials and Methods: Two groups of tie-stall and free-range Romanian Spotted cows (n=10) were vaccinated during their last period of pregnancy against bovine rotavirus and coronavirus and enterotoxigenic *Escherichia coli*. Blood from each animal was drawn before, 2 and 6 weeks post vaccination and subjected to the *in vitro* blastogenic test by mitogen, plant extract and vaccine antigen stimulation. Enhanced cell growth was estimated by a glucose consumption test.
Results: The data demonstrated the *in vitro* differences in post-vaccination immune responses in tie-stall and free range dairy cows. Six weeks after the vaccination, the free-range cows better responded to the *in vitro* treatments, independently on the stimuli, thus, supposedly their antibody titers transmitted through the colostrum would be high enough to provide adequate protection for the neonates.
Conclusion: The data suggested the usefulness of the free range raising system as a measure to increase the mothers' immunity level in order to ensure the protection of the new-born. The vaccine administration in cows to protect neonates should be considered at least six weeks before the parturition. The important stimulating effect of the peppermint alcoholic extract suggested its potential use as an adjuvant in increasing the post-vaccination immune response in pregnant cows.

Key words: cattle, immune system, vaccination, neonatal calf diarrhea.

A SYSTEMATIC REVIEW ON THE DISTRIBUTION OF THE *THELAZIA* GENUS IN ROMANIA

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Introduction: Thelaziosis is an emerging zoonosis in both Europe and Asia. While *T. callipaeda* has been the focus of many reports in the past two decades, several studies underlined the presence of *T. lacrymalis* as well as *T. skrjabini*, *T. gulosa* and *T. rhodesi* in livestock and wildlife. There is limited data on the distribution of the genus and its hosts in Romania, therefore posing a significant public health risk.
Aims: The aim of this study is to assess the presence and distribution of *Thelazia* spp. in Romania and compare them to those reported in Europe.
Materials and Methods: 77 studies (15 on *T. callipaeda* in wildlife, 33 on *T. callipaeda* in domestic animals, 8 on *T. callipaeda* and *T. gulosa* in humans, and 31 on *Thelazia* spp. in livestock) on the presence and distribution of the genus were analyzed and compared. Maps were created using the QGiS 3.20 software.
Results: Prevalence values varied between 1.82% and 29.4% in Romania for *T. callipaeda* in wildlife, with no quantitative reports in domestic animals. *T. rhodesi*, *T. gulosa*, *T. skrjabini* were rarely reported on, with a prevalence of 19.87%. *T. lacrymalis* was only recently reported on in Romania (study pending review). A strong contrast can be observed between prevalence levels from Romania and those from the rest of the continent.
Conclusion: The current study expands on the known prevalence levels of *Thelazia* species in domestic animals and wildlife. It also reiterates the necessity of comprehensive and quantitative studies, on the genus and its hosts, in order to understand and prevent the further spread of the disease, in both humans and animals.

Keywords: Thelaziosis, *Thelazia callipaeda*, *Thelazia gulosa*, vector borne nematodes, Romania

OBTAINING CAPONS FROM SELF-SEX HYBRID COCKS FOR THE EVALUATION OF THEIR MEAT QUALITY

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Aims: We designed an experimental model to observe the effects of flapping on self-sexing Rhode Island Red–Playmouth Rock-barred hybrid chickens.
Materials and Methods: To obtain autosexable hybrid chicks, we used females from the Playmouth Rock breed that we crossed with males from the Rhode Island red breed, thus the chicks obtained through artificial incubation at one day had distinctive morphological characters between the sexes. The autosexable male hybrid chickens were raised in a traditional (extensive) system, thus a good development of them was observed, manifesting the phenomenon of heterosis. At the age of 3 and a half months, before reaching sexual maturity, they were subjected to flapping by the method with lateral approach to the testes on one side using a human tonsillatome. In a few roosters, enucleation of the testes by squeezing with the help of the fingers was done with the same result. They had a 100% survival rate. After castration, the group of castrated roosters, together with the group of non-castrated roosters, were raised in the same environmental and feeding conditions, observing if morphological or weight differences appear.
Results: The roosters from the two lots were slaughtered at the age of 7 and a half months, looking for quantitative and qualitative differences in their carcasses. The average weight of castrated roosters was higher than the control group of uncastrated roosters. Castrated roosters had an average weight of 3.3 kg, versus non-castrated roosters which weighted around 3.0 kg. Their carcasses had a weight of 2.5 kg in the case of the castrated ones and 2.2 kg in the case of the non-castrated ones.
Conclusion: During the visual examination of the carcasses, it was noticed that the skin of the castrated roosters had a more intense yellow color, while on section the thigh muscles had a lighter color (light red) compared to the color of the thigh muscles of the non-castrated roosters, which was much darker. Also, the consistency of the muscle in the non-castrated roosters group was much stronger.

