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INVITED SPEAKERS

NEW CHALLENGE OF FRUIT GROWING IN ROMANIA

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Fruit growing departmental research and development units in Romania belong to the Academy of Agricultural Sciences and are represented by six centers spread in different environmental and soil conditions all around the country. The main research topics are: studies of genetic variability and inheritance of major characteristics in fruit trees and berries, preservation and evaluation of the fruit genetic resources, breeding of new cultivars with fruit quality and resistance to biotic and abiotic factors and breeding of rootstocks, zoning of the fruit species and varieties, sustainable fruit technologies and environment protection.

The most extensive fruit crops still are represented by plum and apple.

According to breeding for resistance for apple scab (*Venturia inegualis*) the genes identified with the major effect on resistance are from *Malus floribunda* 821 (Vf), from *Malus baccata jackii* (Vbj) and from *Malus pumila* (Vr).

Plum pox virus (PPV) attacks plum, peach and apricot being transmitted by aphids as well as by grafting. As source of tolerance 'Stanley' and 'President' cvs. are good parents, but also 'Jojo', 'Jofela', 'Joganta', 'Jolina' as new source should be used.

National Plan for Rural Development has supported in the last 5 years a special project for investment in fruit growing, which has improved about 9,000 ha as new fruits exploitations.

Key words: fruit growing, species, resistance, breeding, rootstock

SHAPING THE FUTURE OF ORGANIC BREEDING & FARMING CHALLENGES AND ACHIEVEMENTS OF VEGETABLE SECTOR

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One of the most important priority at EU level is to develop models and opportunities for producing high quality food with low environmental impact. In this context, more than never organic farming will play an essential role in developing a sustainable food system for the EU. A sustainable food system is at the heart of the European Green Deal. Under the Green Deal's Farm to Fork strategy, the European Commission has set a target of 'at least 25% of the EU's agricultural land under organic farming by 2030'. Regardless all benefits for human health and environment, implementation of this ambitious plan, can sound utopic, especially in term of food security for a growing population, and under the pressure of climate change and pathogen attack. The challenges and achievements of vegetable research program developed by VRDS Bacau are presented in purpose to identify future cooperation to support organic sector to reach its full potential.

Keywords: ecologic, field safe, environment

BIODIVERSITY OF AQUATIC ORGANISMS

CETACEAN-FISHERIES INTERACTION IN THE BLACK SEA

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The Black Sea is a semi-enclosed sea, with a narrow connection to the Mediterranean, where three Black Sea cetacean subspecies (*Tursiops truncatus ponticus, Delphinus delphis ponticus, Phocoena phocoena relicta*) are already under much anthropogenic stress such as bycatch, pollution, underwater noise and prey depletion due to overfishing and human-mediated biological invasions. It has been impossible, however, to evaluate the level of such impacts as there have been only scarce baseline data available on the population abundance and distribution of these cetaceans in recent times. Interactions between cetaceans and fisheries in the Black Sea are probably as old as the first human attempts to catch fish with a net. In most cases this operational competitive interaction with set nets results in net damage, reduction in the value of the catch due to mutilation or removal of fish from nets and decreased total amount of fish caught or ultimately in bycatch of dolphins and porpoises. It is unclear why this issue appears to be inexistent at national level in Black Sea countries. The present study indicates once again that bycatch exist and the level of bycatch in Black Sea is most probably the highest in the ACCOBAMS area at least. Such information is of major interest for improving the conservation of cetaceans and their habitats in the agreement area.

Keywords: CeNoBS, Black Sea, dolphin, porpoise, bycatch

GENETIC POPULATION STRUCTURE OF THE CRITICALLY ENDANGERED STELLATE STURGEON (*ACIPENSER STELLATUS*) IN THE BLACK SEA BASIN: IMPLICATIONS FOR CONSERVATION AND SUSTAINABLE USE

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Stellate sturgeon (*Acipenser stellatus*) is a species of high conservative concern throughout its range. Its population experienced a dramatic decline in abundance and distribution in the Black Sea basin. Information regarding the genetic structure of the species is crucial for the development of adequate management for species conservation and sustainable use in the region. We used mitochondrial DNA markers (cytochrome b and D-loop) and microsatellite genotyping to investigate genetic diversity, gene flow and population structure of stellate sturgeon in the North-Western and Southern part of the Black Sea. Both types of genetic markers revealed high genetic diversity (a total number of 153 haplotypes and 262 alleles) and low genetic differentiation between the two regions of the Black Sea due to an active gene flow. Demographic analyses showed that stellate sturgeon experiences an active demographic expansion after a bottleneck event induced by historical overharvest and habitat fragmentation and degradation due to the construction of dams. Currently, the stellate sturgeon population of the two regions of the Black Sea is defined by two genetic clusters, one cluster in the North-Western part of the Black Sea represented by free spreading Danube population, and two clusters in the Southern part represented by the free spreading Danube population and by a remnant micro-population spawning in the Turkish rivers. While the presence of only two genetic clusters

indicates the loss of spawning grounds on the natal rivers, the second genetic cluster in the Southern Black Sea points to the existence of active spawning sites outside the Danube River, most probably in one of the Turkish rivers. The implications of our results for the management and conservation of stellate sturgeon population in the Danube range countries and Turkey are also discussed.

DATA CONCERNING THE STRUCTURE OF THE MAYFLY COMMUNITIES (INSECTA: EPHEMEROPTERA) IN THE LOWER BASIN OF THE RIVER MURES (ROMANIA)

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Knowledge of the structure of benthic Ephemeroptera communities is a tool for assessing the trophic status of the aquatic ecosystems, as well as an important indicator of the level of pollution frequently used in determining the quality of water bodies.

The research study on the structure of the mayfly communities was conducted in Mures lower gorge. The biological material was sampled during May 2011, from 18 sampling sites placed on 15 tributaries of the River Mureș.

The biological material collected using a kick net with an area of 124 cm^2, and the mesh size of 250 μm was qualitative and quantitative processed.

It was found that the mayfly communities reached 3265 individuals belonging to 25 species, 15 genera and 9 families (Ameletidae, Baetidae, Caenidae, Ephemerellidae, Ephemeridae, Heptageniidae, Leptophlebidae, Oligoneuriidae, Potamanthidae). Two of the Ephemeroptera families proved a significant abundance: Heptageniidae (1105 individuals), and Baetidae (1103 individuals).

The highest abundance was recorded in two of the sampling sites: Valea Crăciunească, 1 km upstream Toc village (630 individuals belonging to 7 families), and Valea Stejar, upstream Stejar village (573 individuals belonging to 6 families).

In terms of frequency, the most widespread species are: *Baetis rhodani* (94,44%), *Heptagenia sulphurea* (66,67%), *Ephemera danica* and *Rhithrogena semicolorata* (44,44%).

The species richness was highest in the following sampling sites: Juliţa, 2.6 km upstream Juliţa village (15 species), Valea Stejar,

upstream Stejar village (14 species), and Valea Crăciunească, 1 Km upstream Toc village (13 species).

The diversity of the species as well as the high abundance of species recorded in some of the sampling sites indicates relatively clean and unpolluted water bodies in the lower basin of River Mures.

