The Museum of Oltenia Craiova
Natural Sciences Department

THE SCIENTIFIC INTERNATIONAL CONFERENCE

The Museum and Scientific Research

The 31st Edition

Book of Abstracts

VI

September 12th-14th, 2024

Craiova, Romania

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THE MUSEUM OF OLTENIA CRAIOVA
NATURAL SCIENCES DEPARTMENT

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SUMMARY

PROGRAMME

THE SCIENTIFIC INTERNATIONAL CONFERENCE

MUSEUM AND SCIENTIFIC RESEARCH

12th – 14th of September 2024

PROGRAMME

Thursday the 12th of September

THE MUSEUM OF OLTENIA CRAIOVA
Administrative office - Conference room
Welcoming the guests
$8^{00} – 9^{30}$

THE MUSEUM OF OLTENIA CRAIOVA
Administrative office - Conference room
The official opening
$10^{00} – 11^{00}$

PLENUM PRESENTATIONS
$11^{15} – 12^{30}$

Break
$13^{00} – 14^{45}$

NATURAL SCIENCES DEPARTMENT
Oral presentations
$15^{00} – 19^{00}$

Friday the 13th of September

$8^{00} – 19^{30}$: Research field trip

Iron Gates Natural Park

Saturday the 14th of September

NATURAL SCIENCE DEPARTMENT
Exhibition room no. 1 - ground floor

POSTER PRESENTATION
$9^{30} – 11^{30}$

DEBATES IN PLENUM
AND FINAL CONCLUSIONS
$11^{45} – 13^{00}$

Thursday the 12th of September

OFFICIAL OPENING
10^{00} – 11^{00}

THE MUSEUM OF OLTENIA CRAIOVA
Administrative office - Conference room

❖ **Opening speech:**

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

❖ **Inaugural speech:**

- **Dorin Cosmin VASILE –** President of Dolj County Council
- **Antonie SOLOMON –** Vicepresident of Dolj County Council
- **Sina Niculina COSMULESCU –** Dean of the Faculty of Horticulture of the University of Craiova
- **Liviu Aurel OLARU** – Dean of the Agronomy Faculty of the University of Craiova

THE MUSEUM OF OLTENIA CRAIOVA
Administrative office - Conference room

PLENUM PRESENTATIONS

11^{15} – 12^{30}

Chaired by GACHE Carmen, PhD. - "Alexandru Ioan Cuza" University of Iași, Romania

POPESCU Oana-Cătălina, TACHE Antonio-Valentin, PETRIŞOR Alexandru Ionuț

Completing the urban green infrastructure with green areas related to public facilities / Completarea infrastructurii verzi urbane cu zonele verzi aferente facilităților publice

MOGÎLDEA Vladimir, BEJAN Iurii, ȚUGULEA Andrian
Assessment of green and blue infrastructure in urban and rural ecosystems and the impact on ecosystem services / Evaluarea infrastructurii verzi și albastre din ecosistemele urbane și rurale și impactul acestora asupra serviciilor ecosistemice

WORKS ON SECTIONS

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Administrative office – Conference room

1st part: 15^{00} - 16^{50}

Chaired by CODREA Vlad, PhD. - "Babeș Bolyai" University, Cluj Napoca, Romania

STELEA Ion
Structural and lithological relics in the Getic Crystalline of the South Carpathians / Relicte structurale și litologice în Cristalinul Getic al Carpaților Meridionali

CULESCU Flori, GHENCIU Monica
Areal distribution of boulders in the gravels of the eastern Getic Piedmont / Repartiția areală a bolovanilor în pietrișurile din estul Piemontului Getic

GHENCIU Monica, STELEA Ion
Old geological maps regarding Muntenia (1889-1943) / Hărți geologice vechi privind Muntenia (1889-1943)

BORDEIANU Marian, CODREA Vlad A., NOVAC Mircea
New aspects on the Bihor 'Autochthonous' and related covering thrusting nappes, based on geothermal well data / Aspecte inedite

despre 'Autohtonul' de Bihor și pânzele de șariaj acoperitoare, pe baza datelor din sondele pentru ape geotermale

GRIGORE Dan

Aspidoceratidae (*Physodoceras, Benetticeras, Orthaspidoceras*) species from the upper Jurassic deposits of the Hăghimaș Mts. (East Carpathians – Romania) / Specii de Aspidoceratidae (*Physodoceras, Benetticeras, Orthaspidoceras*) din depozitele Jurasicului superior, din Munții Hăghimaș (Carpații Orientali - România)

GRĂDIANU Ionuț

Billfishes (Istiophoriformes: †Palaeorhynchidae) from the Oligocene of Piatra-Neamț (Romania) / „Pești spadă" (Istiophoriformes: †Palaeorhynchidae) din Oligocenul de la Piatra-Neamț (Romania)

CODREA Vlad A., SOLOMON Alexandru A., VENCZEL Márton, FĂRCAȘ Cristina

New medium-sized multituberculate mammals remains from the Hațeg Basin (Transilvania, Romania) / Noi resturi de mamifere multituberculate de mărime medie din bazinul Hațeg (Transilvania, România)

CODREA A. Vlad, DIACONU Florina

The pliocene mastodon *Anancus arvernensis* from Scorila (Mehedinți County, Romania) / Mastodontul *Anancus arvernensis* de la Scorila (Județul Mehedinți, România)

POPESCU Aurelian, VEREȘ Daniel, VASILE Ștefan, TORCĂRESCU Bogdan

A new discovery of *Mammuthus primigenius* (Blumenbach, 1799) in Dolj County (SW of Romania) / O nouă descoperire de *Mammuthus primigenius* (Blumenbach, 1799) în județul Dolj (România)

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Chaired by STELEA Ion, PhD. – Geological Institute of Romania, Bucharest, Romania

