

**The Museum of Oltenia Craiova
Natural Sciences Department**

**THE SCIENTIFIC INTERNATIONAL
CONFERENCE**

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NATURAL SCIENCES DEPARTMENT

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PROGRAMME

**THE SCIENTIFIC INTERNATIONAL CONFERENCE
MUSEUM AND SCIENTIFIC RESEARCH**

Thursday the 17th of September

**THE MUSEUM OF OLTENIA CRAIOVA
NATURAL SCIENCES DEPARTMENT**

**THE OFFICIAL OPENING
10⁰⁰ – 10³⁰**

**PLENUM PRESENTATIONS
10³⁰ – 11¹⁵**

**WORKS ON SECTIONS
12⁰⁰ – 16⁰⁰**

Thursday the 17th of September

**OFFICIAL OPENING
10⁰⁰ – 10³⁰**

THE MUSEUM OF OLTENIA CRAIOVA

❖ **Opening speech:**

- **PhD. Florin RIDICHE** - Manager of the Museum of Oltenia Craiova

❖ **Inaugural speech:**

- **Ion PRIOTEASA** – President of Dolj County Council
- **Sina Niculina COSMULESCU** – Dean of the Faculty of Horticulture of the University of Craiova
- **Emilia FLOREA** – Manager of the County Center for Nature Protection, Tourism and Sustainable Rural Development, Dolj
- **Aurelian POPESCU** – Head of Natural Sciences Department - The Museum of Oltenia Craiova

PLENUM PRESENTATIONS

10³⁰ – 11¹⁵

Chaired by: CODREA Vlad, PhD. - “Babeş Bolyai” University, Cluj-Napoca, Romania

DERJANSCHI Valeriu, CHIRIAC Ion

New and less known true bug species (Hemiptera: Heteroptera) in the fauna of the Republic of Moldova / Specii noi și puțin cunoscute de heteroptere (Hemiptera: Heteroptera) în fauna Republicii Moldova

PETRIȘOR Alexandru-Ionuț, SKOCZYLAS Michal M.

Environmentalism, zoology, & ecology: from attitudes to science / Ecologism, zoologie și ecologie: de la atitudine la știință

WORKS ON SECTIONS

SECTION I – GEOLOGY

12⁰⁰ – 16⁰⁰

Chaired by: CODREA Vlad, PhD. - “Babeş Bolyai” University, Cluj-Napoca, Romania

ORAL PRESENTATIONS

ASIMOPOLOS Laurentiu, ASIMOPOLOS Natalia-Silvia, BALEA Bogdan, ASIMOPOLOS Adrian-Aristide

Numerical experiments about forecast of strong geomagnetic disturbances / Experimente numerice privind prognoza perturbațiilor geomagnetice puternice

ASIMOPOLOS Natalia-Silvia, ASIMOPOLOS Laurentiu, BALEA Bogdan, ASIMOPOLOS Adrian-Aristide

A statistical survey of geomagnetic indices in Solar Cycle 23 / Studiul statistic al indicilor geomagnetici din Ciclul Solar 23

CULESCU Flori, GHENCIU Monica

Particular petrographic types of pebbles in the Lower Pleistocene gravels of the Cotmeana Piedmont / Tipuri petrografice particulare de galetți în pietrișurile pleistocen-inferioare din Piemontul Cotmeana

STELEA Ion, GHENCIU Monica

The evolution of structural knowledge of the South Carpathians reflected by old geological maps (1890-1940) / Evoluția cunoașterii structurale a Carpaților Meridionali reflectată în hărți geologice vechi (1890-1940)

MACOVEI Monica, DANCIU Iulia, NICOLAE Constantin, SEBERĂDOI Oana, GRIGORE Dan

Preliminary evaluation of the Abator Quarry – Hârșova, Romania – a proposal for a new geosite / Evaluare preliminară a Carierei Abator - Hârșova, România – o propunere de înființare a unui nou geosit

GRIGORE Dan

Species of Taramelliceratinae Spath (*Metahaploceras*, *Hemihaploceras*, *Fontannesiella*) from the Upper Jurassic deposits of Hăghimaș Mts. (the Eastern Carpathians – Romania) / Speciile de Taramelliceratinae Spath (*Metahaploceras*, *Hemihaploceras*, *Fontannesiella*) din depozitele Jurasicului superior din Munții Hăghimaș (Carpații Orientali - România)

ENACHE Constantin, POPESCU Aurelian

The cretaceous limestones with Requiieniidae from Godeanu quarry (Mehedinți county, SW Romania) / Calcarele cretacee cu requieniidae din cariera Godeanu (jud. Mehedinți, SV României)

TRIF Nicolae, CODREA Vlad

First report of *Lates*, Cuvier 1828 (Actinopterygii, Perciformes) in Romania / Prima semnalare a genului *Lates* Cuvier 1828 (Actinopterygii, Perciformes) în România

VERESS László, CODREA A. Vlad

A freshwater softshelled turtle in the Albești Limestone / O țestoasă cu 'carapace moale' din Calcarul de Albești

SECTION II – VEGETAL BIOLOGY

The Natural Sciences Department

12⁰⁰ – 16⁰⁰

Chaired by: ȚÎȚEI Victor, PhD. - “Alexandru Ciubotaru” National Botanical Garden (Institute), Chișinău, Republica Moldova

ORAL PRESENTATIONS

BOIU-SICUIA Oana-Alina, BARBU Lavinia Diana Nicoleta, DIACONU Aurelia, PARASCHIV Alina, CORNEA Călina Petruța

Beneficial yeasts with biocontrol potential against sweet potato storage pathogens / Drojdii benefice cu potențial de biocontrol asupra patogenilor de depozit ai cartofului dulce

MOISE George

Use of the Crop Circle ACS-430 device for identifying the NDVI green index in a corn culture in the Sibiu county, Romania / Utilizarea aparatului Crop Circle ACS-430 pentru identificarea indicelui de verde NDVI, într-o cultură de porumb din județul Sibiu, România

ȚÎȚEI Victor

Some biological peculiarities and the economical value of the species *Pennisetum glaucum* in the Republic of Moldova / Unele particularități biologice și valoarea economică a speciei *Pennisetum glaucum* în Republica Moldova

ȚÎȚEI Victor

The prospects of the cultivation and use of the species *Amaranthus hypochondriacus* in Moldova / Perspectiva de cultivare și valorificare a speciei *Amaranthus hypochondriacus* în Moldova

POSTER PRESENTATIONS

P1. CROITORU Mihaela, DIACONU Aurelia, COTEȚ Gheorghe, DRĂGHICI Reta, DIMA Milica, DRĂGHICI Iulian

Research on the influence of irrigation on the nutritional quality of the sweet potato in the conditions of the sandy soils in the south of Oltenia / Cercetări privind influența irigației asupra calității nutriționale a cartofului dulce în condițiile solurilor nisipoase din sudul Olteniei

P2. DIMA Milica, DIACONU Aurelia, DRĂGHICI Reta, CROITORU Mihaela, STURZU Rodica

The effect of climate conditions on the growth and development of peanuts (*Arachis hypogaea*) on sandy soils from southern Oltenia / Efectul condițiilor climatice asupra creșterii și dezvoltării arahidelor (*Arachis hypogaea*) pe solurile nisipoase din sudul Olteniei

P3. MIHĂESCU Cristina, DIN Alin

The distribution of the *fleack virus* in naturally infected vine /
Distribuția virusului *fleack* la vița-de-vie infectată natural

P4. SFÎRLOAGĂ Loredana Mirela, ARDELEAN Ioan, DIACONU Aurelia, CROITORU Mihaela

Increasing the chemical parameters of soil and physiological characteristics of the *Romec 554j* tomato variety by extraradicular treatments with the inoculum of cyanobacteria and microalgae /
Creșterea parametrilor chimici ai solului și a trăsăturilor fiziologice ale tomatelor, soiul *Romec 554j* prin tratamente extraradiculare cu inocul de cianobacterii și microalge

SECTION III – ANIMAL BIOLOGY – INVERTEBRATES

The Natural Sciences Department

12⁰⁰ – 16⁰⁰

Chaired by: DERJANSCHI Valeriu, PhD. - Institute of Zoology, Chisinau, Republic of Moldova

VRABIE Valeria, PhD. Hab. - The Institute of Physiology and Sanocreatology, Chisinau, Republic of Moldova

ORAL PRESENTATIONS

VRABIE Valeria, CIOCHINĂ Valentina, DERJANSCHI Valeriu, ROTARU Stela

The content of polyphenols and antiradical activity of propolis, pollen and honey /
Conținutul polifenolilor și activitatea antiradicalică a propolisului, polenului și mierii

MOCREAC Nadejda

Tomostethus nigritus F. (Hymenoptera, Tenthredinidae) – a new pest species of ash tree in the Republic of Moldova /
Tomostethus nigritus F. (Hymenoptera, Tenthredinidae) – specie nouă de dăunător al frasinului în Republica Moldova

STANCĂ-MOISE Cristina, BLAJ Robert

Control of the *Hylobius abietis* L. (Coleoptera: Curculionidae) pest during 2010-2019, within the Miercurea Sibiului Forest District /
Controlul dăunătorului *Hylobius abietis* L. (Coleoptera: Curculionidae)

în perioada anilor 2010-2019, în cadrul Ocolului Silvic Miercurea Sibiului

MIHAILOV Irina, MOCREAC Nadejda

List of the rove beetles (Coleoptera, Staphylinidae) from several museum collections from the Republic of Moldova / Lista stafilinidelor (Coleoptera, Staphylinidae) din câteva colecții muzeale din Republica Moldova

STANCĂ-MOISE Cristina, BLAJ Robert

New research on the evolution of *Lymantria monacha* L. (Lepidoptera, Lymantriidae) in the conditions of the year 2019 and the control of the pest population within the Miercurea Sibiului Forest Range (Romania) / Noi cercetări cu privire la evoluția speciei *Lymantria monacha* L. (Lepidoptera, Lymantriidae) în condițiile anului 2019 și controlul populației dăunătorului în cadrul Ocolului Silvic Miercurea Sibiului (România)

LILA Gima

Preliminary data on mite species in beetles from different ecosystems in the Dolj county collected in 2020 / Date preliminare privind specii de acarieni la coleoptere din diferite ecosisteme din județul Dolj colectate în anul 2020

POSTER PRESENTATIONS

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Results of helminthological analysis of the complexes of phytoparasitoid nematodes, associated in peach orchards in the Republic of Moldova / Rezultatele analizei helmintologice ale complexelor de nematode fitoparazite asociate, în livezile de piersic din Republica Moldova

P6. IURCU-STRAISTRARU Elena, TODERAȘ Ion, BIVOL Alexei, RUSU Ștefan, SASANELLI Nicola, GLIGA Olesea, ANDONI Cristina

Impact research on fertilization and crop management on invasive cyst-forming nematode complexes of *Heterodera schachtii* Schmidt species on experimental sugar beet fields in the Republic of Moldova / Studiul de impact asupra fertilizării și managementului culturilor pe complexe de nematode invazive ale speciei *Heterodera schachtii* Schmidt, pe câmpuri experimentale de sfeclă de zahăr, în Republica Moldova

P7. MARNICHE Faiza, BENHAMACHA Mounira, SADALLAH Abderraouf, MILLA Amel, BOUGHELIT Nadia, YAHIA Nadia, LALOUI Fatiha, MEDKOUR Manel

The parasitoid hymenoptera associated with different animals corpses in Algeria / Himenoptere parazitoide asociate cu diferite cadavre de animale în Algeria

P8. GOGA Ionelia Claudia, MITITELU-IONUȘ Oana

Haematophagous parasites detected on fish stocks from the small reservoirs within Oltenia Plain (Romania) / Paraziți hematofagi întâlniți la populații piscicole din lacurile mici de baraj din Câmpia Olteniei (România)

P9. RUSU Ștefan

Diversity of parasitic fauna in wild boars from the Reservation “Pădurea Domnească”, Republic of Moldova / Diversitatea parazitofaunei la mistreți din Rezervația Naturală „Pădurea Domnească”, Republica Moldova

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New species of Collembola (Hexapoda) from the Republic of Moldova / Specii de Collembola (Hexapoda) noi pentru Republica Moldova

P11. BOUGUessa Slim, BOUGUessa-CHERIAK Linda, MERAIHI Hichem

Odonates from a few wadis in El Aouinet region North of Tebessa (extreme East of Algeria) / Odonatele din câteva văi seci din regiunea El Aouinet, la nord de Tebessa (estul extrem al Algeriei)

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Cucullia fraterna Butler, 1878 (Lepidoptera, Noctuidae) – a new species in the fauna of Republic of Moldova / *Cucullia fraterna* Butler, 1878 (Lepidoptera, Noctuidae) – specie nouă în fauna Republicii Moldova

P13. ȚUGULEA Cristina, ȚUGULEA Andrian

Contributions to knowledge on the fauna of hawk moths (Lepidoptera, Sphingidae) from the Republic of Moldova / Contribuții la cunoașterea faunei sfingidelor (Lepidoptera, Sphingidae) din Republica Moldova

P14. BERLAJOLLI Violeta, PŁÓCIENNIK Mateusz, PESIC Vladimir, BERLAJOLLI Xhemajl

Chironomidae of the Cursed Mountains (Bjeshkët e Nemuna National Park) / Chironomidele din Munții Blestemați (Parcul Național Bjeshkët e Nemuna)

**SECTION III – ANIMAL BIOLOGY – VERTEBRATES
THE NATURAL SCIENCES DEPARTMENT**

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Chaired by: GACHE Carmen, PhD. - “Al. I. Cuza” University of Iasi, Romania

ORAL PRESENTATIONS

GACHE Carmen

Evolution of the bird fauna diversity in the perimeter of the Arcuda Station (Joița - Giurgiu, Romania) / Evoluția diversității ornitofaunei în perimetrul stației Arcuda (Joița – Giurgiu), România

RIDICHE Mirela Sabina

New observations regarding the aquatic avifauna from ROSPA0010Bistreț (South-West Romania) / Observații noi privind avifauna acvatică din ROSPA0010Bistreț (S-V României)

PAIU Romulus-Marian, MURARIU Dumitru

First record of an entirely white harbour porpoise (*Phocoena phocoena relicta* ABEL 1905) in Romanian Black Sea waters after 27 years