Keywords: benthic macroinvertebrate, mayfly, River Mures

STUDY OF PLANKTONIC TROPHIC RESOURCES FROM THE OFFSHORE ZONE OF THE DANUBE DELTA FRONT

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This paper aims to realize an analysis of trophic resources of plankton water surface horizon (0-1m depth), the offshore area of the Danube Delta front, at a distance equal approximativ of Sulina and Constanta 195m isobath; aims ratio of the total suspended matter and quantities of phytoplankton (primary production quality) and zooplankton (C1 and C2), the availability of these resources for higher trophic links.

The study was carried out within the monitoring program in the Trident-Lukoil perimeter, after the completion of the gas field prospecting works; the study had a wider field of investigation, geochemical, chemical, physical and biological (being carried out in partnership with the Scientific Laboratory "Blumenfield" Constanta and the research ship "Ocean Spirit").

For this purpose, water samples were collected (using Van Dorn Water Sampler for the analysis of total suspended solids and phytoplankton, standard volume - 1); zooplankton samples were collected from the water column on two horizons: 0-0.5 m and 0.5-1.5 m depth using the zooplankton net. The collection was carried out in November 2019, on a much larger area than the drilling location. Analysis of chemical data of the seawater sample showed a content of nutrients (based on nitrogen and phosphorus) whose value was in the lower half of the range of variation of permissible concentrations (according to Romanian legislation: 161/02/16/2006 OM), in time what the amount of total particulate organic matter was on average 1343.6 mg / L; of this biomass, that of phytoplankton was had a relatively low value compared to the value of zooplankton biomass.

Keywords: trophic resources, phytoplankton, zooplankton

BIODIVERSITY OF TERRESTRIAL ORGANISMS

MULTISENSORIAL QUANTIFICATION OF WATER AND BIOCENOTIC STRESS IN FRUIT GROWING BY PHYTONOMONITORING AND EARLY WARNING IN CONDITIONS OF CLIMATE CHANGES

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In the context of annual climate changes, it was a need for integrated interdisciplinary research and the choice of indicators for the early diagnosis of the level of water and biocenotic stress, to which modern orchards cultivated in a super-intensive system are subject. The paper presents the results obtained during the development of the project P1-1.2-PCCDI-2017-0662, Proiect Component 2 6PCCDI, regarding the determination and use of synthetic indicators for the early diagnosis of the level of water and biocenotic stress, to which modern plantations are subjected. Today's fruit ecosystems are open, highly anthropogenic biological systems that behave like 'black boxes' and record all the fluctuations produced by both the variation of abiotic factors and those produced by the interaction with biotic factors. The physiological responses of trees to water stress are dynamic, because as the level of water stress increases, the intensity of the response increases. The general response of plants to biotic and abiotic stress consists of: growth changes, inhibition of stomatal conductance and photosynthesis, stomatal closure, alteration of pigment content, biochemical changes, etc. The fluorescence of chlorophyll can be a basic indicator in determining the efficiency of photosynthesis, the degree of fruit ripening to senescence, as well as variations due to stress factors. The most accurate quantification of biocenotic stress, produced by crop pests, involved defining the validation and use of a set of indicators for early diagnosis and forecasting of biocenotic stress in plantations, to maintain health and increase the performance of fruit biocenoses. The monitoring performed with the help of

pheromone traps and with the automatic systems, showed that the flight of the pests was staggered over a longer period, due to the longer autumns, as well as due to the presence in the experimental modules of some varieties with later maturation. For the quantification of the biocenotic stress caused to the biological material studied by the main harmful agents, synthetic indicators were used, such as frequency (F%), intensity I (notes, 0-7), degree of attack (AD%) and varietal sensitivity index (VSI%), determined in the control variants, untreated with plant protection products. The tested equipment allowed the collection, organization, processing, and interpretation of an important volume of data organized in databases on water stress and biocenotic stress. Through the partnership with the University of Piteşti - Faculty of Electronics, Communications and Computers, an 'Automatic System for Early Diagnosis and Monitoring of Water and Biocenotic Stress in Horticulture' was designed and implemented through intelligent analysis of data taken from different types of sensors. An Integrated 'Cloud' Database has also been created, which is based on a new technology for storing and searching data, including photos, compatible with most current search engines. In the context of annual climate change, it was a need for integrated interdisciplinary research and the choice of indicators for the early diagnosis of the level of water and biocenotic stress, to which modern orchards cultivated in a super-intensive system are subject. The paper presents the results obtained during the development of the project P1-1.2-PCCDI-2017-0662, Proiect Component 2 6PCCDI, regarding the determination and use of synthetic indicators for the early diagnosis of the level of water and biocenotic stress, to which modern plantations are subjected. Today's fruit ecosystems are open, highly anthropogenic biological systems that behave like 'black boxes' and record all the fluctuations produced by both the variation of abiotic factors and those produced by the interaction with biotic factors. The physiological responses of trees to water stress are dynamic, because as the level of water stress increases, the intensity of the response increases. The general response of plants to biotic and abiotic stress consists on: growth changes, inhibition of stomatal conductance and photosynthesis, stomatal closure, alteration of pigment content, biochemical changes, etc. The fluorescence of chlorophyll can be a

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Keywords: fruit growing, climatic_changes, water_stress, biocenotic_stress

THE MORPHOLOGICAL BIODIVERSITY OF HIGH POTENTIAL SEA BUCKTHORN (*HIPPOPHAE RHAMNOIDES*) VARIETIES AND HYBRIDS

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Over the years, Fructex Bacau SRL conducted multiple studies and research on cultivation technologies and improvement for various sea buckthorn varieties. The morphological observations and determinations took place on the experimental field, with a four-year-old vegetation plantation, during 2020 and 2021. The planting pattern is linear, with a distance in between plants of 3-1.5 meters. The plantation includes seven high potential female varieties and three female hybrids along with one male variety (for pollination).

The studies include observations (in accordance with U.P.O.V) of the leaves and fruits. The scientific determinations were for the fruits only and targeted the fruit shape, weight, sugar content and dry substance indexes.

The results allow for a better understanding of the varieties and promotion of new assortment varieties. Valuable varieties allow for the implementation of ecological certified plantations with a high predictable fruit production yield as well as biochemical content.

SPECIES OF COMMUNITY INTEREST AS INDICATORS OF THE CONSERVATION STATUS OF NATURAL HABITATS

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The species of Community interest and the endemic species are often species vulnerable to anthropogenic impact. Their presence or disappearance in some areas can provide extremely valuable data for assessing the conservation status of the entire habitat. In the last three years, within a monitoring program of the conservation status of the protected areas included in the Natura 2000 network from Dobrogea, the situation of several insect species included in the lists of the Habitats Directive and of GEO 57/2007 was analyzed. Investigation of specific habitats for some of these species - *Zerynthia polyxena, Zerynthia cerisyi ferdinandi, Parnassius mnemosyne, Euphydryas maturna, Lycaena dispar, Tomares nogelii dobrogensis, Apatura metis, Arethusana arethusa, Heteropterus morpheus, Kirinia roxelana, Neptis hylas, Polyommatus amandus, Pyrgus sidae* - allowed to obtain interesting data of both the current situation of the populations of these species and on the conservation status of the habitats as well.