ASIMOPOLOS Laurențiu, ASIMOPOLOS Natalia-Silvia, TURANBOY Alparslan, ULKER Erkan, ASIMOPOLOS Adrian-Aristide

Optimizing the exploitation of ornamental rock quarries by analysing the 3d fracture network / Optimizarea exploatării carierelor de rocă ornamentală prin analiza rețelei de fracture

ASIMOPOLOS Natalia-Silvia, ASIMOPOLOS Laurențiu, ASIMOPOLOS Adrian-Aristide, DINU Luminița, BALEA Bogdan

Study on the strongest geomagnetic events in the current solar cycle / Studiu privind cele cele mai puternice evenimente geomagnetice din ciclul solar actual

NICULICI Eugen Laurențiu, DINU Luminița

Evaluation of geomagnetic activity based on DST indices and the number of sunspots, in the last 6 solar cycles / Evaluarea activității geomagnetice pe baza indicilor DST si a numărului de pete solare, in ultimele 6 cicluri solare

DINU Luminița, NICULICI Eugen Laurențiu, TATARU Adrian

Space - temporal analysis of large geomagnetic disturbance, case study for the storm of 24 march 2024 / Analiza spațio – temporală a perturbațiilor geomagnetice mari, studiu de caz pentru furtuna din 24 martie 2024

CRUŞOVEANU - RUSU Simona, POPA Mihai Emilian, GRIGORE Dan

The Brădet quarry in Anina, a proposal for a new site of special scientific interest / Tithonianul din cariera Brădet (Anina) – propunere pentru o nouă rezervaţie paleontologică

MACOVEI Monica, RUSU Simona, SĂSĂRAN Liana

Geoheritage – Geosites and museum collections: the fossil site from Globu Craiovei / Geoheritage – Geosituri și Colecții muzeale: locul fosilifer de la Globu Craiovei

PRICĂ Rodica Galina

Geosites - perspectives, trends, education and challenges / Geositurile - perspective, tendințe, educație și provocări

PRICĂ Rodica Galina

Determination of the amount of geothermal energy potentially extractable from geological formations / Determinarea cantității de energie geotermică posibil de extras din formațiunile geologice

ROGOJANU Dumitru-Cătălin

Franz Nopcsa: a complex and controversial personality / Franz Nopcsa: o personalitate complexă și controversată

SECTION II – VEGETAL BIOLOGY
The Natural Sciences Department
Conference room 2nd floor

$15^{00} – 16^{50}$

Chaired by RĂDUȚOIU Daniel, PhD. - University of Craiova, Faculty of Horticulture, Biology Department, Romania
ȚÎȚEI Victor, PhD. - "Alexandru Ciubotaru" National Botanical Garden (Institute), Chișinău, Republic of Moldova

ȚÎȚEI Victor, COȘMAN Sergiu, COȘMAN Valentina

The evaluation of the biomass quality of *Astragalus cicer* and *Astragalus galegiformis* and prospects of its use in Moldova / Evaluarea calității biomasei de *Astragalus cicer* și *Astragalus galegiformis* L. și perspective de valorificare în Moldova

ȚÎȚEI Victor

The biochemical composition and nutritive value of green mass and silage from safflower *Carthamus tinctorius* L. / Compoziția biochimică și valoarea nutritivă a masei verzi și a silozului din plantele de șofrănel *Carthamus tinctorius* L.

IVANOVA Raisa, BRINDZA Jan

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ELISOVEȚCAIA Dina, IVANOVA Raisa, BRINDZA Jan

Determination of the morphometric parameters and reproductive ability of beech seeds (*Fagus sylvatica*) of Slovak origin / Determinarea parametrilor morfometrici și a capacității de reproducere a semințelor de fag (*Fagus sylvatica*) de origine din Slovacia

MIHNEA Nadejda, LUPAȘCU Galina, RUSU Vadim

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PETRUȘ-VANCEA Adriana, KLESZKEN Timea, SUCEA Felicia-Nicoleta

Preliminary data on the flora of Three Valleys of the Jiu Gorge National Park, Romania / Studiu privind flora în Parcul Național Defileul Jiului, România

RĂDUȚOIU Daniel

Ranunculus binatus Kit. ex Rchb. (Ranunculaceae) from Oltenia, Romania / *Ranunculus binatus* Kit. ex Rchb. (Ranunculaceae) din Oltenia, România

SECTION III – ANIMAL BIOLOGY – INVERTEBRATES
The Natural Sciences Department
Exhibition room – 2nd floor

1st part: 15^{00} - 16^{50}

Chaired by BACAL Svetlana, PhD. Hab. - Institute of Zoology, State University of Moldova, Moldova
PETRESCU Iorgu, PhD. - "Grigore Antipa" National Museum of Natural History, Bucharest, Romania

PETRESCU Ana-Maria, PETRESCU Angela, ANDREI Gabriela

Marine and terrestrial molluscs from Bermuda - A new collection from the patrimony of the ”Grigore Antipa” Museum from Bucharest (Romania) / Moluște marine și terestre din Bermuda - o nouă colecție din patrimoniul Muzeului ”Grigore Antipa” din București (România)

PETRESCU Ana-Maria, PETRESCU Iorgu

On type specimens of Caverniculous Isopods described by the famous romanian scientist Emil Racoviță in the collections of the “Grigore Antipa” National Museum of Natural History from Bucharest (Romania) / Despre exemplarele tip de izopode cavernicole, descrise de faimosul cercetător român Emil Racoviță, din colecțiile Muzeului Național de Istorie Naturală “Grigore Antipa” din București (România)