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Newts and fish in the remnants of former wetlands from the North-Eastern Romania in front of the same enemy / Tritoni și pești în rămășițele vechilor mlaștini din nord-estul României, în fața aceluiași inamic

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Feeding in cold weather: food composition of a *Salamandra salamandra* (Amphibia) population from the Iron Gates Natural

Park, Romania, in early march / Hrănire în vreme rece: compoziția hranei unei populații de *Salamandra salamandra* (Amphibia) din Parcul Natural Porțile de Fier, România, la început de martie

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Considerations regarding the comparative dynamics of the avifauna in two aquatic natural protected areas from South-Western Romania / Considerații privind dinamica comparativă a avifaunei din două arii acvatice naturale protejate, din sud-vestul României

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Considerations on the density, preference of habitat and ethology of the pygmy owl (*Glaucidium passerinum*) from the Făgăraș, Iezer-Păpușa and Leaota mountains (Southern Carpathians, Romania) / Considerații despre densitatea, preferința de habitat și etologia ciuvcii (*Glaucidium passerinum* Linnaeus, 1758) din Munții Făgăraș, Iezer-Păpușa și Leaota (Carpații Meridionali, România)

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Iron Gates Natural Park – a chiropterological hotspot in South-Western Romania

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Ecological and epizootological features of small mammals (Mammalia: Soricomorpha, Rodentia) as reservoir of leptospira in the Republic of Moldova / Unele date privind aspectele ecologice și epizootologice a comunităților mamiferelor mici (Mammalia: Rodentia)

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The demographic structure of *Microtus arvalis* and *Microtus rossiaemeridionalis* (Mammalia, Rodentia, Cricetidae) populations in agrocenoses from the Republic of Moldova / Structura demografică a populațiilor *Microtus arvalis* și *Microtus rossiaemeridionalis* (Mammalia, Rodentia, Cricetidae) în agrocezoze din Republica Moldova

P22. ILIE Aurelian Leonardo, MARINESCU Mariana, GOGA Ionelia Claudia

Rodent fauna (Mammalia, Rodentia) from the Tinca area (Bihor county, Romania) / Speciile de rozătoare (Mammalia, Rodentia) din zona Tinca (județul Bihor, România)

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The Natural Sciences Department

12⁰⁰ – 16⁰⁰

Chaired by: Alexandru-Ionuț PETRIȘOR, Ph.D. – “Ion Mincu” University of Architecture and Urbanism, Bucharest, Romania

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MARINICĂ Andreea Floriana, MARINICĂ Ion, CHIMIȘLIU Cornelia

Mediterranean winter 2019-2020 in southwestern Romania in the context of climate changes / Iarna mediteraneeană 2019-2020 în sud-vestul României în contextul schimbărilor climatice

CISMAȘIU Carmen-Mădălina, CÎRSTEA Doina Maria, CIOBOIU Olivia

The recovery of noble metals with microorganisms: basic and applied importance / Recuperarea metalelor nobile cu ajutorul microorganismelor: importanța fundamentală și aplicativă

ENACHE Mădălin, COJOC Roxana, NEAGU Simona, RUGINESCU Robert, LUCACI Ioana, GOMOIU Ioana

Novel records of endolithic microbial communities in the Piatra Verde gypsum resources of Slănic Prahova / Date noi privind comunitatea microbială endolitică în resursele de gips Piatra Verde din zona Slănic Prahova

RUGINESCU Robert, COJOC Roxana, NEAGU Simona, LUCACI Ioana, ENACHE Mădălin

Insights into the Atacama desert microbiology: cultivation of halophilic bacteria from salt rocks and their biotechnological

potentialities / Perspective asupra microbiologiei deșertului Atacama: cultivarea bacteriilor halofile din roci de sare și potențialul lor biotehologic

VOICU Diana, NEAGU Simona, RUGINESCU Robert, ENACHE Mădălin

Ocimum basilicum L. antimicrobial potential correlated with developmental stage and cultivar type / Potențialul antimicrobian la *Ocimum basilicum* L. corelat cu stadiul de dezvoltare și genotipul acestuia

GHEORGHIEVICI Liana Manuela, COSMOIU Mădălina, POMPEI Iulia, GHEORGHIEVICI Gavril-Lucian

Nutritional particularities of pathogenic conditioned microorganisms from the microbiota of the therapeutic waters / Particularități nutriționale ale microorganismelor condiționat patogene din microbiota apelor terapeutice

GAVRILESCU Elena, CIOBOIU Olivia, MĂRĂCINEANU Liviu Cristian

The physical, chemical and biological status of water bodies in the Jiu river catchment area / Starea fizico-chimică și biologică a corpurilor de apă din bazinul hidrografic Jiu

CISMAȘIU Carmen Mădălina, CIOBOIU Olivia, GAVRILESCU Elena

The use of microorganisms and invertebrates in the removal of metallic ions from natural substrates: fundamental and applied aspects / Utilizarea microorganismelor și nevertebratelor la îndepărtarea ionilor metalici din substraturi naturale: aspecte fundamentale și aplicative

CIOBOIU Olivia, CISMAȘIU Carmen-Mădălina, GAVRILESCU Elena, BREZEANU Gheorghe

An integrative study on the structure of biodiversity from lacustrine ecosystems in the floodplain of the Danube / Studiu integrativ privind structura biodiversității ecosistemelor lacustre din zona inundabilă a Dunării

CHIRIAC Luiza-Silvia, MANU Minodora, CIOBOIU Olivia, ONETE Marilena

The plants-soil invertebrates relationship - a brief review / Relația plante-nevertebrate din sol – o scurtă trecere în revistă

DĂNĂILĂ-GUIDEA Silvana-Mihaela, DELIAN Elena, POPESCU Paul-Alexandru, BURNICHI Floarea, HANGU Bogdan, DOBRINOIU Ricuța-Vasilica, DRĂGHICI Mihaela-Cristina, POPA Elisabeta Elena, VIȘAN Valerica Luminița, POPA Mona Elena

The investigation of the biological response due to the cultivation in protected areas of tomato plants illuminated with led light, through physiological determinations at leaf level / Investigarea răspunsului biologic datorat cultivării în spații protejate al plantelor de tomate iluminate cu lumină led, prin determinări fiziologice la nivel foliar

PETRIȘOR Alexandru-Ionuț

The long term dynamics of urban green spaces in Romania / Dinamica spațiilor verzi în România pe termen lung

POSTER PRESENTATIONS

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The corrosion of zirconium alloys influenced by aerobic and anaerobic bacteria / Coroziunea aliajelor zirconiului influențată de bacterii aerobe și anaerobe

P25. GHINEA Adrian, ARDELEAN I. Ioan, IACOB Matei-Tom, BĂLAN Adriana, STAMATIN Șerban, MOISESCU Cristina

The bioreductive synthesis of platinum nanoparticles by *Shewanella oneidensis* MR-1 / Sinteza bioreductivă a nanoparticulelor de platină de către *Shewanella oneidensis* MR-1

P26. IACOB Matei-Tom, ARDELEAN I. Ioan, GHINEA Adrian, MOISESCU Cristina, BĂLAN Adriana, STAMATIN Șerban

Microbial fuel cells as devices for online monitorig of *Shewanella oneidensis* growth under aerobic conditions / Pilele de combustie microbiene: dispozitive pentru monitorizarea directă a creșterii *Shewanella oneidensis* în condiții anaerobe

P27. ARDELEAN Ana-Valentina, GHEORGHITĂ Alina, MOISESCU Cristina, NEGUȚ Daniel, ARDELEAN I. Ioan

The influence of gamma irradiation on the growth and biochemical composition in *Synechocystis* PCC 6803 and *Chlorella sorokiniana* UTEX 1230 / Influența iradierii gamma asupra creșterii și

compoziției biochimice la *Synechocystis* PCC 6803 și *Chlorella sorokiniana* UTEX 1230

P28. BOIU-SICUIA Oana-Alina, MALO (DALANAJ) Nereida, CORNEA Călina Petruța

Microbial characterisation of some bacterial endophytes isolated from *Vicia faba* L. seeds / Caracterizarea microbiologică a unor bacterii endofite izolate din semințe de *Vicia faba* L.

P29. HADDADJ Fairouz, HAMDI Sihem, ZENIA Safia, SMAI Amina, MILLA Amel, CHORFI Nassima, DOUMANDJI-MITICHE Bahia

The effect of the entomopathogenic fungus *Metarhizium anisopliae* on the eggs of the desert locust *Schistocerca gregaria* (Forskål, 1775) / Efectul fungului entomopatogenic *Metarhizium anisopliae* pe ouăle lăcustei de deșert *Schistocerca gregaria* (Forskål, 1775)

P30. PURICE Dorina-Marieta, CIOBOIU Olivia

The diversity of the invertebrates from the Prahova River Valley and Doftana river valley. A review of current knowledge / Diversitatea nevertebratelor văilor râurilor Prahova și Doftana. Un review al stadiului actual de cunoaștere

P31. VICOL Ioana

The relationship between the intensity of vehicle traffic and accumulation of chemical elements in lichen *Xanthoria parietina* / Relațiile dintre intensitatea traficului rutier și acumularea elementelor chimice în *Xanthoria parietina*

P32. ULEANU Florina, VÎJAN Loredana Elena, VULPE Mădălina, SIMINEA Maria Irina, BRATU Ion Gabriel, GIOSANU Daniela

The influence of the culture substrate composition on some biometric and biochemical parameters of tomato seedlings - Inimă de bou / Influența compoziției substratului de cultură asupra unor parametrii biometrici și biochimici la răsăturile de tomate - Inimă de bou

P33. NEBLEA Monica, MARIAN Mădălina

Phytosociological considerations regarding siliceous screes from Meridional Carpathians (Romania) / Considerații fitosociologice asupra grohotișurilor silicioase din Carpații Meridionali (România)

PLENUM PRESENTATIONS

**NEW AND LESS KNOWN TRUE BUG SPECIES
(HEMIPTERA: HETEROPTERA) IN THE FAUNA
OF THE REPUBLIC OF MOLDOVA**

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Keywords: Heteroptera, new faunal data, Republic of Moldova.

The article presents data for 24 species of heteropteran that are new for the fauna of the Republic of Moldova. Also, it provides information on the collection settlements, habitats, as well as systematic and bioecological comments.

ENVIRONMENTALISM, SOZOLOGY & ECOLOGY: FROM ATTITUDES TO SCIENCE

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Internet: www.environmentmetrics.ro

Keywords: sustainability, conservation, politics, environment, epistemology.

The article attempts to provide a distinction between the two disciplines dealing with the environment (ecology) and its protection (sozology) and their interconnections, also focusing on the issue of environmentalism, which stands apart from the two sciences through its political nature. In analysing the dynamics of the two sciences, the discussion focuses on their development in Poland and Romania, underlining the most important contributions and contributors. The results emphasize the scientific grounds of ecology and sozology in contrast with environmentalism, especially in the modern times, and also highlight some differences between Poland and Romania, which are not exploited from a philosophical viewpoint.

ORAL PRESENTATIONS
GEOLOGY

NUMERICAL EXPERIMENTS ABOUT FORECAST OF STRONG GEOMAGNETIC DISTURBANCES

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Keywords: Neural networks, Fourier spectral deconvolution, autoregressive models, geomagnetic disturbances.

The presented numerical experiments belong to three different methodological categories, with the same purpose, but with different approaches. The common goal is the prediction of geomagnetic disturbances and the methodologies used comparatively are Fourier spectral deconvolution, autoregressive models on time series and recurrent Long Short Term Memory (LSTM) neural networks that are capable of long-term dependence. The data used in these experiments are the geomagnetic data recorded at the Surlari Geomagnetic Observatory as well as other planetary observatories located at different latitudes and longitudes. In the experiments we also used planetary geomagnetic indices, downloaded from specialized sites.

A STATISTICAL SURVEY OF GEOMAGNETIC INDICES IN SOLAR CYCLE 23

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Keywords: DST (disturbance storm time), AE (Auroral electroject),
ARIMA (autoregressive integrated moving average, geomagnetic storm).

Based on the planetary geomagnetic indices in the Solar Cycle 23, which corresponds to the period 1996-2008, we performed a set of statistical tests, focused especially on major geomagnetic storms. For the analysis of the geomagnetic indices sampled from hour to hour, we started by eliminating the linear trend, in order to be as close as possible to the conditions of the stationary time series. According to the Box-Jenkins methodology, for the analysis of stationary time series, we used the autoregressive model (AR), mobile mediation (MA), autoregressive moving averages (ARMA) and integrated autoregressive moving averages (ARIMA), with the main goal to determine the model with the best fit of geomagnetic indices. The data for which we calculated this type of models are the hourly values of DST (disturbance storm time) and AE (Auroral electroject), for the main geomagnetic storms in the Solar Cycle 23.

**PARTICULAR PETROGRAPHIC TYPES OF PEBBLES
IN THE LOWER PLEISTOCENE GRAVELS
OF THE COTMEANA PIEDMONT**

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Keywords: Cotmeana Piedmont, gravels, glaucophane, olivine, riebeckite.

There are very few petrographic studies on the Lower Pleistocene gravels of the Getic Piedmont and for those in the Cotmeana Piedmont this is the first. The study highlights an extremely varied range of petrographic types of pebbles. Among them, there are some petrographic types with particular mineralogical composition, very rare or without correspondent in the proximal Carpathian source area north of the piedmont. Three such petrographic types of pebbles are described in the paper: glaucophane rocks (actinolite and quartz type), olivine basalts and riebeckite trachytes. The same glaucophane rocks have recently been identified inside the Infracretic Complex (Severin Nappe) in the Parâng Mountains. Theoretically speaking, the source of the riebeckite trachytes could be the Liassic dykes complex in the Făgăraş Mountains where riebeckite syenite and bostonite are mentioned. The source area of the olivine basalts seems to be farther away. Such rocks outcrop inside the Quaternary Volcanics in the Perşani Mountains.

**THE EVOLUTION OF STRUCTURAL KNOWLEDGE
OF THE SOUTH CARPATHIANS REFLECTED
BY OLD GEOLOGICAL MAPS (1890-1940)**

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Keywords: structural knowledge, geological maps, South Carpathians.