Keywords: Species of community interest, conservation status

THE STRUCTURE OF THE EPIGEOUS FAUNA IN MOUNTAIN HABITATS FROM THE FAGARAS AND IEZER PAPUSA MOUNTAINS

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Invertebrate species fauna depends directly on the structure of the habitat, and habitat condition is reflected in both taxonomic and qualitative structure of the fauna. A study carried out during 2019 2020 in mountain areas of the Iezer Papușa and Făgăraș Mountains allowed the substantiation of an analysis method and the highlighting of quantitative and qualitative differences in the structure of terrestrial invertebrate fauna. By comparing the taxonomic structure and the diversity of the epigeous invertebrate fauna of spruce forests, both the connections between the different groups of invertebrates and the correlation with the conservation status of the habitat were highlighted.

ASSOCIATION *AEGOPODIO PODAGRARIAE-ALNETUM GLUTINOSAE* KARPATI ET JURKO 1961 WITH *VITIS SILVESTRIS* FROM BISTRIŢA RIVER MEADOW

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This informative note brings to attention the existence of a very old specimen of wild vine, with a diameter at the wood tissue of 15 cm (the circumference with bark is 50-52 cm), which we consider secular, and which can set a record.

Key words: *Vitis vinifera* ssp. *silvestris*

THE DIVERSITY OF ENTOMOFAUNA FROM RIPARIAN HABITATS IN FĂGĂRAȘ MOUNTAINS

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Riparian habitats in the mountainous areas of Romania are one of the types of Natura 2000 habitats that have suffered over time a particularly severe impact. Located along the rivers and mountain streams, they were affected both by anthropogenic intervention - the development of technological road infrastructure, the construction of dams or the expansion of localities - and by natural causes. A study carried out between 2019 and 2020 in areas on the southern slope of the Fagaras Mountains allowed the analysis of the structure of the epigeous invertebrate fauna and the vegetal ayer according to the degree of conservation of ligneous vegetation. The data provided information on both the structure of invertebrate fauna and how the ecological reconstruction activities can lead to its restoration.

Keywords: diversity, riparian forest habitats

PLANT PESTS AND DISEASES IN SOME VEGETABLES CULTURES FROM VEGETABELE RESEARCH AND DEVELOPMENT STATION BACAU

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It is well known that in every agrobiocenosis, there are a number of pest species, called key pests due to their considerable ability to multiply, making frequent chemical treatments necessary. In addition to these key pests, vegetable crops also have secondary pests (which can cause damage in certain years and in some areas), potential pests (which do not cause significant damage but can become significant due to improper application of control methods) and migratory species from other crops but which may cause damage to vegetables.

In order to establish the most appropriate measures to prevent infections and combat diseases and pests from vegetable cultures a screening of plant pests and diseases in vegetable crops from VRDS Bacau was accomplished. A special importance was given to determine the causes that lead to diseases and the appearance of pests to cultivated plants.

Pest identification and the establishment of the complex of harmful species in a given culture serve to make reconnaissance maps in any software, as well as to determine pest species, parasites and predators, with important implications for an innovative technical system.

Key words: integrated, control, horticulture, precision

THE IMPACT OF THE WORKS TO REDUCE THE COASTAL EROSION IN THE NORTHERN AREA OF THE CHITUC SANDBANK ON THE HABITATS OF COMMUNITY INTEREST AND THE SPECIFIC VEGETATION

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Chituc sandbank is a strip of marine origin, with an area of 7700 ha, which was formed by the deposition of marine sands and alluvium of the Danube. It is part of the Danube Delta Biosphere Reserve and belongs administratively to Corbu commune. In the northern part of Chituc sandbank, two channels - Edighiol and Periboina there are through which Lake Sinoe communicates with the Black Sea. Chituc sandbank is an alternation of sandy surfaces more or less salty and lakes, ponds and swamps in the low areas. The coastal area of the Chituc sandbank is one of the few wild beaches unaltered by man, at least in the northern part of the sandbank which is strictly protected. On the dunes from the beach area and in their outpost several types of habitats of European interest are well represented: 1210- Annual vegetation of drift-lines, 2110 - Embryonic shifting dunes, 2130 * - Fixed coastal dunes with herbaceous vegetation (gray dunes), 2160 - Dunes with *Hippophae rhamnoides* and 2190 - Humid dune slacks. To the west of the sand dunes, salt marshes with halophilic vegetation occurs which belong to the habitat types: 1410 - Mediterranean salt meadows (*Juncetalia maritimi*), 1310 - Salicornia and other annuals colonizing mud and sand and 1530 * - Pannonic salt steppes and salt marshes.

Within the project "Reduction of coastal erosion - phase II, coordinated by the Dobrogea-Litoral Water Basin Administration, of which main purpose is reduction of coastal erosion by widening of the beaches, rehabilitation of the hydrotechnical structures of the Edighiol

and Periboina channels is another purpose of the project.

The illegal road built directly on the beach along the Chituc sandbank and the arrangement of Edighiol and Periboina channels threaten the biodiversity of this wild area, until recently unaltered by humans.

In the paper we will present the affected habitats and the communities of rare plants which are threaten as a result of the planned works and of non-compliance by the builder of the contractual commitments and of the conditions specified in the environmental permit.

Key words: threatened habitats, plant communities, coastal works, Chituc sandbank

OBSERVATIONS REGARDING THE CELERY FLY (*EULEIA HERACLEI* L.) IN LOVAGE (*LEVISTICUM OFFICINALE* W.D.J. KOCH) CULTURE FROM VEGETABLE RESEARCH AND DEVELOPMENT STATION BACAU

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Celery fly *Euleia heraclei* (Linnaeus, 1758) is a species of fruit flies in the genus Euleia of the family Tephritidae. It is a species considered harmful because the larvae of this insect are mining inside and destroying the leaves of celery, lovage, carrot, parsnip, etc. Usually, the attacks begin in May, but scientific studies report that the second-generation of larvae are more destructive. At the Vegetable Research and Development Station Bacau, this insect was identified on the lovage leaves in the spring of 2021 where the frequency was 96% and the degree of attack (GA%) was 3.92%.

Keywords: celery fly, crop pests, diptera, garden crop

FORESTS WITH PINE TREES (*TAXUS BACCATA*) AND YEW (*PINUS SILVESTRIS*) FROM OITUZ PRIVATE FOREST DISTRICT

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Taxus baccata is sporadically present in some forest plots covered with a mixture of softwood and beech trees and is protected as a natural monument. *Pinus silvestris* continues to form semi-natural forests of relatively restrained areas. These forests require special attention given that they are located on very steep slopes and the soil is reduced and stony.