CREȚU Irina, BURDUJA Daniela, BUȘMACHIU Galina

Ladybirds (Insecta: Coccinellidae) from the Museum of Entomology, Institute of Zoology, Republic of Moldova / Diversitatea buburuzelor (Insecta: Coccinellidae) din colecția Muzeului de Entomologie al Institutului de Zoologie, USM

BUȘMACHIU Galina, CREȚU Irina, BACAL Svetlana, BURDUJA Daniela

New data on insecta from old Orhei, Republic of Moldova / Date noi despre insectele din Orheiul Vechi, Republica Moldova

STANCĂ-MOISE Cristina

Invasive insect species reported in the city of Sibiu, under the climatic conditions of 2021-2024 / Specie de insectă invazivă semnalată în orașul Sibiu, în condițiile climatice din 2021-2024

STANCĂ-MOISE Cristina

The study of insects in an agricultural ecosystem, a vegetable garden in the Orlesti Village of Valcea County / Studiul insectelor realizat în grădina de legume din comuna Orlești, județul Vâlcea

LILA GIMA

Coleoptera species (Insecta: Coleoptera) found in the Desnătuiului meadow, Giurgița village, Giurgița commune, Dolj county,

Romania / Specii de coleoptere (Insecta: Coleoptera) întâlnite în Lunca Desnățuiului, sat Giurgița, comuna Giurgița, județul Dolj, România

SECTION III – ANIMAL BIOLOGY – VERTEBRATES
The Natural Sciences Department
Exhibition room – 2nd floor

2nd part: 17^{20} – 19^{00}

Chaired by GACHE Carmen, PhD. - "Alexandru Ioan Cuza" University of Iasi, Romania
PETRESCU Angela, PhD. - "Grigore Antipa" National Museum of Natural History, Bucharest, Romania

VRABIE Valeria, BOGDAN Victoria, CIOCHINĂ Valentina
The comparative analysis of some representative bacteria of bird gut microbiota in urban and rural areas / Analiza comparativă a unor bacterii reprezentative ale microbiotei intestinale ale păsărilor din zonele urbane și rurale

GACHE Carmen, IGNAT Alina Elena
Bird fauna and the conservation status of some reservoirs in the middle basin of the Bârlad River (Romania) / Ornitofauna și statutul de conservare al unor lacuri de acumulare din bazinul mijlociu al râului Bârlad (România)

MESTECĂNEANU Adrian
The waterbirds of the Oești, Cerbureni and Curtea de Argeș dam basins (Argeș County, Romania) observed during 2023 / Păsările de apă ale lacurilor de acumulare Oești, Cerbureni și Curtea de Argeș (județul Argeș, România) observate în anul 2023

PETRESCU Angela, PETRESCU Ana-Maria, MATEI Petre Bogdan
A Catalogue of the collection of Tarsometatarsi (Aves) from the heritage of the "Grigore Antipa" National Museum of Natural History, Bucharest, Romania / Catalogul colecției de tarsometatarsuri (Aves) din patrimoniul Muzeului Național de Istorie Naturală "Grigore Antipa" București, România

SECTION IV – ECOLOGY- ENVIRONMENT PROTECTION
The Natural Sciences Department
Conference room 2nd floor

1st part: 15^{00} – 16^{50}

Chaired by GAVRILESCU Elena, PhD. - University of Craiova, Faculty of Horticulture, Biology and Environmental Engineering Department
PETRIŞOR Alexandru-Ionuţ, PhD. - "Ion Mincu" University of Architecture and Urbanism, Bucharest, Romania

MARINICĂ Andreea Floriana, MARINICĂ Ion, CHIMIŞLIU Cornelia, DIACONU Luminița

The warm winter of 2023-2024 in Southwest Romania – a climatic record / Iarna caldă 2023-2024 în sud-vestul României – record climatic

RUGINESCU Robert, BATRÎNESCU-MOTEAU Costin, NEAGU Simona, LUCACI Anca Ioana, COJOC Roxana, PODOSU (VLAD) Aurelia, ENACHE Mădălin

New bioplastic materials with biologically active properties under simulated commercial usage conditions / Materiale bioplastice noi biologic active în condiţii simulate de utilizare comercială

MARIAN Sanda Adina, DUDĂU Daniela Liana, CIOBOIU Olivia, CORICI Sorin, COTĂRAN Vasile, ȘCHIOPU Cristina, CHIMEREL Mircea, STOICA Ioan-Oană

Assessment of the ecological status/ecological potential for designated water bodies on the Jiu River according to the water framework directive / Evaluarea stării ecologice/potențialului ecologic pentru corpurile de apă desemnate pe râul Jiu în contextul Directivei Cadru pentru Apă

DUDĂU Daniela Liana, MARIAN Sanda Adina, CIOBOIU Olivia, CORICI Sorin, COTĂRAN Vasile, ȘCHIOPU Cristina, CHIMEREL Mircea, STOICA Ioan-Oană

The impact of hydro-technical works on aquatic ecosystems. Study case: The Jiu River from the springs to the Danube confluence / Impactul lucrărilor hidrotehnice asupra ecosistemelor acvatice. Studiu de caz: râul Jiu izvor-confluență Dunăre

CIOBOIU Olivia, DUDĂU Daniela Liana, MARIAN Sanda Adina, SIMULESCU Daniel

Hydrobiological particularities of the area of national interest of Balta Cilieni, Bailesti from the Oltenia Plain / Particularități hidrobiologice ale ariei de interes național Balta Cilieni, Băilești din Câmpia Olteniei

SURUGIU Victor

The biology and ecology of the mudsnail *Ecrobia maritima* (Gastropoda: Littorinimorpha: Hydrobiidae) at the romanian Black Sea coast / Biologia și ecologia melcului *Ecrobia maritima* (Gastropoda: Littorinimorpha: Hydrobiidae) de la coasta românească a Mării Negre