Following the evolution of the structural knowledge of the South Carpathians, the paper reviews the geological maps from the late 19th and the early 20th centuries. The maps prior to 1910, when Murgoci published his famous structural synthesis of the South Carpathians, are lithological maps without structural interpretations. An exception is the 1899 map of the same author, where the future path of the Getic thrust in the central South Carpathians is rigorously prefigured by a low-angle reverse fault. Highlighting the Getic Nappe stimulated the development of structural studies in the South Carpathians orogen, especially regarding the crystalline basement of the nappe and the Getic and Infracretic sedimentary formations, sometimes leading to exaggerations about the areal extent and even the existence of some Supracretic nappes. In this context, the most important study is the work of Codarcea from 1940 regarding the Severin Nappe (the Getic para-autochthonous) in the Mehedinţi Plateau.

**PRELIMINARY EVALUATION OF THE ABATOR –
HÂRȘOVA QUARRY OF ROMANIA – A PROPOSAL
FOR A NEW GEOSITE**

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Keywords: paleontological site, Late Jurassic, ammonites, scientific value, ecotourism.

The Abator - Hârșova Quarry is part of the natural exposure of the Baroi Hill on the Danube bank, integrated in the ROSCI0022 “Canaralele Dunării” protected area. The present study represents a scientific reassessment, as well as an analysis of the ecotourism potential of this site. A series of geological and paleontological studies have been carried out in the region, without exactly defining all the areas of scientific but also practical interest. In its outcrops, the Abator Quarry provides numerous fossils of lower Oxfordian age, which are easily accessible, being located in the immediate proximity of the Hârșova town. Some of the fossils have index value, as is the case with the ammonites. Our analysis is focused on the scientific importance of the site and the approach of the sustainable exploitation of the touristic potential.

**SPECIES OF TARAMELLICERATINAE SPATH
(*METAHAPLOCERAS*, *HEMIHAPLOCERAS*,
FONTANNESIELLA) FROM THE UPPER JURASSIC
DEPOSITS OF THE HĂGHIMAȘ MTS.
(THE EASTERN CARPATHIANS – ROMANIA)**

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Keywords: Taramelliceratinae, palaeontology, Hăghimaș, Carpathians, Romania.

Species from the ammonites genera *Taramelliceras* and *Hemihaploceras*, from the Kimmeridgian-Tithonian deposits in Ghilcoș (Hăghimaș Mountains, Romania) are described and figured. *Taramelliceras* (*Metahaploceras*) *strombecki*, *T. (M.) nodosiusculum*, *T. karreri*, *Hemihaploceras* (*Hemihaploceras*) *nobile*, *H. (Zittelicerias) schwageri*, are species also described previously by NEUMAYR (1873), HERBICH (1878) and PREDA (1973), reviewed here. New species found during this study are added: *T. (M.) subnereus*, *T. (Fontannesiella)* nov.sp. aff. *T. (F.) valentinum*, *T. acallopistum*, *T. intersistens* and a rare species, *Hemihaploceras* (*H.*) *loczyi*, described only by JEKELIUS (1916) in the Bucegi Mountains.

**THE CRETACEOUS LIMESTONES WITH REQUIENIIDAE
FROM THE GODEANU QUARRY
(MEHEDINȚI COUNTY, SW ROMANIA)**

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Keywords: limestones, Godeanu quarry, Barremian-Aptian, *Requienia*, *Toucasia*, the Danubian Autochthonous.

Several limestone samples were collected from the limestone quarry located within the Godeanu village (Obârșia Cloșani commune, Mehedinți County, SW Romania) belonging to the Danubian Autochthonous, some of which proved to be fossiliferous. Following the paleontological examination, it was found that the fossils belong to the species *Toucasia carinata* MATHERON 1842 and *Requenia ammonia* (DOUVILLÉ) 1838, which are characteristic of the Barremian-Aptian.

FIRST REPORT OF *Lates*, Cuvier 1828 (ACTINOPTERYGII, PERCIFORMES) IN ROMANIA

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Keywords: fossil perch, Sarmatian, Vârciorog, fish, Pannonic Basin.

Although fossil fishes were previously reported in the Sarmatian deposits of Vârciorog (Bihar County, Romania), the fauna described exclusively based on otoliths does not include the *Lates* genus. Now, based on two dentary fragments, we make the first report of this genus of fish in Romania.

Lates has been known since the Oligocene, but its origins are older, probably coming from the *Eolates* genus, which was reported in the Eocene in Monte Bolca, Italy. It seems that *Lates* is a common presence in Europe, punctual reports being made in many sites, especially in the Miocene ones. The incomplete preservation of our specimens does not allow to identify the species. The number of lateral foramina and their arrangement in the dentary are taxonomic indicators, but unfortunately the preserved part is not extensive enough to include sufficient diagnostic features. This study underlines the necessity of an integrated type of study regarding the fish faunas (otoliths, bones, teeth) in order to complete the faunal structure of a paleontological site.

A FRESHWATER SOFTSHELLED TURTLE IN THE ALBEȘTI LIMESTONE

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Keywords: Trionychinae, turtle, middle Eocene, limestone, Albești, Romania.

This study focuses on a fragment of a soft-shelled turtle discovered in the Eocene deposits of the Albești Nummulitic Limestone, in Albești Muscel, in the former main open pit (Lutetian). It is the first detailed description of a freshwater turtle from this area. The comparison between the Albești turtle and *Trionyx clavatomarginatus* Lörenthey, 1903 allows for a taxonomic assignation to Trionychinae subfamily. An assignation to a genus and species cannot be done due to the scarcity of the preserved characters. Concerning the host rock, the optic microscopy indicates a granular bioclastic microfacies, caught in a detrital matrix, with terrigenous elements. From a micropaleontological standpoint, one can remark the presence of numerous large benthic foraminifera, as well as the fragments of echinoids and red algae. This micropaleontologic assemblage, along with the presence of fine extraclasts, suggests a depositional environment with high hydrodynamic energies and transport of terrigenous materials. The XRPD analysis shows the dominance of marcasite, followed by pyrite, calcite, quartz and calcopyrite. The presence of pyrite could demonstrate the existence of anoxic tendencies of the environment. Trionychids are indicative for the proximity of emerged areas, with freshwater lakes or slow flowing rivers. However, these turtles can swim along the marine coast, on certain distances. The abrasion marks on the fossil carapace are indicative of effects of hydrotaphonomy, in highly hydrodynamic environments, as well as quite long transport before burial.

VEGETAL BIOLOGY

BENEFICIAL YEASTS WITH BIOCONTROL POTENTIAL AGAINST SWEET POTATO STORAGE PATHOGENS

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Keywords: beneficial yeasts, *Metschnikowia* spp., sweet potato, biocontrol of storage fungal pathogens.

The sweet potato is less known in Romania. The highly different storage conditions between sweet potatoes (*Ipomoea batatas*, Convolvulaceae family) and potatoes (*Solanum tuberosum*, Solanaceae family) make it difficult to maintain the quality of the tubers during storage. Sweet potatoes are sensitive to relatively low temperatures (<12°C), which can produce chilling injuries. The wounds created by the cold can lead to over-infection with storage pathogenic fungi. In order to reduce the potential losses caused by storage fungal infections, we recommend the use of beneficial yeasts, with biocontrol activity. These yeasts were selected from the natural epiphytic microbiota and do not present toxicity risks to consumers. The selected isolates have shown inhibitory activity against the main storage pathogenic fungi of sweet potato: *Botrytis cinerea*, *Fusarium oxysporum*, *Penicillium* sp., *Rhizopus stolonifer* and *Sclerotium bataticola*.

**USE OF THE CROP CIRCLE ACS-430 DEVICE
FOR IDENTIFYING THE NDVI GREEN INDEX IN A CORN
CULTURE IN THE SIBIU COUNTY, ROMANIA**

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Keywords: measurements, corn cultivation, Crop Circle ACS-430.

The present study is part of a much larger research that took place over two years in a corn crop in the commune of Apoldu de Jos (Sibiu, Romania), starting from the idea that the same production can be obtained, only by fertilizing with urea in the preparation of the germination bed, and not when ammonium nitrate is applied in two passes, sowing and during the growing season of the crop. The present paper aimed to determine the green index by performing measurements in different phases of crop vegetation, correlated with the administration of urea and ammonium nitrate fertilizers, to the two experimental plots of corn V_1 and V_2 , using the device Crop Circle ACS-430, held by the Faculty of Agricultural Sciences, Food Industry and Environmental Protection within the Lucian Blaga University of Sibiu.

**SOME BIOLOGICAL PECULIARITIES
AND THE ECONOMICAL VALUE OF THE SPECIES
Pennisetum glaucum IN THE REPUBLIC OF MOLDOVA**

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Keywords: biochemical composition, biomethane potential, feed value, *Pennisetum glaucum*.

The aim of this study was to evaluate some biological peculiarities, the quality of green mass and silage from the non-traditional annual grass species *Pennisetum glaucum* grown in an experimental field of the National Botanical Garden (Institute), Chișinău, Republic of Moldova. It has been found that the dry matter of harvested whole plants contained 112 g/kg CP, 73 g/kg ash, 332 g/kg ADF, 591 g/kg NDF, 43 g/kg ADL; the feed value – 65.5 % DDM and 60.6% OMD with 10.19 MJ/kg ME and 6.27 MJ/kg NEL. The prepared silage was characterized by an agreeable color and a pleasant smell, with pH 4.23, it contained 17.7 g/kg DM lactic acid, 7.1 g/kg DM acetic acid, 915 g/kg organic matter, 112 g/kg CP, 337 g/kg ADF, 595 g/kg NDF, 29 g/kg ADL with 73.6 % DMD, 65.0% OMD, 11.74 MJ/kg ME and 7.07 MJ/kg NEL. The biochemical methane potential of investigated *Pennisetum glaucum* substrates was 337 - 360 l/kg ODM.

Pennisetum glaucum contains a lot of nutrients, which make it suitable to be used as an alternative feed for livestock and feedstock for renewable energy production.

**THE PROSPECTS OF THE CULTIVATION
AND USE OF THE SPECIES *Amaranthus hypochondriacus*
IN MOLDOVA**

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Keywords: *Amaranthus hypochondriacus*, biochemical composition, feed value, renewable energy.

The goal of this research was to evaluate the quality of seeds and phytomass of the non-native species *Amaranthus hypochondriacus* grown in an experimental field of the National Botanical Garden (Institute), Chișinău, Republic of Moldova. It has been found that the prepared silage was characterized by pleasant smell, its pH was 3.86, it contained 13.4 g/kg DM lactic acid, 5.8 g/kg DM acetic acid, 167 g/kg CP, 348 g/kg ADF, 516 g/kg NDF, 45 g/kg ADL, 158 g/kg HC, 303 g/kg Cel, with feed value RFV=111, 10.05 MJ/kg ME and 6.02 MJ/kg NEL. The biochemical methane potential of the silage substrate made from *Amaranthus hypochondriacus* reached 302 l/kg ODM. The *Amaranthus hypochondriacus* seeds contained 180.8 g/kg protein, 82.3 g/kg fats, 53.2 g/kg crude fibre, 657.4 g/kg nitrogen free extract, 2.5 g/kg calcium and 2.0 g/kg phosphorus, the stalks contained 293 g/kg HC and 404 g/kg Cel. The theoretical ethanol potential from structural carbohydrates of the stalks averaged 421 L/t. The stalk biomass was characterised by moderate calorific values (18.0 MJ/kg) and ash content (2.3 %), the specific density of solid bio fuel, namely briquettes, reached 901 kg/m³.

Amaranthus hypochondriacus can be exploited in many ways: as pseudo-grain and fodder and as feedstock in the production of renewable energy.

ANIMAL BIOLOGY
INVERTEBRATES

THE CONTENT OF POLYPHENOLS AND ANTIRADICAL ACTIVITY OF PROPOLIS, POLLEN AND HONEY

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Keywords: propolis, pollen, honey, polyphenols, antiradical activity.

The correlation between total polyphenol content and antiradical activity in propolis, pollen and honey in aspect of their therapeutic uses and the elaboration of new healthy products was investigated. It has been established that the antioxidant potential of the studied bee products largely depends on the content of the polyphenols that determine their antiradical activity. Thus, a high correlation between the polyphenols content and the antiradical activity was established for the ethanol and aqueous extract of propolis. In terms of both total polyphenol content and antiradical capacity, the greatest values are found in acacia pollen, followed by poly flower, then sunflower pollen. The investigation of the polyphenol content and the antiradical activity of honey samples revealed the greater antioxidant potential of the acacia honey, in terms of antiradical activity and of sunflower honey, in terms of polyphenol content. The data obtained allow us to state the possibility of targeted use of the varieties of beekeeping products in the elaboration of new healthy remedies with predetermined content and properties by modeling the content of their active components.

***Tomostethus nigritus* F. (HYMENOPTERA, TENTHREDINIDAE)
– A NEW PEST SPECIES
OF ASH TREE IN THE REPUBLIC OF MOLDOVA**

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Keywords: ash tree black sawfly, Tenthredinidae, ash tree, outbreaks, defoliations, Republic of Moldova.

In the Republic of Moldova, the ash tree is a common forest species, used in the reforestation and afforestation of woods and territories, and widely used as an ornamental tree in cities and along roads. For more than ten years, our ash tree woods have been severely defoliated by the ash weevil *Stereonychus fraxini* (De Geer, 1775) from Curculionidae family. In the vegetation period of 2018 and 2019, defoliation was seen on ash trees, caused by unknown sawfly larvae species from the Tenthredinidae family. The analyses showed that these pests belong to the Hymenoptera order – the privet sawfly – *Macrophya punctumalbum* (Linnaeus, 1767), and *Tomostethus nigritus* (Fabricius, 1804), the last one being a new species for the fauna of the Republic of Moldova. The biggest ash defoliations caused by the *Tomostethus nigritus* larvae were recorded in the centre of the country, especially in the Nisporeni and Tighina Forest Enterprises and in the “Plaiul Fagului” Scientific Reserve, as well as in the urban space.