Key words: *Taxus baccata, Pinus silvestris*, forests with high level of protection

SOME ASPECTS ON THE CONSERVATION STATUS OF THE 8210 HABITAT - 'ROCKY RIDGES WITH CHASMOPHYTIC VEGETATION ON CALCAREOUS ROCKY SLOPES' WITHIN THE NATURA 2000 ROSCI 0212 SITE IN RARĂU – GIUMALĂU

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The 8210 habitat - 'Rocky ridges with chasmophytic vegetation on calcareous rocky slopes' within the Natura 2000 ROSCI 0212 site in Rarău – Giumalău lies in the rocky mountain area of Pietrele Doamnei, the North - eastern limestone ridge towards Câmpulung Moldovenesc, scattered calcareous ridges in Șaua Ciobanilor and Popii Rarăului. The field research acknowledges that the habitat is situated at high altitudes (more than 900 m). The field monitorisation took two years (between 2019 and 2021). The research revealed pressures and threats for this area, therefore our recommendations and regulations meant to reduce the impact on the habitat. This present scientific study is intended to complete the data from the Standard Form and from the Management Plan of the 8210 site.

Keywords: Rarău-Giumalău, conservation status, threats, pressures, impact diminishing regulations

ANALYSIS OF GENETIC DIVERSITY IN TWO CULTIVATED SORGHUM VARIETIES IN THE CONTEXT OF CLIMATE CHANGE IN ROMANIA

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Sorghum (Sorghum bicolor (L.) Moench, 2n = 2x = 20) is the fifth most important cereal crop in the world, being used mainly in human and animal food, but some states also use it as biofuel. As a percentage, its use for human consumption is growing rapidly, due to the interest in using it as a gluten-free substitute for wheat. Sorghum is a relatively drought and heat tolerant species, which makes it an ideal crop in areas with extremely unfavorable temperatures and in dry regions with minimal rainfall, as more and more agricultural areas in Romania become. Given the adaptability and tolerance to stress, sorghum is an excellent culture to study the genotype-phenotype relationship, as well as to analyze the genotype through environmental interactions for complex, quantitative traits. The aim of this paper is to analyze the efficiency of the ISSR technique in quantifying genetic diversity and estimating phylogenetic relationships in two commercially available sorghum varieties, namely S. bicolor var Shamal and S. bicolor var. Arabesque. The seeds were harvested from the field, from crops made in Calarasi County. In order to obtain the genetic material, young plants obtained after seeds germination on basal culture MS half strength media was used. The biologic material was harvested 30 days after inoculation. DNA extraction was performed using CTAB / sarcosil technique, which consists of a complex protocol, adapted to the biochemical characteristics of plant tissues with a high content of secondary metabolites (modified after Dehestani and Kazemi, 2007); for DNA fingerprinting, quantification of genetic variation and establishment of the relatedness relationship

between the two cultivated sorghum varieties we tested a larger number of ISSR primers of which four were selected: UBC 808, UBC 809, UBC 823 and UBC 840a. The agarose gel electrophoresis images were processed with the PyElph 2.5 program, software that allows the detection, identification, and quantification of bands for each sample. Following the analysis of the band patterns obtained for each primer, it resulted that the 4 ISSR primers generated a total of 311 bands, of which 210 were polymorphic and 101 monomorphic. UBC 823 generated the largest number of polymorphic markers (74 out of a total of 123), while UBC 809 generated only 39 polymorphic markers out of a total of 55. UBC 840a generated a total number of 68 bands (NTB), of which 53 were polymorphic and 15 are monomorphic, the percentage of polymorphic bands representing 77.97% and that of monomorphic bands 22.05%. UBC 809 generated 55 NTBs, 70.90% of which were polymorphic. In order to perform a complete analysis of the degree of genetic differentiation between sorghum varieties and the level of genetic diversity at intra- and interpopulation level, we used PopGene32 program and calculated Shannon (I) diversity index and Nei gene diversity index. Thus, the highest values of the Nei index were obtained for the UBC 840a primer (0.0530), while the highest Shannon index, for UBC 823 (0.5742) and UBC 809 (0.5526). The N m index values (which measures the genetic flow in a population) calculated for these primers were 18.463 and, respectively, 19.8527. These values suggest that most of the molecular variation is found within populations. Based on the distance matrices and using the UPGMA method we also constructed a dendrogram in which the individuals of the two varieties formed two distinct clusters, one grouping the samples of S. bicolor variety Shamal and the other the samples from S. bicolor variety Arabesque. Because the ISSR primers used generated qualitative band patterns, which highlight a high level of differentiation between Sorghum bicolor varieties (especially UBC 840A and UBC 809), they are considered to be extremely useful in estimating the level of genetic variation of sorghum varieties. The obtained results must be deepened by using a much larger number of ISSR markers but also by analyzing several varieties.

Keywords: Sorghum, DNA fingerprinting, ISSR, genetic variation, relatedness relationship

BIOTEHNOLOGIES FOR ENVIROMENTAL PROTECTION AND RESOURCES' VALORIZATION

FLAVONOIDS AS NATURAL PHENOLIC COMPOUNDS FOR ENHANCING MEMORY AND ANTIOXIDANT APPLICATION IN NEURODEGENERATIVE DISORDERS

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The loss of neuronal structure and function, particularly in the hippocampus and neocortex, is a critical risk factor in most neurodegenerative cases characterized by memory impairment and disorientation, particularly in Alzheimer's disease, which occurs with the loss of neuronal structure and function. In acute and chronic neurodegeneration, selective removal of axons, dendrites, and their branches, even without loss of the parent neurons, is a common occurrence. Furthermore, oxidative stress is implicated in the etiology of several neurodegenerative illnesses, including Alzheimer's. In recent years, many studies have been conducted to determine the medicinal potential of numerous secondary compounds found in plants. The literature has indicated that phenolics and flavonoids, among other secondary metabolites, are responsible for a wide range of therapeutic effects in humans and animals. In the present study, flavonoids (agathisflavone, rhoifoline and baicalein) biological function for improving the cognitive status and brain oxidative stress using a scopolamine-induced a zebrafish (Danio rerio) model of cognitive impairment will be discussed.

Keywords: flavonoids, memory, oxidative stress, zebrafish, dementia

TWO NEW YEAST STRAINS WITH APPLICATIONS IN BIOREMEDIATION OF OIL-POLLUTED ENVIRONMENTS

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Bioremediation represents an ecologic and economic solution for remediation of polluted environments, using the natural ability of microorganisms to assimilate and degrade various substrates with eco-toxic potential. Yeast strains belonging to Candida and Rhodotorula genera have been isolated from oil-polluted habitats, with the ability to convert a wide range of petroleum (crude oil) hydrocarbons or byproducts in biocompounds of biotechnological interest. The present research deals with the identification and characterization of two new yeast strains, *Candida parapsilosis* YT-CMGB and *Rhodotorula glutinis* YR Ks-CMGB, for further applications in bioremediation. The yeast strains YT-CMGB and YR Ks-CMGB, isolated from oil-polluted soil, respectively, kerosene tanks, were preliminary identified using morpho-physiological techniques, standardized kits (API 20C AUX bioMerieux) and automated taxonomical identification systems (BIOLOG). Molecular classification included PCR-RFLP for the ITS-5.8SrDNA-ITS2 and 18S rDNA-ITS1 regions, phylogenetic and biodiversity studies (PCR-RAPD, Biorad Quantity One). Metabolic profile screening was based on assimilation tests in presence of petroleum compounds and alkanes and evaluation of biosurfactant production (emulsification index E24%). The preliminary identification tests showed that the strain YT-CMGB belongs to *Candida parapsilosis* and YR Ks-CMGB to *Rhodotorula glutinis* species. Phenotypical phylogeny using the BIOLOG system, showed 99% similarity between the strain YT-CMGB and *C. parapsilosis*, while the API system identified the strain YR Ks-CMGB as *R. glutinis*. The phylogenetic tree placed *C. parapsilosis* YT-CMGB in the same cluster with the reference strain *C. parapsilosis* CBS604.