CHIRIAC (MIHAI) Luiza-Silvia, CIOBOIU Olivia, MURARIU T. Dumitru

The complexity of the rhizosphere - The "unseen" part of the soil – A short review / Complexitatea rizosferei – partea „nevăzută" a solului – o scurtă revizie de literature

ILIE Aurelian Leonardo, CIOBOIU Olivia, ILIE Lorena Cosma

Spiders in the cold season 2023-2024 from the North-Western part of Romania (Tinca Area, Bihor County) / Păianjenii în sezonul rece 2023-2024 din partea nord-vestică a României (zona Tinca, județul Bihor)

2nd part: 17^{20} – 19^{00}

Chaired by GAVRILESCU Elena, PhD. - University of Craiova, Faculty of Horticulture, Biology and Environmental Engineering Department
ENACHE Mădălin, PhD. - Institute of Biology Bucharest of the Romanian Academy

STÎNGACI Aurelia, SCERBACOVA Tatiana, SAMOILOVA Anna

A study of the complex effectiveness of biological agents in apple orchards in terms of climate change in the Republic of Moldova / Studiul eficacității complexe a agenților biologici din livada de meri la schimbările climatice în Republica Moldova

VOICU Diana, CIOBOIU Olivia

Improvement of *in vitro* development of *Mentha piperita* L. and *Mentha longifolia* (L.) Huds. Varieties / Optimizarea dezvoltării *in vitro* la varietățile *Mentha piperita* L. și *Mentha longifolia* (L.) Huds.

VOICU Diana, MITOI Monica, HOLOBIUC Irina, BANCIU Cristian, VLADIMIRESCU Mihnea, CIOBOIU Olivia, HELEPCIUC Florența

In vitro induction and multiplication of callus cultures producing secondary metabolites in *Pimpinella anisum* species / Inducerea *in vitro* și multiplicarea culturilor de calus producătoare de metaboliți secundari la specia *Pimpinella anisum*

ONETE Marilena, NICOARĂ Roxana Georgiana, MIHAI Luiza-Silvia, CIOBOIU Olivia, MANU Minodora

Biological and ecological attributes of plant species present in the pastures of some mountains in the South-West of the Fagaras Mountains / Însușiri biologice și ecologice ale speciilor de plante prezente în pășunile unor munți din sud-vestul masivului Făgăraș

ILIE Aurelian Leonardo, CIOBOIU Olivia, ILIE Lorena Cosma

Phenological anomalies regarding the flowering of spontaneous, subspontaneous and cultivated plants in the Bihor County (Romania) during April 1, 2023 - August 1, 2024 / Anomalii fenologice privind înfloritul la plantele spontane, subspontane și cultivate din județul Bihor (România) în perioada 1 aprilie 2023-1 august 2024

NICULESCU George, ROGOJANU Dumitru-Cătălin

Green solutions for sustainable cities / Soluții verzi pentru orașe sustenabile

SECTION V – POSTERS
Natural Science Department
Exhibition room no. 1 - ground floor

9^{30} – 11^{30}

BOIU-SICUIA Oana-Alina, PARASCHIV Alina-Nicoleta

The influence of pesticides and biopesticides on sweet potato fusarium mold / Influența unor pesticide și biopesticide asupra putregaiului responsabil pentru fuzarioza cartofului dulce

DERJANSCHI Valeriu

The heteroptera's species (Hemiptera, Heteroptera) preserved in the entomological collection in the Museum of Institute of Zoology, State University of Moldova / Speciile de heteroptere (Hemiptera, Heteroptera) conservate în colecția entomologică din Muzeul Institutului de Zoologie, Universitatea de Stat din Moldova

ȚUGULEA Cristina

Contributions to the knowledge of diurnal butterflies (Lepidoptera: Papilionoidea) from Orhei National Park / Contribuții la cunoașterea fluturilor diurni (Lepidoptera: Papilionoidea) din Parcul Național Orhei

TÎMBURESCU Constanța, BORONTEA Ioana Cornelia, GOGA Ionelia Claudia

Studies on the morphological and microscopic appearance of the hydatid cyst (*Echinococcus granulosus*), the larval stage of the *Taenia echinococcus* cestode in cattle and pigs in Dolj County / Studii privind aspectul morfologic și microscopic al chistului hidatic (*Echinococcus granulosus*), stadiul larvar al cestodului *Taenia echinococcus* la bovine și porcine în județul Dolj

RIDICHE Mirela Sabina

Results regarding the classification of the museum items from the ornithological collection of the Oltenia Museum (Romania) / Rezultate privind clasarea bunurilor muzeale din colecția ornitologică a Muzeului Olteniei (România)

DUMITRACHE Cristina Alina, PURCĂREA Cristina

A brief review of methods of collecting and examining water bird nests / O scurtă analiză a metodelor de culegere și examinare a cuiburilor de păsări de apă

STANCU Daniela Ileana

The flora and vegetation of the Capra Glacier Cirque of the Făgăraș Massif / Flora și vegetația circului glaciar Capra, Masivul Făgăraș

DRĂGULEASA Ionuț-Adrian, CURCAN Gheorghe, MAZILU Mirela, CIOBOIU Olivia, MARINESCU Ioan Eustațiu

The evolution of urban green spaces (UGS) case study: South-West Oltenia Region / Evoluția spațiilor verzi urbane (UGS-uri). Studiu de caz: Regiunea Sud-Vest Oltenia

Saturday the 14th of September

09^{30} – 11^{30}
POSTER PRESENTATIONS

11^{45} – 13^{00}
DEBATES IN PLENUM AND FINAL CONCLUSIONS

PLENUM PRESENTATIONS

COMPLETING THE URBAN GREEN INFRASTRUCTURE WITH GREEN AREAS RELATED TO PUBLIC FACILITIES

POPESCU Oana-Cătălina[1,2], TACHE Antonio-Valentin[1,2], PETRIȘOR Alexandru-Ionuț[1,2,3,4]

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Keywords: urban green infrastructure, cemeteries, ecosystem services, ecological connectivity, biodiversity.