Keywords: rooster, capon, flapping, self-sex chickens, traditional system

THE VETERINARY MANAGEMENT ON CATTLE FARMS

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Introduction: On farm livestock administration is based on reducing negative external influences and improving the sustainability and productivity of the management systems, which becomes a priority in the animal sector.
Materials and Methods: A tailored veterinary management program was implemented during January until June within a private cattle farm located in a hilly region with temperate climate,. This program was developed on a thorough analysis of the data existent within the farm over 2011-2014, data which are listed in documents such as: the register of cattle insemination, the register of births, the register of milk production control, the register of on-farm drug consumption, the clinical register, the register of mortalities. In order to implement this program, the following types of management were used: through objectives, through product, through delegation, through budgets.
Results: The implemented management program reached economically important domains, with immediate impact on clinical and economical health: reproduction management, management of mastitis and milk production, nutrition management, management of shelter hygiene, epidemic management, management of pharmacological products. Subsequent to the program use, a progress was recorded for all economic indexes of the farm and a slight improvement of the clinical health of on-farm cattle was recorded, as it resulted from the study outcomes: a decrease in calving interval index by 2,21%, a diminish of mortality for the category 0-6 months by 16%**,** decrease of the number of cows with mastitis by 12%**,** next step its creating a management information system of data related to the animals' health state.
Conclusion: The encountered results not only showed economic and sustainability increase of the farm but also validated the management program implemented and indicated it should be adapted to each and every farm's requirements.

Keywords: cattle health, information systems, management, progress

AN INSIGHT IN THE ANTIBACTERIAL CAPACITY OF BEE PRODUCTS

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Introduction: The antimicrobial activity of bee products has been researched and exploited medicinally for many years (Boorn et. al. 2009). Phenolic compounds with antioxidant, antibacterial, antiviral, anti-inflammatory capacities are the mainly responsible for the functionality of numrous foods (Viuda-Martos et. al, 2008).
Aims: The polyphenol content and the antioxidant effects of three types of honey: acacia, rapeseed and polyfloral honey and propolis were monitored.
Materials and Methods: All acacia, rapeseed and polyfloral honey were used as such and propolis was diluted to two different concentrations of 20% and 30%. The antioxidant capacity was evaluated by assessing free radical scavenging effect over 1,1-diphenyl l-2-picrylhydrazyl radical, using DPPH method, while Folin-Ciocalteu method was implemented for assessment of total polyphenols.
Results: Out of honeys, the highest antioxidant capacity (31.03%) was identified for the rapeseed honey; nevertheless, it was much lower than that of 20% propolis (94.06%). The total phenolic content was the highest in acacia honey (252.03 mg GAE/100 g), still lower than that of 20% propolis (344.29 mg GAE/ 100g).
Conclusion: The present study revealed differences in bee honey and propolis antioxidant properties. The total phenolic content and total antioxidant capacity were significantly higher in propolis than in honey, suggesting a higher antimicrobial potential for the latest.

Keywords: antioxidant, honey, polyphenols, propolis.