CONTROL OF THE *Hylobius abietis* L. (COLEOPTERA: CURCULIONIDAE) PEST DURING 2010-2019, WITHIN THE MIERCUREA SIBIULUI FOREST DISTRICT

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Keywords: *Hylobius abietis*, conifer seedling, chemical protection.

The *Hylobius abietis* weevil (Linnaeus, 1758) is considered one of the most dangerous pests of softwood forests, attacking in particular spruce, pine, fir, larch and Douglas fir. The appearance of this pest in the perimeter of the studied surface occurred after the felling of the conifers, but the presence of the pest was especially noted in young seedlings. Within the Miercurea Sibiului Forest District, this pest was detected during the period 2010-2019 on an area of 925.93 ha, in three production units – UP III Bistra, UP IV Ciban, UP V Pod. The protection of the forest fund in the area is essential to keep the evolution of this pest under control, and the following protection methods were used in the Miercurea Sibiului Forest District: for young seedlings in the new plantations, treatments with Mospilan 20 Sp, with a consumption norm of 0.2 kg/1000 seedlings and bark traps mounted on trees in the perimeter of the facility at the end of May of each year for mass capture of adults.

**LIST OF THE ROVE BEETLES (COLEOPTERA,
STAPHYLINIDAE) FROM SEVERAL MUSEUM
COLLECTIONS FROM THE REPUBLIC OF MOLDOVA**

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Keywords: scientific collections, staphylinid species, Coleoptera, Staphylinidae, Republic of Moldova.

The main purpose of the present paper was to offer a complete list of staphylinid species (Staphylinidae, Coleoptera) preserved in the entomological collections of some museums of public scientific institutions of the Republic of Moldova. In addition, we included rove beetle species which were documented as present on the territory of our country but their individuals were not found in any studied collections. We have investigated three entomological collections that are significant in terms of size and are very important for biodiversity, from the Republic of Moldova: the Collection of the Museum of Entomology within the Institute of Zoology, the Entomological Collection of the Institute of Physiology, Genetics and Plant Protection and the “N. Zubowsky” Entomological Collection of the NMENH. The specimens stored in these collections were collected in more than 220 collecting sites in different periods: 1917-1937, 1954-2020 and 1966-1999. The given list represents 261 rove beetle species, grouped in 12 subfamilies: Omaliinae, Proteininae, Tachyporinae, Habrocerinae, Aleocharinae, Oxytelinae, Oxyporinae, Scaphidiinae, Steninae, Paederinae, Staphylininae and Pselaphinae.

**NEW RESEARCH ON THE EVOLUTION
OF *Lymantria monacha* L. (LEPIDOPTERA,
LYMANTRIIDAE) IN THE CONDITIONS OF THE YEAR
2019 AND THE CONTROL OF THE PEST POPULATION
WITHIN THE MIERCUREA SIBIULUI FOREST RANGE
(ROMANIA)**

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Keywords: *Lymantria monacha* L., Miercurea Sibiului Forest District
(Sibiu county, Romania), pheromonal traps.

The Miercurea Sibiului Forest District administers an area of 14,911 ha forest fund public property of the state with an altitude ranging from 1100 to 1950 m. The following production units are included in the forestry fund (UP Bistra, UP IV Ciban, UP V Pod). From this surface, an area of 2970.4 ha, i.e. approximately 19.9%, was affected by pests (biotic and abiotic) in 2019; the infested area was maintained at the level of 2018. The present study is a continuation of the research carried out from the year 2011 and includes the analysis of the evolution of the defoliator *Lymantria monacha* L., 1758 under the conditions of 2019. Of the three monitored production units, where a set of 81 pheromone traps was installed, the largest number of butterflies of *Lymantria monacha* at a control point, during the entire observation period, was registered in UP III Bistra, the administrative unit 162B, where 64 specimens were captured.

**PRELIMINARY DATA ON MITE SPECIES IN BEETLES
FROM DIFFERENT ECOSYSTEMS IN THE DOLJ COUNTY,
COLLECTED IN 2020**

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Keywords: acarian, beetles, *Orictes nasicornis*, forest forms.

The research on the diversity of beetle mites in the Dolj County exposed in this paper was conducted in 2020. The biological material of beetles (3 specimens) was collected from terrestrial ecosystems (Craiova and Breasta). The hosts, from a systematic point of view, belong to the Coleoptera order and the Scarabaeidae family. The species on which forest forms have been found is *Orictes nasicornis* (Linnaeus 1758). From a systematic point of view, the mite identified pursuant to specialized research belongs to the *Macrocheles* sp. genus (Arachnida: Micrura: Acari: Mesostigmata: Macrochelidae: *Macrocheles*). This abstract presents data signalling the species of beetle and mites of the *Macrocheles* genus, and the results of laboratory research will be presented in a forthcoming paper.

ANIMAL BIOLOGY
VERTEBRATES

**EVOLUTION OF THE BIRD FAUNA DIVERSITY
IN THE PERIMETER OF THE ARCUDA STATION
(JOIȚA - GIURGIU, ROMANIA)**

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Keywords: bird fauna, dynamic, urban green areas.

We performed this ornithological study through the monitoring of bird fauna on the territory of the Arcuda Station in two periods, i.e. 2012-2013 and 2018-2019. We identified 111 bird species during our study in this perimeter. We notice a slight decrease in the diversity of birds from 100 species recorded during 2012- 2013 to 95 species during 2018-2019. We also present quantitative data for breeding bird species, mentioning their dynamics from one period to another. The typical forest species are dominant in terms of specific diversity and population. The list of bird fauna includes 17 bird species that appear in Annex 1 to the Birds Directive. 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*.

**NEW OBSERVATIONS REGARDING
THE AQUATIC AVIFAUNA FROM ROSPA0010BISTREŢ
(SOUTH-WEST ROMANIA)**

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Keywords: aquatic avifauna, Pelecaniformes and Charadriiformes Orders, ROSPA0010Bistreţ.

In the present study, we render certain new aspects of the structure of the communities of aquatic birds belonging to the Orders Pelecaniformes and Charadriiformes, located within ROSPA0010Bistreţ in the Danube Floodplain (South-West of Romania), during the vernal and aestival seasons (May-July), in the last 7 years. We notice that the biotopes in the area of Bistreţ Lake are in continuous transformation, especially as a result of the abandonment of the fishing activities that took place here until 2006. This fact positively influences the composition and density of the aquatic avifauna. An important factor that triggered the changes in the spectrum of the aquatic avifauna of SPA Bistreţ is the climatic one. In recent years, as a consequence of the lower amounts of precipitations, we remarked a significant increase in the number of pelicans (e.g. *P. onocrotalus* with a maximum number of 500 of individuals, adults and immatures), whose feeding requirements are met by shallow or medium water level basins. The current ecological conditions have created trophic opportunities and have favoured the establishment of several colonial or solitary nesting species of the Order Pelecaniformes (*Botaurus stellaris*, *Ixobrychus minutus*, *Nycticorax nycticorax*, *Ardeola ralloides*, *Egretta garzetta*, *Ardea purpurea*, *Platalea leucorodia*, *Plegadis falcinellus*). The periodical fluctuations of the water level especially influences the dynamics of the species and populations belonging to the Order Charadriiformes. We mention several species belonging to the aforementioned order that have nested here for several successive years (*Himantopus*

himantopus, *Vanellus vanellus*, *Limosa limosa*, *Larus ridibundus*, *Chlidonias hybrida*) or after a long absence during the breeding season: *Glareola pratincola*, *Sterna albifrons*. Although they are species of faunal and conservative interest, also included in the EC Birds Directive, *Glareola pratincola* and *Sterna albifrons* are not included in the standard data form of Bistreț site, due to their absence during the period of documentation and registration of the lake in the Natura 2000 network, which requires special monitoring and protection of the colonies if they maintain within the protected area. Moreover, in the near future, the revision of the standard data form of the site have to be considered so that the new bird community may benefit from concrete conservation measures.

**FIRST RECORD OF AN ENTIRELY WHITE HARBOUR
PORPOISE (*Phocoena phocoena relicta* ABEL 1905)
IN ROMANIAN BLACK SEA WATERS AFTER 27 YEARS**

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Keywords: Black Sea, Romania, harbour porpoise, albino, anomalously white.

Cases of completely white animals are rare in nature and even more in case of cetaceans (whales, dolphins and porpoises). The most notorious white cetacean, real or imagined, was Moby Dick. When it comes to real facts, Migaloo, the albino humpback whale (*Megaptera novaeangliae*), was spotted yearly off the eastern coast of Australia in the early '90. There are several reasons or explanation for skin depigmentation such as albinism, piebaldism, vitiligo and poliosis. Albinism is widespread in the animal kingdom and is used to refer to a genetic disturbance. Genetic studies showed that albinism is caused by a mutation of a gene that regulates the production of melanin, the pigment protein in skin, hair and eyes. The gene inheritance is conditioned by its presence in both genitors. In 1993, an albino harbour porpoise was found stranded on the Eforie Sud beach. The present article brings another sighting, after 27 years, of an anomalously white harbour porpoise in Romanian Black Sea waters.

ECOLOGY
THE ENVIRONMENT PROTECTION

**MEDITERRANEAN WINTER 2019-2020
IN SOUTHWESTERN ROMANIA IN THE CONTEXT
OF CLIMATE CHANGES**

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Keywords: Mediterranean winter, monthly temperature averages, Hellmann criterion, warm winter phenomena, winter heat waves, vegetative processes.

After the hot and very dry autumn of 2019, which ended, from a pluviometric point of view, with a secondary rainfall maximum in November, the 2019-2020 winter was overall very warm with a general annual average of 2.91°C and a 3.86°C deviation compared to normal values. December 2019 was hot and very dry. January was hot, and, from a pluviometric point of view, it was excessively dry. February was warm as a whole and excessively dry, but the water supply in the soil remained almost optimal due to the rainfall in November. The climate variability of this winter was particularly high, and the warming continued although the solar activity was at a minimum and the El Niño climatic process was absent. At the level of Romania, the 2019-2020 winter was the second warmest winter in the history of climate records and so far, the first being 2006-2007, and the third 2015-2016, which is also valid for Oltenia. The paper is part of an extensive series of studies on climate variability in southwestern Romania and climate change at the regional level and is useful to all those interested in climate issues and its evolution in this part of Romania.

THE RECOVERY OF NOBLE METALS WITH MICROORGANISMS: BASIC AND APPLIED IMPORTANCE

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Keywords: microorganisms, noble metals, bacterial oxidation, enzymatic reduction, Romania.

The development of processes based on the activity of microorganisms is very important to increase the efficiency of processes for the recovery of noble metals from industrial waste by two beneficial effects: (1) the bioremediation of the environment polluted with inorganic waste, such as heavy metals that are toxic to most forms of life, including humans; (2) recovering the amounts of metal ions in order to reuse them for economic purposes. The evolution of technology, the deepening of knowledge on microbial diversity and the action of microorganisms on the different natural substrates allowed the performance of some economic technological processes. Among them, the use of microbiological methods for the recovery of noble metals from industrial wastes present a particular importance due to the depletion of rich ore stocks, as well as the accumulation of waste with a low metal content due to their processing by hydrometallurgical methods. The biodegradative action of microorganisms is the result of the alternative intervention by heterotrophic and chemo-lithotrophic bacteria in a positive sense in the economy of human society. Studies arising directly or indirectly from ecological research showed that both reduction and oxidation processes can be catalysed by microorganisms and indicated that, while these reactions can affect the oxidation of sulphide ores, they may have a potential for the bioremediation of industrial waste.

Through their activity, microorganisms cause changes in the pH of the environment, the redox potential, and during their metabolism they can develop various useful substances with complexation properties. In this context, microorganisms have a predominant role in the solubilization and recovery of noble metals from industrial waste.

**NOVEL RECORDS OF ENDOLITHIC MICROBIAL
COMMUNITIES IN THE PIATRA VERDE GYPSUM
RESOURCES OF SLĂNIC PRAHOVA**

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Keywords: endolithic microorganisms, Piatra Verde, Slănic Prahova.

Endolithic communities located inside of rocks represent a simple ecosystem whose composition is influenced by microclimate, which affects communities as a whole, with differences between trophic levels. It is well known that microorganisms provide fundamental ecosystem functions like biogeochemical cycling. The investigated site, namely the Piatra Verde gypsum geological reservation, is located between Slănic-Prahova and Teișani in the Prahova county, Romania. The first gypsum samples were taken during the middle of February 2020, and this study aimed to establish the presence or absence of microbial endolithic communities, either cryptoendolithic or chasmoendolithic. The method of reducing 2,3,5-triphenyl tetrazolium chloride (TTC) to triphenyl formazan (TF) as a measure of dehydrogenase activity was used for the determination of activity levels of bacteria on gypsum samples. The preliminary results revealed the presence of several types of microorganisms located either at the surface or inside the pores of the tested gypsum samples. Also, extracellular hydrolases of the isolated microorganisms were estimated.

**INSIGHTS INTO THE ATACAMA DESERT
MICROBIOLOGY: CULTIVATION OF HALOPHILIC
BACTERIA FROM SALT ROCKS
AND THEIR BIOTECHNOLOGICAL POTENTIALITIES**

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Keywords: halophiles, halophilic bacteria, hydrolases, halophilic enzymes, Atacama Desert.

Since many industrial processes are carried out under harsh physicochemical conditions, which would inactivate common enzymes from mesophilic organisms, current studies are geared toward the isolation of extremophilic microorganisms producing enzymes resistant to extreme salt concentrations, temperature and/or pH. Among extremophiles, halophiles constitute an important source of salt-tolerant enzymes that can be used in a wide variety of biotechnological applications. In this context, the aim of our research was to isolate and identify halophilic microorganisms producing hydrolytic enzymes from the Atacama Desert, one of the harshest environments on Earth. Isolates were recovered from halite samples and screened for the presence of seven hydrolytic activities (amylase, cellulase, inulinase, pectinase, gelatinase, caseinase and lipase) using agar plate-based assays. From a total of 23 halophilic bacterial isolates, most showed lipolytic (19 strains) and pectinolytic (11 strains) activities. Only two isolates were able to produce cellulase or caseinase and none of them synthesized the other tested enzymes. The molecular identification of eight selected isolates showed a strong similarity to members of the *Halomonas* and *Idiomarina* genera. Therefore, the results of the present study represent a preliminary, but essential step to identify novel biological sources of extremozymes in an environment once thought to be devoid of life.