The PCR-RAPD technique used to determine the phylogenetic relationships between different strains of the Rhodotorula genera, revealed that this is a group of microorganisms whose genotype is strongly influenced by the source of isolation. Thus, *R. glutinis* YR Ks-CMGB isolated from kerosene tanks, has distinct properties compared to other strains from polluted environments or industrial processes. The assimilation tests for *C. parapsilosis* YT-CMGB showed an active growth curve for ten days on decane and tetradecane. Although the highest rates were observed on dodecane and hexadecane during six days of incubation, cell growth diminished after this period. Although the strain *R. glutinis* YR Ks-CMGB did not show a significant growth during the first seven days in the presence of different substrates, a series of intracellular changes were observed when cultured in the presence of aromatic hydrocarbons, associated, most probably, with the accumulation of intracellular lipids. The biosurfactant produced by *C. parapsilosis* YT-CMGB showed high emulsification abilities in presence of petroleum and fried vegetable oil, while the strain *R. glutinis* KR Ks-CMGB produced biosurfactants able to emulsify petroleum, waste oil or aliphatic hydrocarbons, especially when grown in the presence of toluene. Two new yeast strains were taxonomically identified and characterized, their biodegradative abilities representing an important basis for future application as bioremediation agents for oil-polluted environments.

Keywords: yeasts, Candida, Rhodotorula, oil-polluted environments, bioremediation

VALORIZATION OF AGRO-ALIMENTARY WASTES IN ENVIRONMENTAL DEPOLLUTION

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There are many studies in which biopolymers, such as starch, chitosan, cellulose and lignin are used to solubilize persisting hydrocarbons [Poli et al, 2011]. The exploitation of green materials gained much more attention from various fields of science. In plants, the most representative biomaterials are cellulose and starch. The sources of these bio-polymers are green materials, insects or agro-industrial wastes. Agro-industrial wastes are present in high proportion under the form of biodegradable types of wastes which can be the result of different activities: horticulture, viticulture, crops, wastes from livestock (manure) and other industrial activities. There is a growing interest in the recycling of biomasses of agro-industrial origin through extraction, reuse and upgrading. Wastes from agro-industries can be used in biotechnologies processes such as the production of value-added compounds and substrates for microbial isolation. The limitations of persistent organic pollutants (POPs) destruction are due to higher molecular weight, low water solubility and low availability. Polycyclic aromatic hydrocarbons (PAHs), in particular naphthalene, anthracene, and pyrene are known to be strongly absorbed to soil particles. The main sources of PAHs are incomplete combustion, digenetic processing of organic matter, to a smaller extent forest fires and in connection with oil pollution. There are various remediation methods which have been employed in the

removal of environmental pollutants such as chemical, thermal, and biological treatments [Magoha, 2004]. The aims of our research were to synthesize corn starch derivatives by alkylation reaction using ether (propylene oxide) or ester (succinic anhydride) alkyl agents in order to fulfil two main objectives: firstly, to increase the aqueous solubility of modified starch and secondly to allow benzo[a]pyrene (BaP) solubilization permitting therefore its retention in polysaccharide based materials. Indeed, BaP, a high molecular weight polycyclic aromatic hydrocarbon, is a toxic, carcinogenic, and mutagenic compound which tends to persist in the environment because of its very low water solubility and its tendency to be strongly absorbed on soil organic matter. Such chemical modifications of starches have been used to introduce new properties permitting their use as potential surfactant agent for enhancing BaP bioavailability for microorganisms, such as fungi. These researches extend starches applications as renewable for soil rehabilitation.

Keywords: agro-industrial wastes, polycyclic aromatic hydrocarbon, starch, chemical modification

MODERN CULTIVATION TECHNOLOGIES IN FRUIT GROWING FOR SEED AND STONE SPECIES THROUGH THE IMPLEMENTATION OF INNOVATIVE RESULTS (VARIETIES, VEGETATIVE ROOTSTOCK, GRAFTING)

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After a difficult period of time, Romanian fruit growing cultivation slowly started to recover and reclaim its well-deserved place within the economy. Several fruit growing companies have started their business in the county of Bacau, companies such as the one from Iteşti, Damieneşti and Plopana, which are conducted by enthusiastic professionals who are motivated to perform. Modern technologies have been developed in the old plantations from over 30 years ago, these ones facilitating the redeem of a large and qualitative production. Both apple and cherry tree species orchards were newly created using high-performing varieties, high densities of trees and innovative crown forms (thin spindle). The super-intensive fruit growing exploitation is based on the application of the research results in the field of vegetative rootstock (M9 for apple trees and Gisela 5 for cherry trees), grafting, drip irrigation and fertirrigation. Innovative methods are used in order to protect the trees from illnesses, pest, hail and rain. These fruit growing exploitations represent real demonstration lots that consist in a multitude of elements that should be taken into consideration and later on applied by those who are interested.

VALPROIC ACID EFFECTS ON THE AGGRESSIVITY AND LOCOMOTOR ACTIVITY IN AUTISM SPECTRUM DISORDERS

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Autism spectrum disorder (ASD) is one of the multi-factorial pathologies. Pathology is manifested through communication, networking and the repeated actions. Individuals with ASD have comorbid aggressiveness, deficient locomotor activity, specific hyperactivity and other pathologies. The prevalence of pathology indicates that 6.2 million people are diagnosed with a form of TSA. The classic diagnostic report shows that boys are more affected than girls, at a rate of 4:1. A factor that causes ASD pathology is valproic acid. Valproic acid is an environmental teratogenic factor on the human genome and development at the embryonal or fetal stage.

Contact with valproic acid in the first quarter of pregnancy produces deficiencies associated with TSA. The experimental model chosen is zebra fish (*Danio rerio*) because it is a model for neurological diseases in the ASD due to the similarity of the central nervous system, human genetic homology that can easily be manipulated.

The experiment seeks to develop a preliminary model of behavior typical of TSA disorder. The behavior conditions followed are swimming performance and aggressiveness. Poor locomotor activity is observed in both human and vertebrate patients. These behavioral patterns can be followed within the vertebrate model by analyzing swimming performance through the open-space test reproduced in the

T test. In the test, the T maze has been adapted to study the stand of aggressiveness induced by exposure to valproic acid. The adaptation of the test has been performed by introducing a visual stimulus (provided by the reflected reflection) into the left arm of the labyrinth. The purpose of the stimulus is to show the behavior of the aquatic model in relation to its reflection. It has two roles: the reaction to the spread of the image and the reaction to a conspecific.