The article analyses the contribution of urban public green spaces – gardens, parks, cemeteries – in biodiversity conservation, achieving ecological connectivity and the provision of important ecosystem services. The research focused on a specific component of green infrastructure, namely the green space in urban public cemeteries, which can bring and preserve biodiversity in urban areas. They can contribute to ecological networks in urban regions by achieving connectivity of habitats and can thus be included in the green belts of cities.

ASSESSMENT OF GREEN AND BLUE INFRASTRUCTURE IN URBAN AND RURAL ECOSYSTEMS AND THE IMPACT ON ECOSYSTEM SERVICES

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Keywords: ecological infrastructure, urban ecosystems, ecosystem services.

Green infrastructure is a key element of a sustainable urban ecosystem. It is recognized as an effective approach based on the way nature works, being an important source of ecosystem services provided to the population. Green and blue solutions are one of the new tools that can help cities increase their resilience and sustainability. The green infrastructure (forest plantations, forest-parks, agricultural land, hedges, lineaments, etc.), the blue infrastructure (lands under marshy waters, rivers, ponds) was evaluated and compared with the grey infrastructure (roads, streets and squares, constructions) in cities and rural areas in the development regions of the Republic of Moldova. The results show that the spatial share of green infrastructure in cities with a population greater than 30 thousand inhabitants (Chișinău city, Bălți city, Cahul city) represents about 25-35% of the total area, the share of grey infrastructure is 50-60 %, and the blue one only 2-4%. In smaller cities, the share of green infrastructure can reach values of up to 50-70 percent, and in rural areas, the share of green infrastructure reaches around 70-90%, blue infrastructure 2-3%, and the built one 10-12%. Cultural ecosystem services related to different types of ecosystems were identified in terms of supply, regulation and support. The dependence of the amount of ecosystem services (air purification, carbon storage, leakage retention) on the weight of the ecological infrastructure in the investigated ecosystems was investigated.

ORAL PRESENTATIONS
GEOLOGY

STRUCTURAL AND LITHOLOGICAL RELICS IN THE GETIC CRYSTALLINE OF THE SOUTH CARPATHIANS

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Keywords: Getic Crystalline, relict structures, granulites, hornfelses.

The metamorphic history of the Getic Crystalline in the Central South Carpathians (Sebeș-Cibin Massif) is related to two medium-grade regional metamorphism events, the first syn-collisional, M1 (Cadomian), and the second synchronous with the post-collisional uplift, M2 (Hercynian) The structure of the metamorphic pile is tabular and subhorizontal, consistent with the S2 flattening foliation, resulting from the vertical compressive stress associated with the post-collisional uplift. In the Eastern South Carpathians (Făgăraș Massif) the metamorphic pile is partially affected by Alpine retromorphism (M3) and partially restructured according to the associated axial plane foliation (S3). In this regional framework, relict structures and lithologies (pre-M1) locally occur, suggesting the existence of a pre-collisional metamorphic episode M0 (Precambrian).

AREAL DISTRIBUTION OF BOULDERS IN THE GRAVELS OF THE EASTERN GETIC PIEDMONT

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Keywords: Cândești Piedmont, Cotmeana Piedmont, boulders.

The Getic Piedmont east of the Olt River includes two units, the Cândești Piedmont and the Cotmeana Piedmont. The source area of the gravels in the Cândești Piedmont is Carpathian, while the source area of the gravels in the Cotmeana Piedmont is much wider, Carpathian and Intracarpathian. In the Cândești Piedmont, large pebbles (boulders) appear only in the north of the piedmont, close to the source area. In the Cotmeana Piedmont, the boulders appear in the north-east of the piedmont but also on its western margin, on the left bank of the Olt River, a river with high transport power that carries detrital material from both the Carpathian and Intracarpathian areas.

OLD GEOLOGICAL MAPS REGARDING MUNTENIA (1889-1943)

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Keywords: geological maps, Muntenia, Prahova.

This work performs an inventory of the old geological maps regarding Muntenia. In total, 28 maps are listed in chronological order, of which 3 are official maps (very rare maps) carried out within the mapping programs run by geological institutions of the Romanian state, and 25 are author's maps, 5 of these being annexes to doctoral theses. The author maps also include the publications in which they were published, so that the bibliography consulted on this occasion is included in the text. Most maps (15) refer to Prahova, a region rich in mineral resources, oil, coal and salt.

NEW ASPECTS ON THE BIHOR 'AUTOCHTHONOUS' AND RELATED COVERING THRUSTING NAPPES, BASED ON GEOTHERMAL WELL DATA

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Keywords: Bihor 'Autochthonous', Pannonian Basin, western Neogene sub-basins, geothermal waters, tectonics, Romania.

The Bihor "Autochthonous" along with the overlying thrust nappes, tectonic blocks uplifted as horsts, or sunken as grabens, and the numerous fractures and faults complicating the compartmentalization into tectonic blocks of the nappe system, combined with the relationships with the Neogene sedimentary fill of the Pannonian Basin and the primarily Middle Miocene sub-basins, have formed the premise that conditioned the subsequent formation of the landscape observable today in N-W Romania. Due to the diversity of tectonic events and because the lithosphere is thinned in the area of the 'Autochthonous' associated with the Pannonian region, it has acquired a peculiarity that allows the circulation of groundwater through faults, fractures, and fissures, structured within complex hydro-geothermal systems. Due to the presence of geothermal fluids within the 'Autochthonous', in the last 60 years, several geothermal boreholes have been drilled, revealing new data on its geological evolution. The result of these drilling data has been the persistence of question marks, difficult to explain. Such aspects

can be found, for example, in the Băile Felix or Cotiglet areas, where, unlike the surrounding regions, geothermal waters do not provide flow rates and temperatures motivating for extraction. These are exemplified even though the tectonics appear ideal for the existence of hydro-geothermal systems. Alongside these, other case studies will be presented, proving that we are still far from knowing and understanding its structure in all details and, implicitly, its geothermal potential.