***Ocimum basilicum* L. ANTIMICROBIAL POTENTIAL
CORRELATED WITH DEVELOPMENTAL STAGE
AND CULTIVAR TYPE**

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Keywords: *in vitro* *Ocimum basilicum* L. culture, callus differentiation *in vitro*, *in vitro* antibacterial activity, sweet basil cultivars, pharmacological properties of *Ocimum basilicum* L.

In this study, we considered the following criteria to assess the *Ocimum basilicum* L. (Labiatae) reactivity against the *Staphylococcus aureus* ATCC 25923 bacterial strain: the type of cultivar (Romanian, Italian and Greek basil), the developmental stage of the *in situ* plant material tested (plantlets, plant before flowering period, plant in flowering period), the callus formations differentiated *in vitro*, the interval of reactivity by considering two time marks, 4, respectively 24 hours. The samples were tested for antibacterial activity by determining the number of colony-forming units per millilitre (CFU/mL) in relation to the positive control; serial decimal dilutions were made from each sample. The results showed that both the time interval used to test the reactivity, the type of cultivar and the developmental stage influence the percentage of bacterial reduction. Comparing the data of different regarding the reduction of bacterial colonies, we appreciated that a good reactivity had callus formations obtained *in vitro*. Our obtained results underline the different characteristics of basil varieties in response to bacterial contamination, Italian basil plantlets expressing the best reactivity, followed by callus formations of Romanian basil, then Greek plant before the blooming period and Romanian plant in the blooming stage.

NUTRITIONAL PARTICULARITIES OF PATHOGENIC CONDITIONED MICROORGANISMS FROM THE MICROBIOTA OF THERAPEUTIC WATERS

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Keywords: microbiota, nutrition, water, biogen, therapeutic.

For their growth and multiplication, microorganisms need both major (C, O, H, N, S, P, K, Mg, Ca) and minor (Zn, Mn, Na, Cl, Cu, Ni) biogenic elements; they must find in the environment the source of C (energy) and a source of N, essential elements for the synthesis of specific molecules: proteins, nucleic acids. A microbiological analysis of 148 samples from 2017-2018 aimed at seeing whether different concentrations of nitrogen compounds in therapeutic waters, correlated with pH variation, can limit or stimulate the development of pathogenic conditioned microorganisms. The presence of total coliform bacteria in therapeutic waters was correlated with faecal coliforms but not with *Pseudomonas aeruginosa* or clostridiums. Intestinal enterococci were identified along with other microbiological indicators of faecal pollution (*Escherichia coli*, pseudomonadae, anaerobic bacteria), with the exception of total coliforms. Moreover, intestinal enterococci were identified in therapeutic waters regardless of their pH ($R = 0.0264$) but their numerical densities varied in direct proportion to their mineralization ($R = 0.248$) and also with the ammonium ion concentration ($R = 0.3662$).

THE PHYSICAL, CHEMICAL AND BIOLOGICAL STATUS OF WATER BODIES IN THE JIU RIVER CATCHMENT AREA

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Keywords: the Ișalnița reservoir, water chemistry, degree of eutrophication, biological state, Jiu.

Water is a renewable, vulnerable and limited natural resource at the global level, which is why it is treated as a natural heritage that must be protected and secured. In Romania, waters are part of the public domain of the state, and the “Romanian Waters” National Administration is a unique operator of water resources. The paper aims at assessing the physical, chemical and biological status of the water in the Ișalnița reservoir under the influence of human activities, as well as developing strategies for the rehabilitation and conservation of affected aquatic ecosystems, applicable to other similar hydro-systems. The water samples were taken from the reservoir dam on a monthly basis. Thus, the pH of the water was alkaline (7.7-8.1 pH units); the oxygen level (DO 7.4-12 mg/l), BOD₅ (2-4,7mg / l), COD Mn (4.2-9.3) and the conditions for nutrients determined the inclusion of the water in the 1st and 2nd category of quality, and the chlorophyll-*a* contents (44 g/l) reflect the degree of eutrophication. Their role is to highlight the functional diversity of the microbiota involved in the water biogeochemical cycles, and its pollution is a current problem, with more or less serious consequences on the population. The effects of water sources pollution are complex and varied, depending on the nature and concentration of contaminated substances (nutrients regime) which shows that in terms of saprobes, the Ișalnița reservoir is a eutrophic lake.

**THE USE OF MICROORGANISMS AND INVERTEBRATES
IN THE REMOVAL OF METALLIC IONS FROM
NATURAL SUBSTRATES: FUNDAMENTAL
AND APPLIED ASPECTS**

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Keywords: microorganisms, invertebrates, metallic ions, enzymatic reduction, Oltenia.

Biological factors have a major role in the transformation and mobilization of metal ions in soil, water and sediment. A variety of microorganisms and invertebrates are involved in these processes that have the ability to reduce metal ions under aerobic and / or anaerobic conditions. Through this activity of microorganisms and invertebrates, the reduction of metal ions is a process of bioremediation of environments polluted with metal ions, thus achieving their detoxification. Microorganisms and invertebrates that have the ability to reduce metal ions may be tolerant and / or sensitive to them and are present in water, sediment and soil contaminated with the metal ion. The bacterial solubilization of metal ions from waters and sediments is facilitated by metabolites excreted by microorganisms and invertebrates that are part of the microbial consortium encountered in leaching operations of sulphur ores. The literature describes several mechanisms involved in the adaptation, tolerance and resistance of microorganisms and invertebrates to polluting metals in Oltenia, as well as in its

surrounding areas. The extracellular precipitation, decreased uptake capacity, enzymatic reduction or microbial oxidations are some of the mentioned mechanisms of biological transformation of polluted metals into less toxic forms. It is generally stated that the tolerance of microorganisms and invertebrates to metal ions has probably evolved over time through their exposure under natural conditions to anthropogenic sources of metallic ions. Thus, waters and soils that are not contaminated with metal ions can host micro-organisms and invertebrates resistant to metal ions. Microorganisms and invertebrates resistant to high concentrations of metal ions have been isolated from such waters and soils. In contrast to bacteria, yeasts are more resistant to high concentrations of metal ions, because metallic ions present in high concentrations in the environment are toxic to microorganisms. Toxicity is seen in the alteration of the conformational structure of nucleic acids and proteins, the interference of metals in oxidative phosphorylation and the osmotic balance. Also, the studies highlighted the ability of microorganisms and invertebrates to adapt to the presence of toxic metals in the environment by developing resistance systems specific to each group of microorganisms and invertebrates isolated from environments polluted with metal ions from Oltenia. The populations of gastropods (*Viviparus acerosus*, *Radix balthica*, *Lymnaea stagnalis*) represent one of the reference factors regarding the accumulation of heavy metals such as Cu^{2+} and Cd^{2+} . Bioaccumulation is strongly dependent on the amount of metal present in the sediment habitat. Sweetwater snails may accumulate higher levels of Cu^{2+} and Cd^{2+} than the environmental concentrations (0.001-0.01 mg / l according to Ord. 161/2006), which are generally recognized as a “macroconcentrator” for these HMS species.

AN INTEGRATIVE STUDY ON THE STRUCTURE OF BIODIVERSITY FROM LACUSTRINE ECOSYSTEMS IN THE FLOODPLAIN OF THE DANUBE

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Keywords: biodiversity, lacustrine ecosystems, the Danube, the flooded area, Oltenia.

The flooded area of the Danube is one of the most important wetlands in Europe, which is characterized by complex, aquatic and terrestrial ecosystemic structures that play a major role in the regulation and balancing of climate processes (temperature variations, humidity, hydrological regime), ecological processes (by localization of a great biodiversity) and economic processes – the production of natural resources. The researches carried out on the floodplain of the Danube, in the Cetate - Dăbuleni sector, are part of a national programme for the knowledge of the biodiversity structure of specific ecosystems of wetlands from the southwestern of Romania. The physical and chemical characteristics of the water, the structure of the planktonic and benthic biocenoses were highlighted. The greatest diversity belongs to algae, the most abundant being cyanophyceae, bacillariophytes and chlorophylls. Marsh and aquatic macrophytes occupy an important place in the bioeconomy of ecosystems. One of the main ecological factors of the structure of the communities of organisms in the flood zone is the Danube, and the interdependence between them contributes to ensuring the structural-functional peculiarities of the biocenosis. The river waters that

periodically enter the lakes represent the main source of the biological production of the lake ecosystems, determining the development of the primary producers and consumers in correlation with its specific ecological particularities. The fauna specific to the floodplain of the Danube includes 24 groups of invertebrates, dominant being protozoa, rotifers, copepods, cladoceres, oligochaetes, gastropods, bivalves, amphipods, odonates, chironomids. Gastropods populations is important component of the biological production of eutrophic lake ecosystems and identified a total number of 37 species. The analyses performed by the mineralization process in the lacustrine ecosystems from the studied sector illustrate the capacity of the lung snail species such as *Radix balthica* and *Lymnaea stagnalis* to accumulate metal ions of Mn^{2+} , Fe^{2+} , Cu^{2+} and Zn^{2+} type in direct correlation with the chemical peculiarities of the soil in the flooded area of the Danube. Also, enzymological studies have shown that dehydrogenase, catalase and phosphatase are found in irrelevant amounts in the sediments of the Bistreț, Maglavit and Desa-Ciuperceni lakes in this sector.

THE PLANTS-SOIL INVERTEBRATES RELATIONSHIP – A BRIEF REVIEW

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Keywords: plants, soil invertebrates, relationship.

After their death, plants and animals become organic substances that reach the soil in substantial proportion. The relationships between plants and animals are complex, and soil invertebrates play an important role in soil fertility, nutrient turnover and other processes at the soil level. The decomposing organic matter from soil provides nutrients that are vital for plant growth. The decomposition and nutrient cycling by soil invertebrates are augmented both directly (affecting the structure and activity of microbial populations) and indirectly (excreting nutrients into the soil solution) and causing an increment in the pool of available nutrients for root up-take, thus benefiting the plants. Our paper focuses on some studies (68) published in international journals available online. In the future, the literature study will improve the existing knowledge because there are more publications that have to be analysed.

**THE INVESTIGATION OF THE BIOLOGICAL RESPONSE
DUE TO THE CULTIVATION
IN PROTECTED AREAS OF TOMATO PLANTS
ILLUMINATED WITH LED LIGHT, THROUGH
PHYSIOLOGICAL DETERMINATIONS AT LEAF LEVEL**

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Keywords: physiological determinations, tomatoes, LED lights.

The treatment method tested in the present experiments aimed at increasing the performance of physiological processes during the development of tomato plants from 3 Romanian varieties (Hera, Coralina and Sonia de Buzau), under the effect of high-power monochrome light emitted diodes (LEDs) (red, blue and white light). The observations focused on investigating the biological response due to the cultivation in protected areas of tomato plants additionally exposed for 30 minutes to LEDs, by physiological determinations for the leaves situated near the top of the main stem. The photosynthesis intensity, transpiration intensity, stomatal conductance, internal CO₂ concentration, as well as the amount of chlorophyll were determined in tomato seedlings, during the vegetative growth phase until the formation of the second inflorescence. The obtained results showed

that the physiological determined indicators values varied according to the cultivar, the age of plants and the monochromatic light treatment. A stimulating effect has been noticed especially in the case of blue light, regarding both the photosynthesis rate and the transpiration rate. Blue and white light increased the stomatal conductance compared to the control, while exposure to red light caused a statistically significant decrease of the values of this indicator. Prior to the treatments, the internal concentration of carbon dioxide did not vary according to the cultivar, but subsequently, values were significantly lower than the control (e.g. Hera cv.) in the case of LED light, while, usually, no significant differences were recorded between the varieties and the applied treatments. Total chlorophyll content increased for control variants with the advancing age of the seedlings, but the trend was not the same for monochromatic light treatments.

THE LONG TERM DYNAMICS OF URBAN GREEN SPACES IN ROMANIA

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Keywords: urban planning, spatial planning, green infrastructure, ecosystem services, urban sustainability, urban ecology.

Urban green spaces are important for their contribution to urban welfare, sustainability and resilience through the ecosystem services provided. However, in Romania, as in other developing countries, green spaces were neglected, and the planning policies aimed at protecting and expanding the green infrastructure were not enforced. As a consequence, this study aimed at looking at the long-term dynamic of Romanian urban green spaces using geospatial data. The results indicated that the green spaces were lost and fragmented, reclaiming immediate action on behalf of city managers and public authorities.

**POSTER PRESENTATIONS
VEGETAL BIOLOGY**

RESEARCH ON THE INFLUENCE OF IRRIGATION ON THE NUTRITIONAL QUALITY OF THE SWEET POTATO IN THE CONDITIONS OF THE SANDY SOILS IN THE SOUTH OF OLTENIA

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Keywords: sweet potato, irrigation, quality, total dry matter, sandy soils.

During 2018-2019, research was conducted on the sandy soils of southern Oltenia regarding the influence of irrigation water on sweet potato production and on the nutritional quality of tubers. The experiment took place on a sandy soil with a low to high supply of nitrogen, a high supply of phosphorus, a low supply of potassium, a low to medium supply of organic carbon, and a moderately acidic to neutral reaction. The best production results were obtained under the conditions of 2019, in the irrigated variants with watering norms of 145 m³/ha and 290 m³/ha, over a period of 100 days from plantation (30.18-31,75t / Ha). The increase of the watering norm, as well as of the irrigation period led to the decrease of the production of tubers. The biochemical composition of the tubers was influenced by the amount of water administered through irrigation. The best results were obtained in the variant irrigated with a watering norm of 290 m³/ha up to 100 days after plantation. The irrigation of the crop up to 110 days after plantation led to a decrease in the amount of total dry matter in the tubers. A correlation given by a polynomial equation of the second degree was established between the production of tubers and the amount of total dry matter in the tuber, with a significant distinct correlation factor $r = 0.73^{**}$. The quantity of total dry matter in the tubers decreases directly with the increase in the production of tubers. The accumulation of starch in the tubers was

influenced differently by the application of water through irrigation, during the two years of study. The starch tends to accumulate, with the increase of the applied water quantity, significantly under the conditions of 2018 and insignificantly in 2019.