Keywords: autism, *Danio rerio*, animal model, valproic acid

REMOVAL OF ETHACRIDINE LACTATE FROM AQUEOUS SOLUTIONS USING BIOSORBENTS BASED ON RESIDUAL MICROBIAL BIOMASS: FIXED- BED COLUMN STUDIES

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Pharmaceuticals represent one of the main types of persistent organic pollutants with negative impact on ecosystems. Biosorption offers an alternative to conventional methods (i.e., physicochemical processes such as adsorption, coagulation, sedimentation, filtration, ion exchange, membrane technologies and biological treatments) for the removal of drugs from different contaminated water matrices. This study investigated the biosorptive potential of Saccharomyces pastorianus residual biomass immobilized on alginate for Ethacridine lactate (EL) removal from aqueous solutions. The main objectives consisted in biosorbent synthesis and characterization and its biosorption capacity evaluation. Prepared biosorbent was characterized by scanning electron microscopy (SEM) and Fourier transform infrared spectroscopy (FTIR). Biosorption studies were carried out in a fixed-bed column. The SEM analysis shows that the obtained biosorbent beads have a spherical shape and a mesoporous structure. The biomass is homogeneously distributed in the polymer matrix, this fact confirming the success of immobilization process. FTIR spectra recorded after biosorption reveal specific peaks for EL functional groups, sustaining the retention of drug on the biosorbent material. The experimental setup reveals that for an EL solution with an initial concentration of 120 mg/L which passed through a 7.173 g of

biosorbent beads with a flow rate of 2 mL/min a maximum biosorption capacity of 67.46 mg/g was attained after 4 hours. This capacity reaches a minimum of 13.31 mg/L after 7 hours, when the biosorbent can be considered exhausted. In view of the above-mentioned aspects, we can conclude that the residual biomass from brewing industry represents a valuable source to obtain new materials with adsorptive properties which can be used in water depollution processes ensuring at the same time an alternative for waste capitalization.

Keywords: alginate beads, fixed-bed column biosorption, ethacridine lactate, immobilization technique, *Saccharomyces pastorianus* residual biomass

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RETENTION PROCESS OF LACTIC ACID ON HYDROTALCITE-TYPE ANIONIC CLAY

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The paper presents the results obtained at the mathematical modelling of the retention process of lactic acid from synthetic solution on hydrotalcite-type anionic clay. Lactic acid can be obtained by fermentation with bacteria selected on culture media based on natural raw materials. Recovery and purification of lactic acid have an important influence on its quality and final price.

To optimize the retention processes of lactic acid from synthetic solution on hydrotalcite, intensive liquid-solid (lactic acid solution /fermentation medium - anionic clay) contact methods are used. For increasing liquid-solid contact surface and to create hydrodynamic conditions favorable to mass transfer have been used mechanical mixing.

These results led to a good accordance with experimental data for variable parameters of the process (molar ratio Mg/Al, temperature, solid mass, initial concentration of lactic acid). This demonstrated that the model can be used for predicting the kinetic behavior of the system operating under similar mechanical mixing.

Keywords: lactic acid, retention process, hydrotalcite-type anionic clay, mathematical modelling

ANIMAL MODELS USED IN STUDYING THE IRRITABLE BOWEL SYNDROME

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The irritable bowel syndrome (IBS) is a fairly common gastrointestinal functional disorder with chronic but non-aggravating progression. According to the latest gastrointestinal disorders diagnostic criteria (ROME IV), IBS is mainly characterized by changes in the defecation frequency and fecal consistency (diarrhea, constipation) and recurrent abdominal pain. Due to the fact that just a few studies described some tissue or cellular damage of the intestinal epithelial lining or of the deeper layers of the intestine, the causes of IBS remain unclear. The heterogeneity of the risk factors (diet, visceral hypersensitivity, enteric nervous system impairments, stress axis hyper-activation, repeated intestinal bacterial infections, microbiota changes, genetic predisposition) suggests the multifactoriality of IBS physiopathology. The use of animal models to simulate the associated symptoms of human diseases in laboratory animals is a common research method in biomedical research and one of the most important means to study the molecular and pathophysiological mechanisms of diseases and therapeutic solutions. Thus, the specificity of the IBS symptoms (in the absence of aggravating tissue damage) and the multitude of factors that can increase the risk of developing this pathology were considered as sufficient premises to use a wide diversity of animal models. In this way, the aim of this presentation is to review the features and specific

traits of the most important animal models used in the study of irritable bowel syndrome found both in the literature and in our research group studies.

Keywords: irritable bowel syndrome, constipation, diarrhea, inflammation, animal models, rodents, fish

EFFECT OF NICOTINE ON THE DEVELOPMENT OF OVARIAN CARCINOMA

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Nicotine is a yellow alkaloid found in various plants, but the highest concentration is found in *Nicotiana tabacum* (tobacco plant). It is found in a wide range of products, intended for use in various fields: tobacco products, nicotine-containing medicines, nicotine-based insecticides, extracts used in the perfume industry.

Ovarian carcinoma cells are abnormal cells that appear in the ovaries and can invade or spread to other parts of the body, such as lymph nodes, lungs, and liver. The symptoms associated with this condition are pelvic pain, abdominal swelling, etc.

The aim of this study is to highlight the effect of nicotine in different concentrations on the number of cancer cells. The determinations were performed at 8 and 24 hours at different concentrations, at highest concentrations and in lowest ones.

During the study, the development of ovarian carcinoma was observed, using the following laboratory equipment: Countess II device - for analysis with trypan blue, Thermo scientific spectrophotometer for analysis with Resazurin. The photos were taken with the Countes II camera.

Both in the case of the analysis with the Countess II device and in the case of the analysis using Resazurin, decreases in cell viability were identified, with increasing concentration. Also, in analysis with countess II we observed a decrease in cells diameter.

In conclusion, nicotine in high concentrations also has a toxic effect on cancer cells, managing to reduce them numerically. On the other hand, given the inhibitory effect, we cannot say that it can have a

curative effect in cancer because the study focused only on the effect of nicotine on a single cell line and not on several different cell lines that communicate with each other.

ECOLOGY AND SUSTAINABLE DEVELOPMENT

FÂNTÂNIȚA MURFATAR NATURAL RESERVE - GENERAL PRESENTATION, ANTHROPIC IMPACT ANALYSIS AND PROPOSALS FOR PROTECTION MEASURES AND CONSERVATION

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Globally, one of the biggest environmental problems of the 21st century, is the loss of biodiversity, caused by the development of society, population growth and the intensification of anthropogenic activities that exert significant pressures on the environment.

Fragmentation and reduction of habitats in favor of urbanization, overexploitation of natural resources, development of intensive agriculture, overgrazing, irrational use of pesticides and herbicides, introduction of non-native species, as well as tourism are the main pressures that have led to habitat degradation, and depletion of fauna and flora species.

Uncontrolled tourism has a negative impact on the natural environment by degrading and destroying the flora, by not respecting the marked routes; disturbing animal species by camping, starting fires in illegal places and throwing household waste in nature. All these actions exert a great pressure on the natural environment, causing its deterioration. Consequently, ecotourism must be implemented and promoted all over the world.