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ANTIMICROBIAL SUSCEPTIBILITY OF BACTERIA ISOLATED FROM SHEEP NECROBACILLAR PODODERMATITIS

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Introduction: Footrot caused by interaction of *Dichelobacter nodosus* and *Fusobacterium necrophorum*, is complicated by the presence of the bacterial community of the hoof (Beveridge, 1941). The economic losses, galloping spread within the herd and high morbidity converged the attention on prevention rather than on disease treatment (Kennan et al., 2011).
Aims: A comparison of the level of antimicrobial susceptibility to the most common antibiotics used in the same herd was performed in diseased and convalescent sheep.
Materials and Methods: Samples were taken from 15 sheep (n=10, diseased, n=5 convalescent). Standard microbiological methods and quick identification tests (GN24, GP24, ENC 8) were used. Diffusion method was applied to quantify the resistance levels to: AMC, P, IPM, GEN, S, FFC, CEQ, E, TY, TUL, OT and DO.
Results: *E. coli* dominated in 30% of the sheep, while *Pseudomonas* spp. was observed in 15% , along with bacteria from *Acinetobacter*, *Aeromonas, Kocuria* and *Facklamia* genera. 65%, 50%, 40% and 35% of the strains were resistant to tylosin, penicillin, erythromycin and oxytetracycline, respectively.
Conclusion: The high percentage of identified resistance to tylosin was a consequence of its use as a growth promoter, while for the other antimicrobials the results support their irrational and frequent administration in various pathologies not only footrot (Marshall et al., 2022).

Keywords: antibiotic resistance, bacteria, necrobacillosis

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BIOLOGICAL EFECTS OF TULATHROMYCINE ADMINISTRATION IN SHEEP: CLINICAL AND HEMATOLOGICAL STUDY

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Introduction: Tulathromycin is an antibiotic used in the treatment of respiratory infections in cattle and pigs. The European Medicines Agency declares that it can be efficient also in the metaphylaxis of these pathologies.
Aims: The purpose of this study is to test the safety and effectiveness of the use of tulathromycin in ovine youth based on the lack of enough information about its use as an antibiotic or immunomodulator at sheep.
Materials and Methods: The study was performed on 12 sheep, breed Turcana, 1.6 years old, divided in 4 equal groups (n=3). The first two groups received a dosage of 2.5 mg/kg s.c, respectively i.m. One group received 7.5 mg/kg i.m and the last group a dosage of 12.5 mg /kg. Before administration, at 24 h, 7, 14 and 21 days, clinical assessment was performed, monitoring body weight and temperature. Also, blood haematological analysis was performed in order to determine the systemic non-specific immune response.
Results: Following subcutaneous injection, the formation of a local edematous reaction was observed, which resorbed after 2-3 days. No significant statistical changes were identified in terms of body temperature, but the weight of the animals varied, a decrease between 2.4 and 14.4% was observed in groups 1 and 3, respectively. Most probably, these are determined by environmental conditions and access to food. The hematological parameters showed an increase in lymphocytes after 24 h of administration, during the rest of the time periods the hematological values were within the limits of the species.
Conclusion: The intramuscular route of administration of tulathromycin in sheep is considered optimal due to no negative clinical or hematological consequences.

Keywords: tulathromycin, sheep, safety study, immunomodulation

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The European Commission, 2016, Draxxin, tulathromycin, Draxxin, EMEA/V/C/000077.

PINK TEETH'S PREVALENCE IN DOGS WHO ADDRESSED VETERINARY DENTISTRY TREATMENTS IN CLUJ-NAPOCA AREA IN 2021

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Introduction: Dental pathology in dogs includes a variety of ailments and diseases with both low and high prevalence rates in everyday clinical practice[1,2]. One less common morphological disorder, but with significant clinical importance, is the presence of pink-colored tooth, either solitary, or up to four teeth, in the oral cavity of a canine case[2]. As there is no consensus with respect to the origin and the pathophysiological mechanism of the "pink teeth" disorder, more investigations are required, both morphological and biochemical[2]
Aims: This case report aims to determine the prevalence of pink teeth in dogs who addressed veterinary dentistry treatments in the Cluj-Napoca area in 2021.
Materials and Methods: A retrospective study was conducted, by accessing the database of patients who addressed the veterinary dentistry service in 2021. The selection criteria were the pink-coloured tooth, established by comparing the color of the involved tooth with the rest of the present teeth. No special methods were needed for the correct diagnosis of the pink-coloured teeth. Visual inspection was the only method applied for diagnosis.
Results: Out of 372 dogs, 14 were bearers of pink-colored teeth. A number of 19 teeth were diagnosed as pink-colored. 3 teeth were surgically extracted, and 16 were treated endodontically. Out of 14 dog cases with pink-coloured teeth, one case each had 4, 3 and respective 2 teeth involved; the rest had only one pink-coloured tooth. Regarding the type of teeth involved, the distribution was: one carnassial, 4 incisors and the rest were canines.
Conclusion: The presence of pink-coloured teeth in the dog population is not negligible. With a 3,76% presence during one year, involving essential teeth in the ergonomics and dynamics of the dental arches, one may admit that pink-coloured teeth in dogs are a dental pathology that needs further in-depth study.