**THE EFFECT OF CLIMATE CONDITIONS
ON THE GROWTH AND DEVELOPMENT OF PEANUTS
(*Arachis hypogaea*) GROWN ON SANDY SOILS FROM
SOUTHERN OLTENIA**

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Keywords: peanuts, sandy soils, genotype.

In the area of sandy soils in the south of Oltenia, the air temperature can vary during the vegetation period. The elements of productivity and the production of peanuts differ according to the variety and the conditions of growth and development. The elements of productivity are influenced by air temperature, and high air and soil temperature influence pod production negatively, too. Peanut varieties react differently depending on their tolerance to high temperatures. The cultivation of genotypes of peanuts that tolerate heat stress is becoming more and more important for high yields. Of the studied genotypes, the HYY1, HYY2, Provenance China 2, Henan Province genotypes proved to be tolerant to thermal stress and obtained the highest values for some elements of productivity and yields that exceeded 5000 kg / ha.

**THE DISTRIBUTION OF THE *FLEACK VIRUS*
IN NATURALLY INFECTED VINE**

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Keywords: virus, ELISA, vine.

Knowing the appropriate test sample is critical and defining the most appropriate organs, tissues and periods is of paramount importance for the safe use of the ELISA diagnostic method. Walter & Etienne (1987) studied the conditions for the detection of GFLV and ArMV by ELISA in grape tissues at different times of the year. According to the results, the leaves, roots and peeled wood (sawdust) are the best sources of virus. During the resting period, the use of wood allowed the detection of viruses even when the wood fragments were harvested and stored for several months at + 6 ° C. No significant differences were found between the top, middle and base leaves (Walter & Etienne, 1987). In other studies, the concentration of the virus was in most cases higher in the leaves from the tip of the shoot in calves infected with GFLV (Bovey et al., 1980), ArMV & RRV (Rüdel et al., 1983) or the chromate mosaic virus - GCMV (Lehoczky et al., 1984).

**INCREASING THE CHEMICAL PARAMETERS OF SOIL
AND PHYSIOLOGICAL CHARACTERISTICS OF THE
ROMECA 554j TOMATO VARIETY BY EXTRARADICULAR
TREATMENTS WITH THE INOCULUM OF
CYANOBACTERIA AND MICROALGAE**

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Keywords: tomato, sandy soil, cyanobacteria and microalgae.

The results obtained regarding the use of inoculations with cyanobacteria and microalgae for soil enrichment in nitrogen and organic carbon in tomato culture have highlighted values that could recommend this method to increase soil fertility. Both in the control variant, and in the technologically fertilized version, the nitrogen content, as well as the other chemical components in the soil decreased, and in the variant with the cyanobacteria and microalgae inoculum, the amount of nitrogen, organic carbon and soil pH remained at almost constant values. The production results showed, in comparison with the control variant, production increases both in the technologically fertilized variant (603.66 g) and in the variant with the cyanobacteria and microalgae inoculum (532 g).

The data on the quality of the fruit revealed that the fruits of the variant with the cyanobacteria and microalgae inoculum are sweeter, have a smaller amount of water, but also the acidity is lower, both compared to the control variant and to the chemically fertilized variant. The best bacterial detachment protocol for the following chemical treatment 0.5 % v/v Tween 20 + 3mM sodium pyrophosphate is 30 minutes of sonication.

ANIMAL BIOLOGY: INVERTEBRATES

**RESULTS OF HELMINTOLOGICAL ANALYSIS
OF THE COMPLEXES OF PHYTOPARASSED NEMATODES,
ASSOCIATED IN PEACH ORCHIDS IN THE REPUBLIC
OF MOLDOVA**

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Keywords: phytoparasite nematodes, biological control, species diversity, nepo-virus vectors, peach orchards.

According to the analyses of taxonomic results of samples collected from soil and young roots, 32 species of nematodes were detected in various newly created and productive peach orchards in the districts of the central and southeastern horticultural areas of the Republic of Moldova. Depending on the diversity and classification of parasitic and vector nematodes, the abundance in numerical density and the ecological-trophic spectrum in the investigated sectors, the ectoparasitic species associated with semi-endoparasitic species, as well as migratory endoparasitic species are predominant. Significant helminthotic diseases in the newly formed root system cause species of endoparasitic nematodes: *Pratylenchus penetrans*, *P. pratensis*, *P. subpenetrans* and *P. neglectus*, followed by endoparasitic migratory species of *Ditylenchus dipsacs*, accompanied by the spiral species *Rotylenchus agnetis*, *R. robustus* and the ectoparasite-vector species of nepo-viruses *Xiphinema brevicolle*, *X. index*, *X. diversicaudatum*, *X. viittenes*, *X. rivesi* and *Longidoms elongates*. These species are associated, expanded and established vertiginously on peach-planted trees and infect young roots, forming long-time specific populations, which frequently require helminthological plant monitoring and effective methods for the protection and management of plantations of peaches, as well as other horticultural orchids. Actually, in the sectors predestined to create new types of orchards in the peach industry, it is important to

use helminthological methods of soil registration in seasonal and annual dynamics, in order to detect the presence of complexes of parasitic nematodes and vectors of nepo-viruses, in primary and secondary infestations with several pathogenic viruses in young trees.

**IMPACT RESEARCH ON THE FERTILIZATION AND CROP
MANAGEMENT ON INVASIVE CYST-FORMING
NEMATODE COMPLEXES OF *Heterodera schachtii* SCHMIDT
SPECIES ON EXPERIMENTAL SUGAR BEET FIELDS IN THE
REPUBLIC OF MOLDOVA**

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Keywords: sugar beet, cyst nematodes, crop rotation, monoculture, fertilizations, abundance.

Phytosanitary investigations and helminthological analyses are expected to establish the parasitic impact on sugar beet culture on the invasive nematode complexes of the cyst-forming species *Heterodera schachtii* Schmidt, under the same environmental conditions as the influence of mixed fertilization management (organic + mineral), on experimentally mounted crop and monoculture soil variants (28 years). Comparative values were established in plants, researched variants, densities of the numerical population, the level of helminthotic disease with invasive larvae and cysts of the genus *Heterodera* spp., including other species of associated parasitic nematodes. On monoculture plots, the density of cyst nematodes was 25-90 and more and the level of root infection was 30-90%, exceeding the threshold of economic damage. Furthermore, endo-ectoparasitic species of genus *Pratylenchus*, *Paratylenchus*, *Tylenchus*, *Filenchus Helicotylenchus*, *Ditylenchus* were numerous, causing a loss in the quality of sugar beet crops. Crop rotations with grains and corn in combined fertilization effectively reduced the population of *H. schachtii* (5–15 cysts/1dm³) to below the damaging density threshold, and the level of disease decreased effectively by 10-20%. The obtained results allow the establishment of the efficiency of the technological management of cultivation and integrated protection for sugar beet through contributions to optimize the helminthic phytosanitary condition of the harmful species, with a serious impact on the harvest and quality of sweet roots.

THE PARASITOID HYMENOPTERA ASSOCIATED WITH DIFFERENT ANIMALS CORPSES IN ALGERIA

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Keywords: parasitoid Hymenoptera, animal corpses, yellow plates, Algeria.

This article presents the results of work carried out on three biological models: a laboratory rat *Rattus norvegicus* (Mammalia, Muridae) and the barbary partridge *Alectoris barbara* (Aves, Phasianidae) in 2016 during spring (March) in the Koléa region (Tipaza), and on a wild boar *Sus scrofa* (Mammalia, Suidae) in summer 2016 (July and August) around the Djurdjura National Park (Bouira). Only one trapping technique is used during this study: yellow plates placed around these three corpses. 561 Hymenoptera were captured in the laboratory rat, of which the Pteromalidae family comes second with 24.96% (140 individuals). Likewise, for the barbary partridge, 375 hymenoptera were found, with 22.67% (85 individuals) for the Pteromalidae family. 1595 hymenoptera were found in the wild boar, of which the Pteromalidae family also occupies the second position with 18.93% (302 individuals).

HAEMATOPHAGOUS PARASITES DETECTED ON FISH STOCKS FROM THE SMALL RESERVOIRS IN THE OLTENIA PLAIN (ROMANIA)

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Keywords: parasites, *Piscicola geometra*, *Argulus foliaceus*, fish.

Piscicola geometra and *Argulus foliaceus* are two haematophagous parasites collected through sporadic seasonal fishing carried out in the spring of 2009 and 2012, in the study area represented by ten reservoirs in the Preajba Valley from the Oltenia Plain. These parasites are the most common in these lakes and affect a wide range of host fish, both in natural and artificial pools. The *Piscicola geometra* parasite was identified only in *Carassius gibelio*. In the spring of 2009, we sampled 42 specimens of fish and the etiological agent was the crustacean *Argulus foliaceus*, which was reported only in two fish species: *Perca fluviatilis* and *Cyprinus carpio*. In 2012, 47 specimens of fish were captured, belonging to the species – *Scardinius erythrophthalmus*, *Lepomis gibbosus*, *Abramis brama*, *Carassius gibelio*, *Perca fluviatilis*. It has been found out that an important common factor causing these parasites is water temperature; consequently, the invasion decreases when water temperature increases. Although these parasitoses evolved subclinically without mortality, prevention and treatment measures were proposed to prevent their spreading. Thus, wood panels were installed in water so that the *Argulus foliaceus* parasite could lay its eggs and, as measures of combat, the literature recommends treatment with Trichlorfon at a dose of 1g/6m³ of water. The destruction of the macrophyte vegetation and prevention of the penetration of fish species from one basin to another, given that they communicate via spillways, are some prophylactic measures to prevent fish infestation.

**DIVERSITY OF PARASITIC FAUNA IN WILD BOARS
FROM THE “PĂDUREA DOMNEASCĂ” RESERVATION,
REPUBLIC OF MOLDOVA**

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Keywords: species of parasites, wild animals, boars.

The aim of the research was to study the parasitic fauna diversity in the wild boars from the natural reservation “Pădurea Domnească” of the Republic of Moldova. The wild boar (*Sus scrofa*) lives in band, in forests and nearby agricultural fields. The taxonomic composition of parasitic fauna includes various parasitic agents: 2 species of Trematoda (*Fasciola hepatica*) with extensity of invasion (EI) 18.4% and intensity of invasion (II) of 3.2 individuals, *Dicrocoelium lanceolatum* – 7.7% and II 3.1 individuals); the class Secernentea included 9 species (*Trichocephalus suis* – in 24.4% of cases, II – 3.4 individuals, *Strongyloides ransomi* identified in 82.2% cases, II – 10.4 individuals, *Metastrongylus elongatus* – in 52.4% cases, II – 6.6 individuals, *Oesophagostomum dentatum* – in 16.8% cases, II – 3.2 individuals, *Physocephalus sexalatus* – in 5.8% cases, II – 1.2 individuals, *Ascaris suum* – in 44.6% cases, II – 4.2 individuals, *Hyostrongylus rubidus* – in 22.6% cases, II – 3.0 individuals, *Gongylonema pulchrum* – 3.2% cases, II – 1.6 individuals, *Globocephalus urosubulatus* – in 42.2% cases, II – 4.6 individuals), the *Acantocephala* class was represented by one species (*Macracanthorhynchus hirudinaceus* – in 2.8% cases, II – 1.6 individuals) and the *Isospora* class was represented by 2 species (*Eimeria deblickei* – in 64.5% cases with II – 9.2 individuals and *Eimeria scabra* – in 32.6% cases with II – 4.6 individuals). Out of those 14 species identified in boars, two species (21.4%) are specific for boar only (*Gongylonema pulchrum*; *Eimeria deblickei*; *Eimeria scabra*), eight species (57.2%, *Trichocephalus suis*, *Strongyloides ransomi*, *Metastrongylus elongatus*, *Oesophagostomum dentatum*,

Physocephalus sexalatus, *Ascaris suum*, *Hyostromylus rubidus*, *Macracanthorhynchus hirudinaceus*) are common for other wild and domestic animals, and three species (21.4%) (*Fasciola hepatica*, *Dicrocoelium lanceolatum* and *Globocephalus urosubulatus*) are common for animals and humans.

**NEW SPECIES OF COLLEMBOLA (HEXAPODA)
FROM THE REPUBLIC OF MOLDOVA**

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Keywords: Collembola, new record, forest reserve, Republic of Moldova.

The paper includes new data about Collembola collected in the Republic of Moldova. Four species – *Proisotoma clavipila*, *Friesea claviseta*, *Desoria neglecta* and *Entomobrya superba* – are recorded for the first time. Of the revealed species, two are from Ivancea, one from Plaiul Fagului Reserve and one from the Codrii Reserve. The total list of Collembola species from the Republic of Moldova was expanded to 254.

**ODONATES FROM A FEW WADIS IN THE EL AOUNET
REGION, NORTH OF TEBESSA
(EXTREME EAST OF ALGERIA)**

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Keywords: Odonata, inventory, abundance, frequency, El Aouinet.

The odonatological fauna study was carried out at the Mellegue Oued and some of its tributaries during the period January - May of 2018. Seven families were identified, distributed over 13 genera and 18 species. The specific richness is greater and the population of Odonata is more balanced in the stations at Mesloul than in the stations at El Aouinet. Coenagrionidae and Libellulidae are the most abundant and frequent families at the two sites. Coenagrionidae are the most diverse in El Aouinet and Libellulidae in Mesloul. *Ischnura graellsii* is the most abundant species in El Aouinet, while *Orthetrum chrysostigma* and *Trithemis annulata* are abundant in Mesloul.

***Cucullia fraterna* Butler, 1878 (LEPIDOPTERA, NOCTUIDAE)
– A NEW SPECIES IN THE FAUNA OF THE REPUBLIC
OF MOLDOVA**

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Keywords: *Cucullia*, Noctuidae, Lepidoptera, Republic of Moldova, Orhei district.

The paper presents *Cucullia fraterna* Butler, 1878 (Lepidoptera, Noctuidae) – a new species in the fauna of the Republic of Moldova, collected in the “Cobîleni” natural reserve (Orhei district, Republic of Moldova). So, the number of *Cucullia* species identified on the territory of the Republic of Moldova reached 24.