Thus, the conservation of biodiversity in protected areas is the most efficient way to preserve natural and cultural capital, facilitating the restoration of biodiversity affected by anthropogenic activities. Management plans for these areas are developed and implemented in an appropriate way to maintain or even restore natural ecosystems. At the same time, if necessary, we suggest finding solutions for the rational use of natural resources.

The aims of this paper are to present the natural setting of the Fântânița-Murfatlar natural reserve, to highlight anthropogenic activities and their effects on this protected area, to identify the current and future threats, and finally, to make proposals for reducing anthropogenic pressures that may lead to the reduction or loss of habitats and species of this natural reserve.

THE ALLELOPATHIC POTENTIAL OF *ERIGERON ANNUUS* (L.) DESF. SUBSP. *ANNUUS* EXTRACTS ON CROP SPECIES

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Invasive plants are one of the biggest threats to biodiversity. The invasive plant species have a high allelopathic potential, which helps them spread to new areas. The allelopathic effect of invasive species on different plants varies upon to the phenophase. Erigeron annuus is an annual invasive alien species, which we can find in Romania. This paper investigated the allelopathic effect induced by aqueous and hydroalcoholic extracts obtained from Erigeron annuus (L.) Desf. subsp. *annuus* on crop species. The extracts were obtained using dried plant material from the aerial parts of the plant: stems, leaves, inflorescences. For each type of extract, we used two dilutions: 1:10 and 1:100. We used the seed of three of the most important crop plants: wheat (*Triticum aestivum* L.), cucumber (Cucumis sativus L.) and pea (*Pisum sativum* L.). After hydration, the seeds were immersed for one hour in extracts, and then put in Petri dishes in the dark. The parameters which were determined after four days of the beginning of the experiment are the length of the root and stem, fresh and dry biomass. The influence of extracts was more pronounced at the roots than at the stems of the seedlings, regardless of species. The effect varies upon the type of extract and upon the species. The hydroalcoholic extract diluted 10 times inhibited growth, especially in the case of dicotyledons.

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Keywords: invasive plants, allelopathy, extracts, wheat, cucumber, pea

GRAZING VERSUS DIVERSITY. MOUNTAIN AND ALPINE GRASSLANDS IN THE ROMANIAN CARPATHIANS CASE STUDY - PASTURES IN FĂGĂRAȘ MOUNTAINS, HAȚEGULUI COUNTY, METALIFERI MOUNTAINS

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Habitats with grassy vegetation in the mountain and alpine areas of Romania represents an important type of habitat in the Carpathian Mountains. These areas are grazed since antiquity, the effect of grazing being reflected both in the structure of the vegetation and on the invertebrate fauna present in these habitats.

In three monitoring studies carried out in the years 2019 - 2021 in alpine and mountain areas with grassy habitats in the Făgăraș Mountains, Țara Hațegului and Metaliferi Mountains, the taxonomic component of invertebrate species in the epigeous layer and in the grassy vegetation was analysed in correlation with the type of grazing practiced in the area. The study included alpine grasslands in the area of Fagaras and Iezer Papușa Mountains where intensive grazing was practiced, and areas of mountain meadows from Tara Hategului and Metaliferi Mountains (Roșia Poieni area), where the practices of use of grasslands had a less intense impact on the vegetation. The results allowed to draw some conclusions regarding both the impact of grazing and on the ways to follow in order to restore the initial state of the degraded habitats.

Keywords: diversity, overgrazing, ecological reconstruction

GREEN4CARE - EU BLUEPRINT ON GREEN CARE & GREEN CARE TOURISM

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The Green4C (GreenForCare) project, co-funded by the Erasmus+ Programme by the European Union, is a three-year project that aims at increasing Europe's innovation capacity among universities and businesses to promote nature-based solutions for health, well-being, and social inclusion. The project was conceived with the overarching aim of integrating two business and scientific sectors that were currently disconnected: the health and social inclusion sectors and the sectors related to the use of natural resources in both rural and urban areas. To support the successful integration of business and scientific sectors, Green4C is proposing the development of four innovative thematic sectors: Forest-based care, social agriculture, Urban green care and Green care tourism. In this regard, the EU Blueprint on Green Care was published, which reports on the opportunities and challenges for supporting innovation and entrepreneurship in these thematic sectors. The project analyzed 20 case studies across Europe and the Americas which were selected for their diversity in terms of focus on health, well-being and social inclusion activities, locations, targeted beneficiaries, and business models for in-depth interviews and surveys. The analysis reveals that Green Care initiatives are challenged by uncertainties in funding policies and regulation, low public awareness, and recognition of the role of such initiatives, lack of standards and integration into health care policies and practices. Green Care tourism refers to a wide range of organized tourism experiences and products that rely on nature and wild spaces for tourists in search of health, well-being, and regeneration. Tourism is not often considered as part of the environment, and usually, heavily visited sites suffer from degradation,

resulting in a decrease in tourists. Further, mass tourism does not take into account biodiversity, which is normally a natural area's major attraction. As part of the project, we are assessing high biodiversity areas that will allow humans to interact harmoniously with nature and preserving traditional land uses, strengthening local activities, and reinforcing traditional cultures. Furthermore, it promotes scientific and educational pursuits for the public through recreational, tourism, and educational activities. The objective of this study is to assess biodiversity levels from specific environments and to create a sustainable tourism network with specific guidelines. For this purpose, the Blueprint is an important knowledge tool containing recommendations addressed to the different stakeholders that need to take action to advance the role of Green Care initiatives for health, well-being, and social inclusion.

Keywords: Green Care tourism, Biodiversity, Social Inclusion, EU Blueprint on Green Care

EVALUATION OF HISTOPHYSIOLOGICAL ALTERATIONS IN RESPIRATORY PROCESS ASSOCIATE WITH FIPRONIL ADMINISTRATION IN EUROPEAN CHUB

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This study was conducted to investigate the toxic effects of Fipronil on *Leuciscus cephalus* (Linnaeus, 1758). Fipronil is a phenylpyrazole insecticide discovered and developed by Rhone-Poulenc between 1985 and 1987 and released to the market in 1993. The insecticide is widely used in agricultural management to control pests, and it can be leached into aquatic ecosystems. Fipronil acts by targeting gamma-amino butyric acid (GABA) receptors and has a much higher affinity for insects than vertebrate. The present study evaluates the changes of some important physiological indices (energy metabolism, respiratory rate, number of red blood cells) and histopathological gills tissues in *Leuciscus cephalus* exposed to the action of Fipronil insecticide in two concentrations (0.05 and 0.1 mg/l water). The experimental samples regarded the presence of respiratory and hematological changes in European chub intoxicated with Fipronil insecticide. This product has changed the fish respiratory rhythm and stimulating rate of oxygen consumption. The number of erythrocytes in the fish individuals subjected for 14 days to 0.1 mg Fipronil/l water was also significantly affected. Exposure of European chub to insecticide Fipronil administered in water for 2 weeks determined installation of pathological changes in gills tissues.