Keywords: dentistry, dogs, pink teeth, prevalence.

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MEASURE TO CONTROL OF PARASITIC INFECTIONS OF SWINE IN COMMERCIAL FARM

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Introduction: By preventing the occurrence and spread of parasitic infections on farms, we obtainto reduce the prevalence of parasites, which achieves that as few infected swine as possible reach slaughterhouses and keep the risk of parasitic zoonoses in meat and pork products at zero.
Aims: of rersearch was to determine optimal bisecurity measure to control parasitic infections of swine in commercial farm
Materials and Methods: on commercial swine farms we application integrated concept of biosecurity measures to control parasite infection required by systematic monitoring of infection on farms and slaughterhouses before and after the applied measures.That included adherence to the principles of good production and hygiene practices, management of the production process, parasitological diagnostics, strict compliance with biosecurity measures, general zoohygiene measures, pest control and disinsection, removal of corpses, removal of manure, control of the presence of stray dogs and cats on the farm and control of freliving birds.
Results: With the flexible cooperation of farm owners/individual breeders with professional services (veterinary stations, institutes), with respect and implementation of expert knowledge, and the application of a series of biotechnical measures and emphasizing the prevention of swine diseases, with the aim of promoting the good health of swine, it is possible to improve production and suppress the presence of parasitic infections.
Conclusion: Biosecurity, welfare, good production practice and risk analysis at critical control points are very important elements for intensive swine production. The planned application of biosecurity measures is crucial in protecting and control parasitic infection of swine and the success of production.

Keywords: swine, parasites, control

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RESEARCH ON THE DORSO-LATERAL APPROACH OF THE DISTAL LUMBAR SPINE IN DOG HEMILAMINECTOMY

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Introduction: The main feature of the lumbar vertebras in dogs is the representation of highly developed transverse processes.
Materials and methods: Due to the flattened dorso-ventral aspect of the lumbar vertebral body, we proposed and experimented, for this area, the approach of the latero-dorsal vertebral canal, which confers the opening of the vertebral canal and a sufficient protection area of the spinal nerves. This approach has proven effective in that the spinal cord can be released over a sufficiently large distance without having repercussions in the dynamics of postoperative movements.
Results and Discussions: Statistically following a number of 7 cases operated compared to the data in the literature, this approach shortens the recovery time of the operator port between 10-25%.
Conclusion: The applied postoperative treatment was the classic one and the recovery with the help of LASER treatment gave the best results.

Keywords: Dog, hemilaminectomy, laminectomy, vertebral body

GENERAL MOLECULAR SCREENING OF APICOMPLEXAN BLOOD PARASITES *BABESIA SPP.* AND *HEPATOZOON SPP.* IN MICROMAMMALS FROM ROMANIA