**CONTRIBUTIONS TO KNOWLEDGE ON THE FAUNA
OF HAWK MOTHS (LEPIDOPTERA, SPHINGIDAE)
FROM THE REPUBLIC OF MOLDOVA**

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Keywords: Lepidoptera, Hawk moths, Republic of Moldova.

The paper summarizes data on the diversity and distribution of the Sphingidae family in the Republic of Moldova. The analysis of our research and literature data, materials from entomological collections in the Museum of Ethnography and Natural History and museum of the Institute of Zoology showed that the Sphingidae family is represented by 20 species, or 53 % of the European fauna. The Macroglossinae, Smerinthinae and Sphinginae subfamilies consist of 11, 4, and 5 species respectively. Hawk moths have been collected by authors from different parts of Republic of Moldova during 2012-2019. The species *Marumba quercus* (Denis & Schiffermüller, 1775), *Acherontia atropos* (Linnaeus, 1758), *Dolbina elegans* (A. Bang-Haas, 1912) and *Proserpinus proserpina* (Pallas, 1772) are endangered and require protection and conservation.

CHIRONOMIDAE OF THE CURSED MOUNTAINS (BJESHKËT E NEMUNA NATIONAL PARK) KOSOVO

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Keywords: chironomidae, Kosovo, Cursed Mountain, springs.

The Cursed Mountains are one of the last primeval mountain chains in Europe with pristine freshwaters including many springs and brooks. Their aquatic invertebrate communities are nearly unrecognized and still need extensive investigation. At the last CESAMIR (2018), we presented results of phenological studies of two springs. That research aimed at identifying the seasonal diversity patterns of insects and other aquatic invertebrates. It turned out that non-biting midges (Diptera, Chironomidae) are one of the most species-rich components of the spring benthos. That is why we conducted broad faunistic studies on 37 springs distributed exclusively in the Bjeshkët e Nemuna National Park. The studied springs reveal mostly neutral or slightly alkaline pH (6.18-9.45), low to moderate conductivity (80-636mS/cm⁻¹), dissolvent oxygen at a level of 3.2-9mg/l, and water temperature ranging from 9°C to 16°C. Investigated sites were distributed from upland (536 m a.s.l.) to high mountain altitudes (1700 m a.s.l.). The research revealed high species richness of Chironomidae in the western Cursed Mountains. Taxa from the Diamesinae, Chironominae, Orthocladinae, and Tanypodinae subfamilies are recoded. The species composition depends on physico-chemical conditions indicating usually very good water quality of rheocrenes in the Bjeshkët e Nemuna National Park. We support the extension of the protection of spring habitats outside the National Park to protect unique aquatic fauna also in lower elevated freshwaters.

ANIMAL BIOLOGY: VERTEBRATES

NEWTS AND FISH IN THE REMNANTS OF FORMER WETLANDS FROM THE NORTH-EASTERN ROMANIA IN FRONT OF THE SAME ENEMY

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Keywords: coexistence, small aquatic habitats, agriculture, endemic species, relict species.

The interaction between fish and amphibians is detrimental to amphibians. Both groups are present in the north-eastern Pannonian Plain, which was covered in the past by large wetlands. These wetlands were drained and reduced to canals and regularized watercourses in the last 150 years. In these last remnants of the former wetlands we identified two newt and 18 fish species (five non-natives) in the spring of 2015. Here, fish and newts use the same habitats; no negative relation was registered between their abundance. Fish and newts were present for a long time in this region; they survived together, and they are not excluding each other even under anthropogenic pressure. Fish are linked to small watercourses, which were mostly modified by humans in the past. Both newts and fish are affected by the proximity of the agricultural areas to the water, which negatively influences species richness. The intensive agriculture, its expansion to the water edge, and the massive use of pesticides threaten the survival of both groups. They managed to resist the desiccation of the wetlands, surviving tens of years in these small aquatic habitats, but they are unlikely to come through this last anthropogenic assault.

FEEDING IN COLD WEATHER: FOOD COMPOSITION OF A *Salamandra salamandra* (AMPHIBIA) POPULATION FROM THE IRON GATES NATURAL PARK, ROMANIA, IN EARLY MARCH

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Keywords: feeding, fire salamander, prey taxa, temperatures, cold weather, early spring.

The food composition of a *Salamandra salamandra* population from the Iron Gates Natural Park was studied on 22 individuals, using the stomach flushing method. The field work was done on 8 March 2020, on a cold rainy day. All *S. salamandra* individuals had stomach contents; they consumed 208 preys from 20 invertebrate taxa. In addition, they consumed inorganic elements, vegetal remains and shed skin fragments. The most important prey taxa were Gastropods and Diplopods. Despite the cold weather registered at the beginning of March, the feeding intensity of this population was higher in comparison with other studies made in Romania. Moreover, the prey taxa consumed in early spring are the same with those consumed in other periods by this species. The high feeding intensity indicates that *S. salamandra* is not affected by the low temperatures, having an optimal feeding even in the beginning of spring. Also, the increased feeding intensity indicates that the habitat has appropriate trophic resources and thus optimal conditions for *S. salamandra*.

CONSIDERATIONS REGARDING THE COMPARATIVE DYNAMICS OF THE AVIFAUNA IN TWO AQUATIC NATURAL PROTECTED AREAS FROM SOUTH-WESTERN ROMANIA

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Keywords: avifauna dynamics, aquatic protected areas, Oltenia Plain.

The study brings together the results of the ornithological observations made during the years 2017-2019 in two nature reserves of aquatic type, of national interest (IUCN category IV), located within the Oltenia Plain, south of the Craiova Municipality (south-west of Romania), namely: Preajba-Făcăi Lacustrine Complex and Lake Adunații de Geormane. In both areas, most bird species were observed during the prevernal and vernal seasons, and the fewest during the hiemal season. During all the ecological seasons, the number of observed species was higher in the area of Preajba - Făcăi Lacustrine Complex, as a greater variety and better quality of the habitats was found here. Although not predominant in number, aquatic species are representative for both protected areas, some of them representing the reason for designating these areas as nature reserves. Among the most frequent aquatic species present within both areas, we mention: *Cygnus olor*, *Anas platyrhynchos*, *Spatula querquedula*, *Aythya nyroca*, *Podiceps cristatus*, *Phalacrocorax carbo*, *Microcarbo pygmaeus*, *Ixobrychus minutes*, *Nycticorax nycticorax*, *Ardeola ralloides*, *Egretta garzetta*, *A. cinerea*, *Larus cachinnans*, *L. ridibundus*, *Chlidonias hybrida*, *Acrocephalus* sp. Among the identified species, there are some with an internationally unfavourable conservation status. Because both investigated areas are attractive for the local population, for various leisure activities, especially in the hot season, we propose the practice of ecological tourism, which allows the long-term conservation of bird species.

CONSIDERATIONS ON THE DENSITY, PREFERENCE OF HABITAT AND ETHOLOGY OF THE PYGMY OWL (*Glaucidium passerinum*) FROM THE FĂGĂRAȘ, IEZER-PĂPUȘA AND LEAOTA MOUNTAINS (SOUTHERN CARPATHIANS, ROMANIA)

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Keywords: Pigmy Owl, density, habitat, behaviour, protection.

The paper is a continuation of previously published results and brings new data regarding the density, preferences of habitat and ethology of the Pygmy Owl (*Glaucidium passerinum* Linnaeus, 1758) from the Făgăraș - Iezer-Păpușa - Leaota Mountains (România). It was found that the species is mainly present in the forests from the slopes oriented to NNW, SW and S with a 12-20° terrain gradient, as well as the fact that it prefers the vicinity to the small and open spaces, located in mature and relatively mature forests. For the researched area, the density can be assessed to 0.73 pairs/km², in the spruce forests, and to 0.61 pairs/km², in the spruce forests with logging, so that the population from the Făgăraș, Iezer-Păpușa and Leaota Mountains can be evaluated at maximum 450-650 pairs, of which maximum 350-500, in the Făgăraș Mountains. The birds showed a certain degree of tolerance to the forest exploitations on low level and, therefore, we think that the protection of the species can be achieved not only in the protected areas, but also in other categories of forests that are suitable for the species.

**IRON GATES NATURAL PARK
– A CHIROPTEROLOGICAL HOTSPOT
IN SOUTH-WESTERN ROMANIA**

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Keywords: Iron Gates, bat species, caves, Romania.

Investigations of over a decade in the karst of the Banat Mountains have revealed a significant abundance and diversity of chiropterological fauna in the Iron Gates Gorge, respectively in the Locvei and Almăj Mountains. Eight caves were investigated (Gura Ponicevei Cave, Veterani's C, Gaura cu Muscă C, Gaura Chindiei II C, Gaura Haiducească C, Padina lui Matei C, Ceuca C and Gaura lui Filip C), during the reproduction and swarming periods. 14 species of bats were indentified (*Rhinolophus hipposideros*, *R. ferrumequinum*, *R. euryale*, *R. mehelyi*, *R. blasii*, *Myotis myotis*, *M. oxygnathus*, *M. capaccinii*, *M. dasycneme*, *Nyctalus noctula*, *Eptesicus serotinus*, *Plecotus auritus*, *Barbastella barbastellus*, *Miniopterus schreibersii*) through direct observations, netting, sonograms, identification of skeletal remains and photograph-based counting. The Ponicevei and Gaura cu Muscă Caves are of special

importance. In the first cave, a maternity of about 5000 specimens of *R. euryale* were identified, fragmented into five clusters. The third cave has the largest maternity of *M. capaccinii* in Romania, up to 700 specimens. Of the 8 species of bats that were found in Gaura cu Muscă Cave, mention must also be made of the *M. schreibersii* maternity (about 400 specimens) and up to 60 specimens of *R. euryale*. *R. euryale* that also form stable clusters during the active period (up to 200 specimens) in the Padina lui Matei and Gaura Haiducească Caves. Comparing observations over several years with literature data, it was found that speleotourism causes very large numerical fluctuations from one year to another, especially in easily accessible caves, such as Gaura cu Muscă and Ponicovei. It is therefore considered that closing Gaura cu Muscă is necessary in order to protect the colonies of *M. capaccinii*, *M. schreibersii* and *R. euryale*. In addition another important bat shelter which is not in the Iron Gates Natural Park but very close by, in Mehedinți Mountain, Topolnița C. was visited. This one contain 1740 specimens of *R. euryale* in a maternity roost. Due to the importance of this colony it has been introduced in the present study.

**ECOLOGICAL AND EPIZOOTOLOGICAL FEATURES
OF SMALL MAMMALS (MAMMALIA: SORICOMORPHA,
RODENTIA) AS A RESERVOIR OF LEPTOSPIRA
IN THE REPUBLIC OF MOLDOVA**

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Keywords: small mammals, leptospirosis, pathogen agent, biotope, rodents.

During 2018-2019, in various types of ecosystems from the northern, central and southern areas of the Republic of Moldova, studies were been conducted on the ecological and epizootological features of small mammals and their role in leptospirosis foci. The small mammals were represented by 17 species. The euritope species *A. agrarius*, *A. flavicollis* and *A. sylvaticus* were the most abundant in all the studied ecosystems. Positive results for leptospira were determined in the Cahul district, the southern area, for 4% of the total number of investigated small mammals. The leptospirosis epizootic process involved the species *R. norvegicus*, where specific antibodies to the serotype *L. icterohaemorrhagiae* were determined. During 2018-2019, a total of 10 cases of leptospirosis were reported. A higher number of leptospirosis cases was reported mainly in the northern districts (8 cases) and in the central area (2 cases). At the country level, the highest share of leptospirosis cases was registered among rural population (90%). The research results confirm the existence of natural outbreaks of leptospirosis, the risk for public health being influenced by the varying degree of anthropization of ecosystems, which bring natural outbreaks closer to the settlements. The updated epizootiological data are used in the substantiation of public health policies, as well as in the propagation of measures argued for the population to prevent risks associated to diseases of zoonotic origin.

**THE DEMOGRAPHIC STRUCTURE OF *Microtus arvalis*
AND *Microtus rossiaemeridionalis* (MAMMALIA, RODENTIA,
CRICETIDAE) POPULATIONS IN AGROCENOSSES FROM
THE REPUBLIC OF MOLDOVA**

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Keywords: *Microtus*, colonies, density, sex structure, age structure.

The studies were carried out during 33 years (1986-2019) in various types of agricultural ecosystems and shelter belts all over the territory of the Republic of Moldova. The aim of the study was to elucidate the demographic structure of the populations of *Microtus arvalis* and *Microtus rossiaemeridionalis* in the agrocenoses of the Republic of Moldova. Standard methods were used to assess the number of small mammals, to determine their reproductive status and fecundity, and to estimate the number of colonies. During the study, we captured 1070 individuals of *Microtus arvalis* and 530 of *Microtus rossiaemeridionalis*. Significant differences were established between the species *M. arvalis* and *M. rossiaemeridionalis* regarding the number of adult and juvenile males, reproductive and juvenile females in both peak and depression phases, as well as between the density of the studies species in various types of agrocenoses: perennial herbs, cereal fields and shelter belts. The gender ratio in vole populations on cereal crops and perennial herbs at different densities depends on the populational phase. In young individuals, the dispersal is more intense, they mature faster, reproduce better and have higher survival rate in comparison with resident individuals of the same age.

**RODENT FAUNA (MAMMALIA, RODENTIA)
FROM THE TINCA AREA (BIHOR COUNTY, ROMANIA)**

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Keywords: rodent species, Tinca area.

The paper presents the results of the researches performed between 2000-2020 regarding the rodent species from the Tinca area (Bihor county, Romania) and some of their ecological and ethological aspects. 26 species were identified, belonging to 9 families and 20 genera.

THE BIOLOGICAL ROLE OF APOPTOSIS IN SPERMATOGENESIS: A REVIEW

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Keywords: apoptosis, spermatogenesis, biodiversity, spermatogenic system.