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ASPIDOCERATIDAE (*Physodoceras, Benetticeras, Orthaspidoceras*) SPECIES FROM THE UPPER JURASSIC DEPOSITS OF THE HĂGHIMAŞ MTS. (EAST CARPATHIANS – ROMANIA)

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Keywords: Physodoceras, Benetticeras, Orthaspidoceras, paleontology, Hăghimaș.

The paper presents ten species/subspecies of ammonites from the Aspidoceratidae Zittel Family, 1895, taxons from genera: *Physodoceras* Hyatt, 1900, *Benetticeras* Checa, 1985 and *Orthaspidoceras* Spath, 1925. This fossil fauna comes from the Ghilcoș Kimmeridgian-Tithonian deposits ("Acanthicum Beds" from the Hăghimaș Mountains, Romania). The species previously described by other authors (Neumayr, Herbich and Preda) were revised here, i.e., the species *P. deaki* (Herbich, 1878) were confirmed as a subspecies of P. wolfi (Neumayr, 1873) after revision of the group; all specimens described by previous authors from this Family were revised. For the first time, the presence of a representative from *the Benetticeras* genus, *B. vaii* Sarti, 1993, has now been highlighted, as has the *Orthaspidoceras lallierianum* (d'Orbigny, 1848) which completes the ammonite list from this Family in the area.

NEW MEDIUM-SIZED MULTITUBERCULATE MAMMALS REMAINS FROM THE HAȚEG BASIN (TRANSILVANIA, ROMANIA)

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Keywords: Romania, 'Hațeg Island', latest Cretaceous, multituberculates, Kogaionidae, intraspecific variability.

Nowadays, parts of the latest Cretaceous 'Hațeg Island' crop out in some sedimentary basins in the inner Carpathians' areas of Romania: Hațeg, Rusca Montană and Transylvanian – in its SW part ('Metaliferi sedimentary area', Alba County), Cluj County and Sălaj County. This former 'island' is worldwide famous due to its peculiar fauna, especially by specific dinosaurs. Besides dinosaurs, important inhabitants of this area were the multituberculate mammals. All the mammals discovered to date on this landmass exclusively belong to the Kogaionidae family. Recent studies point out some size classes for these kogaionids: i. small-sized (*i.e., Barbatodon oardaensis*), ii. medium-sized (*i.e., Kogaionon radulescui*) and iii. large-sized (*i.e., Barbatodon transylvanicus, Kogaionon ungureanui*). The most recent valid kogaionid species described from the 'Hațeg Island' is *Kogaionon radulescui*.

Herein, we report several new fossils belonging to this medium-sized kogaionid recovered from the Hațeg sedimentary basin. Several materials were collected from type-locality Nălaț-Vad, but also new occurrences of the species are herein reported. The morphology and sizes of the new fossils allow us to assign it to the medium-sized kogaionid *Kogaionon radulescui*.

The new material strengthens the knowledge about these mammals and emphasizes once again the essential importance of intraspecific variability in the systematic assignations of the representatives of this family.

THE PLIOCENE MASTODON *Anancus arvernensis* FROM SCORILA (MEHEDINȚI COUNTY, ROMANIA)

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Keywords: mastodon, *Anancus*, Pliocene, Mehedinți, România.

In the Neogene-Quaternary sedimentary Dacian basin, large herbivore fossils are frequent mainly in the southwestern area of the basin, where Pliocene sequences are largely exposed. The Mehedinți County follows this rule, where such finds occurred mainly due to the mining of the Pliocene coal and gravels. A mandible fragment of the Pliocene mastodon *Anancus arvernensis* still bearing the m3 was unearthed in the gravel and sand quarry from Scorila, a small village located nearby the boundary between the Mehedinți and Dolj counties. The rocks from which the mastodon fossil originated belong to the Cândești Formation. Actually, the geological age of this formation is considered Late Pliocene, MN 16a (Late Romanian, Valachian). This find completes the list of localities from which the mastodon species is reported in the Dacian Basin, being a proof of the frequency of this proboscidean in the specified area.

OPTIMIZING THE EXPLOITATION OF ORNAMENTAL ROCK QUARRIES BY ANALYSING THE FRACTURE NETWORK

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Keywords: Marble Quarry, Investigation Methods, Artificial Intelligence, Discrete Fracture Networks (DFNs), block size distribution curves (BSDC).

Within the ERA-MIN project: Artificial Intelligence and Combined Survey Techniques for Stone Quarries Optimization (AI-COSTSQO acronym), a decision support system (DSS) was developed, based on computerized expert systems, artificial intelligence (AI), as well as other algorithms, which could include multi-criteria methods and analytic hierarchy process (AHP).

This system (DSS) included: generating block size distribution curves (BSDC), determining minimum and maximum limits of cuboids and trading volumes as well as establishing a set of rules for trading decisions, finding maximum cuboids from irregular polyhedral (MaxQ), 3D Graphics Representation of Blocks and Mapping/Contouring, Digital Elevation Models (DEM) from Point Clouds and Discrete Fracture Networks (DFNs) and on site Field Investigation, which represented the basis for the development of the components of (DSS).