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Introduction: *Babesia spp*. and *Hepatozoon spp*. are apicomplexan blood parasites that infect a variety of animals. They are among the most widespread apicomplexan protozoan parasites worldwide. Their life cycle includes an invertebrate hematophagous vector as a definitive host and vertebrates as intermediate hosts (Levi et al., 2018). Hemogregarines of the genus Hepatozoon are intraerythrocytic parasites, that have been described in all groups of therapod vertebrates, but mostly in carnivores (Smith, 1996). Piroplasms of the genus Babesia are small intraerythrocytic protozoan parasites, which are widely distributed in mammals. Babesiosis is an emerging and potentially zoonotic disease (Kumar et al., 2022). Wild rodents and micro mammals play an important role in nature as reservoir for these pathogens.
Aims: The aim of this study was to assess the presence, prevalence, frequency of *Babesia spp*. and *Hepatozoon spp*. in micromammals from Romania, by using molecular methods.
Materials and Methods: This study was performed in Romania, on a total number of 377 micromammals (3 orders and 26 species), from 15 counties.
Results: Out of 377 analyzed DNA samples, 31.03% (C.I. 95%: 26.58-35.88) were positive. Of the 3 analyzed orders of micromammals, the highest prevalence was found in the Rodentia order: 35.87% (C.I. 95 %: 29-40.38), (p= 0.00000013163), followed by the Eulipotyphla order: (C.I. 95 %: 7.83-25.35), (p= 0.000000022969), and finally the Notoryctemorphia order:18.18% (CI 95%: 2.28-51.78). As far as species prevalence is concerned, of the 26 analyzed species of micro mammals, the highest prevalence was found in: *Microtus arvalis*- 78.72%, 37/47(C.I. 95%: 65.3-89) followed by: *Myodes glareolus*- 68.97%, 20/29 (C.I. 95%: 49.17-84.72), *Apodemus uralensis*- 31.82%, 7/22 (C.I. 95 %: 13.86-54.87), and Glis glis- 24.14%, 7/29 (C.I.95%: 10.3-43.54).
Conclusion: Given the reservoir potential of micromammals for the two abovementioned pathogens, and their presence in the proximity of domestic (urban and peri-urban) areas, the risk for animal and human health should be considered.

Keywords: *Babesia spp.*, *Hepatozoon spp.,* micromammals.

FIRST REPORT OF AFRICAN SWINE FEVER VIRUS GENOTYPE II IN SYMPTOMATIC PIGS IN ROMANIA

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Introduction: The World Organization for Animal Health has listed African swine fever as the most important deadly disease in domestic swine around the world. In Europe, two circulating genotypes of ASFV were previously identified, each of them having a different place of origin. Genotype II was recently brought from South East Africa to Georgia in 2007, and it has since expanded to Russia, Eastern and Central Europe, China, and Southeast Asia, having a devastating impact on the global swine industry and economy. Based on sequence differences of the B646L and E183L genes, which encodes the primary variable capsid protein p72, respectively p54, ASFV strains and isolates were classified into 24 genotypes, reported in eastern and southern Africa. Genotypes I and II have been established in other regions, as well [1].
Aims: The present study aimed to assess the ASFV genotype present in Romanian ASF outbreaks.
Materials and Methods: Ten previously extracted DNA blood samples from Veterinary Health and Food Safety Department Cluj were randomly selected and molecularly investigated. To investigate the phylogenetic analyses among ASFV genotypes, a phylogenetic tree of both the B646L and E183L gene regions was constructed based on all unique sequences obtained in the current study and those available in GenBank.
Results: The presence of the viral DNA was confirmed in all tested samples for E183L and in nine for B646L. All positive samples were successfully sequenced and phylogenetically analyzed for p72 (B646L) and p54 (E183L) targeted genes. The ASFV Romanian samples clustered within p72 genotype II and showed 100% identity, respectively 97-98% within p54 genotype II, with all compared ASFV isolates from Georgia, Armenia, Azerbaijan, Belarus, Russia, Lithuania, Poland, and Ukraine.
Conclusion: This is the first report of ASFV genotype II in Romania based on both E183L and B646L gene regions.

Keywords: *African swine fever virus (ASFV); domestic pigs; genotype II; p72; Romania*

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FLORFENICOL USE IN VETERINARY MEDICINE: A META-ANALYSIS. IS THERE ANY WAY WE CAN IMPROVE IT?

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Introduction: Florfenicol is a broad spectrum bacteriostatic antibiotic, mainly used in veterinary therapeutics, including farm animals and aquatic animals (Zhang et Zhou, 2015). It is a semi-synthetic florinated analogue of thiamphenicol and chloramphenicol, functioning by inhibiting ribosomal activity to interfere with bacterial protein synthesis, it presents a strong activity against Gram positive and negative bacterial groups and it is also reported as having an anti-inflamatory activity by marked reduction in immune cell proliferation and cytokine production (Shuang et al., 2011). Thus, the need for improvement came from the irrational use of this antimicrobial that lead to serious concerns about florfenicol-related resistance genes (Li et al., 2020), and also because florfenicol has a low water solubility and it is difficult to formulate a aqueos solution in organic solvents (Zhang et Zhou, 2015).
Aims: to identify alternative ways of using florfenicol in veterinary therapeutics and analyse the advantages and limitations provided.
Materials and Methods: The paper is based on scientific articles and systematic reviews identified on the Web of Science database;
Conclusion: An interesting approach of the poorly water-soluble drugs such as florfenicol is the rapidly emerged nanoscience, offering alternative ways of dosing and administration by providing new pharmaceutical formulations such as nanoemulsions (Zhang and Zhou, 2015), antibiotic-loaded polymeric nanoparticles based on natural polymers such as chitosan (Carmona et al., 2018) or synthetic polymers-PLGA (Karp et al., 2018).