Apoptosis as a fundamental biological phenomenon is a special, genetically programmed form of physiological death of cell and is a prerequisite for the development and normal reproduction of living biodiversity, in particular the functioning of the reproductive system and the regulation of spermatogenesis. Apoptosis plays an important role in the regulation of spermatogenesis, a complex multi-stage process of sperm formation from primary germ cells, which begins during puberty and lasts throughout. The role of apoptosis in the regulation of spermatogenesis is well determined, since it controls the number of germ cells and eliminates defective gametes, but the role of apoptosis in ejaculate fertility impairment has not been elucidated yet. The biological role of apoptosis mechanisms in spermatogenesis is to maintain a constant number of cells in the spermatogenic system, to ensure the correct ratio of cells of various types and to remove genetically defective cells. Apoptotic changes in spermatozoa may result from the process initiated during spermatogenesis due to genetic disorders. So, a distortion of chromosome segregation, fixed at the verification points of the cell cycle, can lead to a switch to the apoptosis pathway. Thus, on the basis of the synthesis of information, it can be concluded that the biological role of apoptosis in the regulation of spermatogenesis is huge and inevitable for preserving biodiversity, however, to date, the patterns of sperm cell apoptosis realization and apoptosis markers initiation in the process have not been completely clarified. At the same time, it has been shown that the regulation of sperm cell apoptosis is directly dependent on the influence of various factors; in particular, it depends on the properties, concentration and time of exposure of the damaging agent to spermatogenesis.

ECOLOGY
THE ENVIRONMENT PROTECTION

THE CORROSION OF ZIRCONIUM ALLOYS INFLUENCED BY AEROBIC AND ANAEROBIC BACTERIA

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Keywords: isolation, bacteria, zirconium-tin alloy, biocorrosion.

Biocorrosion or microbiologically influenced corrosion is a significant concern for the petroleum industry. Aerobic and anaerobic bacteria have long been known to initiate, facilitate, or accelerate the corrosion processes of metals and their alloys. The present study aims at isolating some aerobic and anaerobic bacteria from a soil sample polluted with petroleum hydrocarbons and to establish whether they could colonize zirconium-tin alloy coupons. Two bacterial consortia containing aerobic heterotrophic bacteria (from the genus *Pseudomonas*, *Achromobacter*) and anaerobic sulphate-reducing bacteria (from the genus *Citrobacter*) were isolated from a soil sample polluted with petroleum hydrocarbons. The aerobic heterotrophic bacteria exhibited a higher ability to utilize different sole carbon sources, including polymers, sugars, amino acids, organic acids, amines, or amides, compared with anaerobic sulphate-reducing bacteria. The isolated bacterial consortia were able to form biofilms and to colonize the surface of zirconium-tin alloy coupons, although the colonization of coupons by aerobic heterotrophic bacteria and anaerobic sulphate-reducing bacteria alone was lower, compared with that observed when the coupon was immersed in a mixture of these bacterial consortia. Coupons immersed in the isolated bacterial consortia shown changes in the surface characteristics, such as the accumulation of corrosion products that can initiate, facilitate, or accelerate the corrosion processes of zirconium-tin alloy coupons. As expected, the accumulation of corrosion products on the zirconium-tin alloy coupons surface was less significant when they were immersed only

in aerobic heterotrophic bacteria or anaerobic sulphate-reducing bacteria, compared with that observed when the coupon was immersed in a mixture of these two bacterial consortia.

THE BIOREDUCTIVE SYNTHESIS OF PLATINUM NANOPARTICLES BY *Shewanella oneidensis* MR-1

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Keywords: biomineralization, nanoparticles, platinum, *Shewanella oneidensis* MR-1.

Currently, different biosynthetic methods that use either microorganisms or plant extracts are being developed as an alternative to the more polluting chemical synthesis procedures for obtaining nanomaterials. Special attention is paid to the biosynthesis of precious metal nanoparticles, in particular to platinum nanoparticles due to their multiple catalytic applications, such as degradation of organic dyes, redox reactions or electrocatalytic and catalytic conversions. In this work, we propose an environmentally friendly method for producing platinum nanoparticles using the metal ion-reducing *Shewanella oneidensis* MR-1. Resting cells of *S. oneidensis* MR-1 were used to reduce aqueous PtCl_6^{2-} ions and deposit them as metallic platinum nanoparticles on the surface of bacterial cells, at room temperature and at a neutral pH. Both lactate and succinate were used as electron donors. Different anaerobic techniques for the cultivation and manipulation of the bacterial cells were used instead of an anaerobic chamber, which seems to be a shortcoming for larger applications. Biosynthesized platinum nanoparticles were characterized by UV-Vis spectroscopy and fluorimetry techniques.

MICROBIAL FUEL CELLS AS DEVICES FOR ONLINE MONITORING OF *Shewanella oneidensis* GROWTH UNDER AEROBIC CONDITIONS

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Keywords: microbial fuel cells, bacterial redox potential, monitoring bacterial growth.

Microbial fuel cells are devices converting chemical or light energy directly into electric power through the catalytic activity of microorganisms. Following our previous work on the use of these microbial fuel cells to measure the redox potential of microorganisms, in this contribution we focus on the possibility to continuously monitor the growth of a bacterial by continuously measuring two electrical properties of a bio-electrochemical system in which bacteria are grown – first, the measuring of the redox potential in the anode bacteria filled compartment, and second, the current that these bacteria can send from this anode to the cathode through a resistor. Though this” electrical” method provides stronger results with electroactive bacteria, learning to understand the data from this kind of experiments can lead to new information about complex bacterial behaviour. In this article we calculate the correlation coefficient between the optical density of the bacterial culture and the electric signal (both the potential and the intensity of the generated current).

**THE INFLUENCE OF GAMMA IRRADIATION
ON THE GROWTH AND BIOCHEMICAL COMPOSITION
IN *Synechocystis* PCC 6803 AND *Chlorella sorokiniana*
UTEX 1230**

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Keywords: gamma radiation, *Synechocystis* PCC 6803, *Chlorella sorokiniana* UTEX 1230, generation time, lipids, polyhydroxybutyrate, total proteins, carotenoids.

The aim of this work was to characterize the response of cyanobacterium *Synechocystis* PCC 6803 and green microalgae *Chlorella sorokiniana* UTEX 1230 to 100 Gy gamma irradiation with respect to generation time and their content in valuable biochemical compounds. The ⁶⁰Co irradiation was carried out as previously described (Moiescu et al., 2019) but the biological material (both the cyanobacterium and the microalga) was prepared in a slightly different way. The experimental results showed that in 100 Gy gamma irradiated *Synechocystis* PCC 6803, there are differences with respect to the growth rate, total proteins, carotenes, polyhydroxybutyrate and chlorophyll *a*, as compared with the control cells. For *Chlorella sorokiniana* UTEX 1230 the experimental results showed that in 100 Gy gamma irradiated cells there are differences with respect to the growth rate, total proteins, carotenes, total lipids and chlorophylls (chlorophyll *a* and *b*). The results are discussed having in mind the potential biotechnological applications, as well as issues related to fundamental research.

**MICROBIAL CHARACTERISATION
OF SOME BACTERIAL ENDOPHYTES ISOLATED
FROM *Vicia faba* L. SEEDS**

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Keywords: microbial characterisation, endophyte bacteria.

In nature, plants colonisation with microorganisms is inevitable. Seed endophytes are the first interacting with young seedlings and may impact their growth. The internal colonization of plant tissues and endophyte vertical transmission denote a very good relationship between these two partners, perhaps a constricted interdependence sustained by environmental conditions, or a very good microbial adaptation to endophytic lifestyle in a certain host. However, endophytes are defined as asymptomatic internal colonisers, thus being classified as neutral, commensal or beneficial. If we subject them to various laboratory tests, we can determine their biologic attributes. If beneficial, endophytes can be used as inoculants. This study is focused on revealing new endophytic strains isolated form *Vicia faba* seeds, and their enzymatic activity. Although the endophytic seed community was limited, each strain revealed particular biologic traits with high potential attributes for plants protection and growth promotion.

**THE EFFECT OF THE ENTOMOPATHOGENIC FUNGUS
Metarhizium anisopliae ON THE EGGS OF THE DESERT
LOCUST *Schistocerca gregaria* (Forskål, 1775)**

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Keywords: *Metarhizium anisopliae*, *Schistocerca gregaria*, ootheca, biological control.

The desert locust potentially is the most dangerous for agriculture, because of the swarms' ability to fly rapidly across great distances. So far, the locust control strategy has mainly consisted of the application of synthetic insecticides, which can be harmful to the environment. Therefore Research Institutes are turning to other methods, including biological control, particularly microbiological control in its various forms, to try to control swarming locusts. Due to its persistence in the soil and its harmlessness to humans and animals and in the context of biological control, we tested an entomopathogenic fungus *M. anisopliae* on the eggs of the desert locust *S. gregaria*. Preliminary tests have been done in the laboratory on the locust ootheca. The cryptogam was administered by direct spraying on the treated eggs, and two doses were used, namely: $D_1 = 10^2$ spores / ml. and $D_2 = 8.6 \times 10^5$ spores / ml. At the same time, the witness was sprayed with sterilized distilled water. The results obtained showed that 40% of the eggs hatched at the low dose and only 24% at the high dose, therefore the hatching rate in the controls is higher.

THE DIVERSITY OF THE INVERTEBRATES FROM THE PRAHOVA RIVER VALLEY AND DOFTANA RIVER VALLEY. A REVIEW OF CURRENT KNOWLEDGE

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Keywords: shrublands, Doftana valley, Prahova valley, terrestrial invertebrates, specific diversity.

Complex ecological studies have been carried out along the Prahova and Doftana rivers. One of the important left-side tributaries of the Danube is the Prahova river, which, in turn, has the Doftana river as its left-side tributary. Both rivers (Prahova and Doftana) are accompanied from upstream to downstream by terrestrial ecosystems with a high importance in the structure and functioning of the regional landscapes. In this paper we will address issues related to the diversity of the terrestrial invertebrates from alluvial shrublands in the Doftana valley (Lunca Mare site) and Prahova valley (Nistorești and Cornu sites). We analyse the soil fauna (earthworms, enchytraeids, nematodes, springtails, mites), with a focus on Acari, where a species-level analysis was performed – Acari: Mesostigmata –, as well as the epigeous fauna (taxa superior to the species level) with a focus, at the species level, on Coleoptera: Carabidae. The species richness and Shannon-Wiener index of diversity are discussed, as well as the degree of specific similarity of invertebrates of and between the studied sites. The structural heterogeneity of the terrestrial invertebrate populations and the patterns of the seasonal dynamics of invertebrate diversity, and also the presence – during the studies – of the anthropic impact (exploitation or cutting the bushes by the population), additionally to existing climatic changes are added, impose the necessity to carry out further complex ecological studies to both update and develop the available information, by extending the studies on some cenotic elements that have not been approached previously (vertebrates).

**THE RELATIONSHIP BETWEEN THE INTENSITY
OF VEHICLE TRAFFIC AND THE ACCUMULATION
OF CHEMICAL ELEMENTS IN *Xanthoria parietina***

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Keywords: biomonitoring, lichens, metal accumulation, number of vehicles, atmospheric pollution, Romania.

Xanthoria parietina (L.) Th. Fr. (1860) was used to monitor the pollution with chemical elements caused by car traffic. In this study, in 8 counties in Romania, both the central and peripheral parts of *X. parietina* were used to indicate accumulation of chemical elements over time. The results indicated that the vehicle number was significantly correlated to Al, Zn, Cu, and Mn concentrations accumulated in the central parts of *X. parietina*. In addition, Zn and Fe accumulated in peripheral parts of *X. parietina* were also correlated with the number of vehicles. The two parts of *X. parietina* accumulate the chemical elements at different rates due to their ripeness degree. The central parts are old and accumulate high metal concentrations whilst the peripheral ones are young and accumulate low metal concentrations. In conclusion, the long time exposure of central parts is well defined through the accumulation of more metals, compared to the short-time exposure of peripheral parts characterized by the accumulation of two metals. Also, *X. parietina* could be used as monitor of metal pollution caused by car traffic.

**THE INFLUENCE OF THE CULTURE SUBSTRATE
COMPOSITION ON SOME BIOMETRIC
AND BIOCHEMICAL PARAMETERS OF TOMATO
SEEDLINGS - INIMĂ DE BOU**

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Keywords: substrate composition, biometric parameters, biochemical parameters, tomato seedlings.

The tomatoes are well known vegetables, grown and consumed worldwide due to their nutritional composition. The purpose of this research was to develop a technological flow for growing tomato seedlings under ecological conditions using nutritious substrates with natural fertilizers (peat, coffee grounds, eggshell and poultry manure). The biological material was represented by a traditional Romanian tomatoes seedling (*Inimă de Bou*) with indeterminate growth, very productive, recommended for early production. Some biometric and biochemical parameters such as: the plant height, the number of leaves per plant, the foliage weight, the foliage volume, the root length, the root weight, the root volume, and the content of free water, total water, bound water, dry matter and assimilatory pigments have been determined for five variants of *Inimă de Bou* tomatoes seedlings. Analysis of variance (ANOVA) revealed significant differences at some biometric and biochemical parameters among the *Inimă de Bou* tomato seedlings variants determined by the culture substrate composition.

PHYTOSOCIOLOGICAL CONSIDERATIONS REGARDING SILICEOUS SCREES FROM THE MERIDIONAL CARPATHIANS (ROMANIA)

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Keywords: plant associations, siliceous screes, Meridional Carpathians, Romania.

This paper presents a phytosociological study of the vegetation of siliceous screes from Meridional Carpathians that belong to *Androsacetalia alpinae* Br.-Bl. 1926 order. The purpose of this study was to characterize the plant associations from these stations and highlight their floristic similarities calculating the Relative Euclidean distance on the basis of the Ward method. Five plant associations were characterized and analysed, as follows: *Saxifrago carpathicae-Oxyrietum digynae* Pawl. et al. 1928, *Poo contractae-Oxyrietum digynae* Horv. et al. 1937, *Saxifrago bryoidis-Silenetum acaulis* Boșcaiu, Täuber et Coldea 1977, *Veronico baumgartenii-Saxifragetum bryoidis* Boșcaiu et al. 1977, *Festucetum picturatae* Krajina 1933 corr. Malinovsky et Kricsfalusy 2000. The hierarchical analysis confirmed the syntaxonomical affiliation to the *Androsacetalia alpinae* Br.-Bl. 1926 order by outlining distinct clusters.