STUDY ON THE STRONGEST GEOMAGNETIC EVENTS IN THE CURRENT SOLAR CYCLE

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Keywords: Geomagnetic storm, Geomagnetic indices, Solar activity, Wavelet coherence, multi-spectral analyses.

The 25th Solar Cycle began in December 2019 and is heading towards its maximum. Every 11 years or so, the Sun goes through periods of low (minimum) or high (maximum) solar activity, which is associated with the amount of sunspots on its surface. These dark regions, some of which can exceed the size of the Earth, are caused by solar flares that generate strong magnetic fields. Based on the recordings from the INTERMAGNET observatories and the planetary geomagnetic indices from January 2023-April 2024, we performed the analysis of geomagnetic storms and selected the first three strongest events. Following the Fourier, wavelet and wavelet coherence analyses of geomagnetic data taken at one minute, for 20 observatories and comparing them with the physical parameters of solar activity, available on specialized websites, we exemplified in the paper the most relevant characteristics of geomagnetic storms in 2023 and early 2024.

EVALUATION OF GEOMAGNETIC ACTIVITY BASED ON DST INDICES AND THE NUMBER OF SUNSPOTS, IN THE LAST 6 SOLAR CYCLES

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Keywords: solar activity, geomagnetic storm, geomagnetic indices.

Geomagnetic storms with very high amplitudes are usually encountered during the peak periods of solar activity cycles. Their identification is based on the daily number of sunspots, the value of the Dst index and the F10.7 radiation flow. Analysing the data from the last 6 solar cycles, we were able to identify 61 storms during which the Dst index exceeded the value of -200 nT. The phenomenon with the largest amplitude belonged to cycle 22, respectively the third in terms of solar activity in the studied series.

SPACE - TEMPORAL ANALYSIS OF LARGE GEOMAGNETIC DISTURBANCE, CASE STUDY FOR THE STORM OF 24 MARCH 2024

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Keywords: solar activity, geomagnetic storm, geomagnetic indices, aurora borealis.

Large geomagnetic disturbances are fairly rare events, even near the top of the solar cycle. These are mostly caused by particle radiation from the Sun. The flow of these particles is called solar wind. The interaction between the solar wind and the Earth's magnetic field creates a system of magnetospheric and ionospheric currents.

The recording of the geomagnetic field is carried out in geomagnetic observatories and with the help of satellites. Magnetic observatories are permanent measuring stations that monitor geomagnetic field variations with very high precision both in time and in amplitude. Several calculation methods were used to quantify these variations, resulting in various indices of magnetic activity. They are calculated either at the planetary level or for specific areas on Earth (equatorial indices (Ae), daily indices (Ap), planetary indices (Kp), geomagnetic activity index (Dst)). In the present work, the geomagnetic storm produced on March 24, 2024 was analyzed. There are situations where the different way of reporting geomagnetic indices (Dst and Kp) can lead to the classification of the same phenomenon in two different categories (average storm after Dst and strong storm after Kp).

THE BRĂDET QUARRY IN ANINA, A PROPOSAL FOR A NEW SITE OF SPECIAL SCIENTIFIC INTEREST

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Keywords: Kimmerigdian, Tithonian, ammonites, Site of Special Scientific Interst (SSSI), Brădet-Anina.

The Brădet quarry near the town of Anina (Caraş-Severin County, Banat), is highly significant for the biostratigraphy of the Kimmeridgian-Tithonian formations in Romania. The turbiditic, nodular and subnodular limestone of the Brădet Formation outcrop well in the quarry, revealing the sedimentology and the distribution of fossils. The reason for the proposal as a new Site of Special Scientific Interest (SSSI) is the rich fossil invertebrate association with ammonites, belemintes, and echinoids, supporting the Kimmeridgian – Tithonian age.

GEOHERITAGE – GEOSITES AND MUSEUM COLLECTIONS: THE FOSSIL SITE FROM GLOBU CRAIOVEI

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Keywords: Globu Craiovei, paleontological site, Kossovian foraminifera, Leitha limestone, mollusc association.

This paper presents the current state of the paleontological reserve at Globu Craiovei (Iablanița commune, Caraș-Severin County, Romania) and the collections originating from this geosite: the Emil Pop Collection – unpublished and the Luciana Hinculov Collection – published; these collections are hosted by the National Geological Museum. The fossil site at Globu Craiovei is a protected area of national interest (No. 2317, Law No. 5 of 6 March 2000) which corresponds to category III of the IUCN (natural reserve of paleontological type).

GEOSITES - PERSPECTIVES, TRENDS, EDUCATION AND CHALLENGES

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Keywords: Education, environmental legislation, geological protected areas, IUCN.

Declaring a geological protected area and registering it with the IUCN are laborious, but required in order to preserve priceless and unrepeatable values. Unfortunately, even after a protected area has been declared, it is not necessarily protected because the level of information of the general and local public is extremely low and effective protection measures are almost non-existent. Valuable education, a sustained effort by local authorities, as well as educational institutions and non-governmental organizations, are essential to keep as many sites of geological interest in an as good condition as possible.

Challenges, trends and prospects are the elements of a careful analysis of protected areas in Romania, and the issue of education is perhaps the most challenging and difficult, but not impossible, to put into practice. Small steps, starting at the local level, are the handiest solution.

DETERMINATION OF THE AMOUNT OF GEOTHERMAL ENERGY POTENTIALLY EXTRACTABLE FROM GEOLOGICAL FORMATIONS

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Keywords: geothermal energy, rock heat transfer, geoheat exchangers, heat pumps.

In order to make a correct sizing of the geoheat-exchanger (system for capturing energy from geologic formations), one should determine the amount of energy that can be extracted from geological formations. This requires a thorough knowledge of the phenomena influencing heat transfer, the properties of minerals and rocks in geological formations. Also, the parameters of the pipes through which the carrier fluid transports the geothermal energy must be well-known.