Keywords: alternative drug delivery, antibiotic-loaded nanoparticles, florfenicol, nanoscience;

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VAGINAL AEROBIC BACTERIA IN LACTATING AND PERIPARTURIENT BITCHES

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Introduction: The vaginal microbiota in bitches is highly diverse and may be impacted by several sexual phases or the puerperal stage (Del Carro et al., 2022). Furthermore, the vaginal microflora may also influence the health of the lactating mammary gland. Finally, the microbiome of the litter may also be influenced by the bitch vaginal microbiota composition (Del Carro et al., 2022) since puerperal mastitis and metritis cause mortality in lactating bitches (Vasiu et al., 2021).
Aims: The present research aims to characterize the prevalence of aerobic bacteria in periparturient and pseudopregnant bitches.
Materials and Methods: Vaginal samples were collected from 2 antepartum, 49 postpartum, and 6 pseudopregnant bitches, of various breeds, ages (± 45.69 months), and sizes (± 29.78 kg). Standard microbiology assays were performed using different cultural media, and after bacterial isolation, the strains were identified using the Vitek2 technology.
Results: In the antepartum bitches, the Staphylococcaceae (50%), Streptococacceae (25%), and the Burkholderiaceae (25%) were the main isolated families. From postpartum bitches, the Staphylococcaceae (48.4%), Morganellaceae (10.8%), and Rhizobiaceae (9.7%) were the main isolated families. Finally, from pseudopregnant bitches, the Staphyloccoccacea (53.8%), Bacillaceae (23.1%), Micrococcaceae (7.7%), Morganellaceae (7.7%), and Pseudomonadaceae (7.7%) families, had the highest prevalence.
Conclusion: The heterogeneity of the vaginal strains can be influenced by the periparturient period, with Staphylococcus as the leading bacterial genus isolated. Furthermore, in bitches with pseudopregnancy, the vaginal microbiome is somewhat different from those in periparturient bitches.

Keywords: aerobic bacteria, bitch, microbiome, vaginal

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WHITE-NOSE SYNDROME. A THREAT TO BATS AND THE CARSTIC ENVIRONMENT

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Introduction: Bats are mammals whose ability to actively fly makes them unique in the world. As proven in the past, their microbime has the potential to critically impact the health of other animals and that of humans. Several bacterial and viral agents are kown to have zoonotic potential, however one of the most recent threats to bat colonies is the white-nose syndrome. White-nose syndrome (WNS) is an infectious disease that can affect hibernating bats and is produced by a fungus, *Pseudogymnoascus destructans.* WNS can spread rapidly among insectivorous bats in their underground and above-ground places of overwintering, such as caves and mines. Furthermore, the morbidity and mortality of WNS can often be as high as 80%, leading to devastating losses in bat colonies.. Under favorable conditions, *P. destructans* can grow as a mold with exuberant white hyphae on the skin and muzzle fur of susceptible bats. Signs of active infection can include patches of rough skin on the wing membranes, forearms, ears and feet.
Aims: to review the importance *Pseudogymnoascus destructans* posses to bat colonies and carstic enviroment and the impact it could have on animal and human medicine.
Materials and Methods: This paper is based on scientific articles and reviews found on the Web of Science database;
Conclusion: Much is still to be learned about WNS, including the management of the disease in free-ranging wildlife. *P destructans* presents unique threats because its spores can survive in the soil, independent of mammalian hosts, escaping the selective pressures that prevent other host-dependent pathogens (such as viruses) from entirely destroying their reservoir populations.

Keywords: bats, carstic environment, fungal infection, infectious disease

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