Keywords: fipronil, European chub, gills tissue, physiological indices

ARCUDA STATION (JOIȚA - GIURGIU, ROMANIA) AS SUITABLE AREA FOR PROTECTED BIRD SPECIES

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Our ornithological study presents data obtained through two monitoring campaigns performed between the years 2021 – 2013, respectively, 2018 – 2019 in the perimeter of Arcuda Station for Drinking Water Treatment and Production. We identified 111 bird species on the investigated territory, but in this study, we analyses the relevance of the Arcuda Station area for the recorded 20 bird species that present European and/or national protection status. Between them, 17 bird species appear in Annex 1 to the Birds Directive as species that need special conservation measures concerning their habitats in order to ensure their survival and the reproduction in their distribution range. Eight bird species appear in the Romanian Red Book of Vertebrates: *Tadorna ferruginea, Egretta garzetta, Nycticorax nycticorax, Ciconia ciconia, Pernis apivorus, Streptopelia turtur, Jynx torquilla* and *Corvus corax*.

DIVERSITY OF EPIGEOUS FAUNA FROM ANTHROPOGENIC IMPACTED FORESTS

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In the last 30 years, in the mountain areas of Romania a worrying phenomenon took place if we refer to the state of forest conservation - the clearing of extensive areas without the application of some elementary recovery measures imposed by the forestry code. Large areas of land, practically slopes or entire mountains were exploited by clear cuts reminiscent of the similar phenomenon that took place in the 1950s - 1960s during the Sovrom periods. The southern slope of the Fagaras Mountains in the north of Arges County is one of these areas. In 2019, within a project of ecological reconstruction of forest areas we carried out a monitoring program of epigeous fauna from different types of habitats, using the method of mowing in vegetation, traps for epigeous fauna and Winkler method. After processing of the data were identified groups of invertebrates from grasslands and epigeous fauna and was analyzed the correlation of fauna structure with habitat type - spruce forests in monoculture, mixed forests, totally deforested areas, and areas of windfalls. The results, correlated with data from control forest habitats, allowed both the analysis of the way in which the removal of woody vegetation had on different taxonomic groups and the way in which invertebrate fauna is reconfigured in reforestation processes.
Keywords: biodiversity, forest habitats

THE EFFECT OF SPORES EXTRACTS WITH GREEN SYNTHESIZED BIMETALLIC NANOPARTICLES ON *CUCUMIS SATIVUS* L.

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The development of nanotechnologies represents a promising way to improve sustainable agriculture because nanoparticles can be used as fertilizers, fungicides, herbicides, insecticides, can reduce the stress caused by various factors (salinity) or can be used for seed priming. Green synthesis is an important method to produce nanoparticles due to the lack of toxic waste and because is relatively simple and cheap. However, nanoparticles have unique properties that influence their bioavailability, bioaccumulation, and toxicity. Because of this ecotoxicological research, which studies the effect of nanoparticles on plants are important. In this study, we determined the effect of spore extracts with green synthesized bimetallic nanoparticles on cucumber. For obtaining the extracts, we used spores from two species of ferns (Asplenium scolopendrium and Dryopteris filix-mas) and two types of solvents (water and hydroalcoholic solution). The bimetallic nanoparticles (Au:Ag 1:1 and Au:Ag 1:10) were synthesized using $HAuCl_4$ and $AgNO_3$. The extracts were tested in Cucumis sativus seeds after being diluted 10 and 100 times, respectively. Exposure of Cucumis sativus seeds to aqueous extracts of A. scolopendrium and D. filix-mas spores with and without bimetallic nanoparticles has usually stimulated root growth, while the stem growth was stimulated only at the variants without bimetallic nanoparticles. For the hydroalcoholic extracts, at the variants with extracts with bimetallic nanoparticles diluted 100 times were obtained

better results than in control with water or with hydroalcoholic solutions.

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Keywords: extracts, green synthesis, bimetallic nanoparticles, cucumber

EPIGEOUS FAUNA FROM DEFORESTED AREAS - VALEA VALSANULUI CASE STUDY

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Vâlsanului Valley is one of the most famous areas in Romania in terms of importance for conservation because in this area is the only known population of the relict species *Romanichthys valsanicola*. Located in the south part of the Făgăraș Massif, the Vâlsan Valley has been affected in the past by hydro-development and timber exploitation projects, and in the last 30 years it has suffered in its upper part from the deforestation of large areas. The clear-cut areas are situated on the eastern slope, at altitude of over 1000 meters. In the deforested areas, a process of ecological reconstruction through reforestation is currently taking place. In a monitoring project carried out between 2019 and 2020, we analyzed the component of the invertebrate fauna from the epigeous layer and the grassy vegetation. The results allowed the evaluation of the impact of deforestation on invertebrate fauna and how reforestation can lead to the restoration of typical associations for unaffected areas.

Keywords: diversity, forest habitats, deforested areas

PROMISING BRASSICA TRAITS FOR MULTIPURPOSE USES OVERVIEW AND STEPS TO IMPROVE CROPS COMPETITIVENESS

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Brassica species have significant roles in meeting the food and nutritional security in European agricultural contexts as well as on a global scale. The exploitation of their genetic resources has far-reaching benefits in terms of formulating climate-resilient cultivars addressed to sustainable production systems under the current and future scenarios of climate change. In the last decades, many diseases were associated to the lifestyle, especially to food quality, researchers' attention was guided to find alternative sources in nature. Nowadays, a large range of crops have been identified to play an important role in different industries as: food, pharmaceutics, cosmetics, medicinal, etc. Species from Brassicaceae family are valuable resources thanks to their nutritional quality. Some of its cultivars, particularly in broccoli, cabbage, and kale, are great source of vitamins, fibre, and secondary metabolites such as carotenoids, phenols and glucosinolates, which are well known for their antioxidant activity and for their anti-carcinogenic attributes. This work contributes to an overview of origin, taxonomy, botanical characteristics, traditional and contemporary uses, as well as pharmacology uses of brassica species.

Keywords: nutrients, taxonomy, anticancer, antioxidant, anti-inflammatory, vitamins, proteins

INFLUENCE OF ENVIRONEMNTAL FACTORS CONCERNING THE QUALITY OF HONEY BEE

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The varying components in honey are attributed to different honey bee species, nectar plants, geographical regions, harvesting and processing strategies, storage conditions and times and other factors like environmental conditions. Honey has various bioactivities due to its nutritional components. Honey components mainly include glucose, fructose, sucrose, organic acids, amino acids, various flavour compounds, pigments, moisture, maltose and higher sugars. The antibacterial activity of honey is attributed to the presence of hydrogen peroxide, the total polyphenol content, flavonoids and other special substance, in addition to the high osmotic pressure exerted by the high sugar content in honey. Different types of honey have different antibacterial activities.

In our study we hypothesize that the wild honey had high antibacterial activity to defend against degradation. The results showed that there were significant differences among physico-chemical properties, proteins and plant sources of honey samples from different honey bee species.

The differences in antibacterial activity were attributed to differences in the botanical sources, entomological proteins of the honey. The species specific proteins in honey from each species can be used for their identification

Keywords: wild honey, flavor compounds, antibacterial activity