The determination of the amount of heat that can be extracted is influenced by the heat energy transfer. Heat transfer modeling and simulation software is very useful as long as the initial data to be inputted are data obtained both from the literature and, more importantly, data from on site analysis and tests.

VEGETAL BIOLOGY

THE EVALUATION OF THE BIOMASS QUALITY OF *Astragalus cicer* AND *Astragalus galegiformis* AND PROSPECTS OF ITS USE IN MOLDOVA

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Keywords: *Astragalus cicer*, *Astragalus galegiformis* 'Vigor', green mass, hay, nutritive value of fodder, silage, specific methane yields.

The aim of this study was to evaluate the quality indices of harvested green mass, silage and hay from *Astragalus* species: local ecotype of *Astragalus cicer* and *A. galegiformis* cv. 'Vigor', grown in an experimental field of the National Botanical Garden (Institute) of Moldova State University. It was determined that the quality indices of the harvested green mass varied among the species and were influenced by the harvesting period: 202.30-245.80 g/kg dry matter with 17.00-22.32 % crude protein, 3.19-4.36 % crude fats, 22.06-35.52 % crude cellulose, 6.17-8.03 % ash, 0.54-1.14 % calcium, 0.26-0.30 % phosphorus, 36.71-43.28 % nitrogen free extract, 0.98-1.00 nutritive unit/kg dry matter and 10.03-10.25 MJ/kg metabolizable energy, 127-166 g digestible protein per nutritive unit. The silages prepared from *Astragalus galegiformis* contained 263.8-268.7 g/kg dry matter with 7.42-7.71 % lactic acid, 0.01-0.08% butyric acid and 2.39-2.73 % acetic acid, 17.31-21.43 % crude protein, 5.20-5.55 % crude fats, 23.30-38.77 % crude cellulose, 7.38-6.06 % ash, 0.60-1.04 % calcium, 0.29-0.30 % phosphorus, 30.94-41.01 % nitrogen free extract. The hay prepared from *Astragalus species* contained 16.60-21.13 % crude protein, 2.48-3.59 % crude fats, 26.33-31.17 % crude cellulose, 7.53-7.98 % ash, 0.80-0.82 % calcium, 0.28 % phosphorus, 41.42-41.71 % nitrogen free extract with feed value 0.80-0.83 nutritive unit /kg, 7.99-8.34 MJ/kg

metabolizable energy and 102-126 g digestible protein per nutritive unit. The fresh and ensiled *Astragalus* substrates for anaerobic digestion had optimal C/N=14.31-18.51 and specific methane yields varied from 273 to 287 l/kg.

THE BIOCHEMICAL COMPOSITION AND NUTRITIVE VALUE OF GREEN MASS AND SILAGE FROM SAFFLOWER *Carthamus tinctorius* L.

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Keywords: biochemical composition, *Carthamus tinctorius*, green mass, nutritive value, silage.

Safflower – *Carthamus tinctorius* L. – is a climate-smart crop, adaptable to variable environmental conditions as compared with other species in the *Asteraceae* family. The goal of this study was to evaluate the biochemical composition and the nutritive value of green mass and silage from safflower, *Carthamus tinctorius* L., cultivated in the experimental plot of the "Alexandru Ciubotaru" National Botanical Garden (Institute) MSU, Chisinau. The safflower whole plants harvested in the flowering period were found to contain 295.0 g/kg dry matter with 9.22% crude protein, 2.34% crude fats, 27.80% crude cellulose, 51.96% nitrogen free extract, 6.61 % starch, 15.8% soluble sugars, 8.68 % ash, 0.94% calcium, 0.30% phosphorus and feed energy values of 17.82 MJ/kg gross energy, 9.83 MJ/kg metabolizable energy, 5.63 MJ/kg net energy for lactation. The quality indices of prepared safflower silage were: 282.5 g/kg dry matter, pH=4.14, 22.2 g/kg lactic acid, 2.7 g/kg acetic acid, 0.1 g/kg butyric acid, 8.42% crude protein, 3.06% crude fats, 33.51% crude cellulose, 46.22% nitrogen free extract, 7.19 % starch, 4.09% soluble sugars, 8.80 % ash, 0.97% calcium, 0.28% phosphorus and feed energy values 18.05 MJ/kg gross energy, 9.21 MJ/kg metabolizable energy, 5.14 MJ/kg net energy for lactation. Our results suggest that safflower contains many nutrients, which make it suitable to be used as alternative fodder for livestock.

BIOMETRIC CHARACTERISTICS OF FLOWERS, FRUITS AND SEEDS OF AMERICAN POKEWEED (*Phytolacca americana* L.)

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Keywords: American pokeweed, bio-morphological characteristic, flower, fruit, seed.

The economic and scientific interest in *Phytolacca americana* L. (American pokeweed) plants has increased in recent years due to its good adaptation to the European climate and high pharmacological potential. The purpose of this study was to evaluate the bio-morphological traits of different parts of P. americana plants growing wild in the Slovak Republic and propagated by seeds in the Republic of Moldova. Biometric assessments were performed using AxioVision software applied to microscopic images of American pokeweed buds, flowers, stamens and berries. The duration of phases for plant development in the first year of plant growing from seeds were determined. The duration of the vegetation cycle of American pokeweed from germination of seeds to winter dormancy was 160-210 days. In cultivated plants, the racemes were longer (145.71 mm) and heavier (91.97 g), and the weight of berries harvested from one raceme was 3-4 times greater than berries from a raceme of wild American pokeweed. A direct correlation was found between the length of the racemes and the number of berries per raceme of American pokeweed from both countries. Pearson correlation coefficients were 0.7125 and 0.7015 respectively, for the samples from the Slovak Republic and the Republic of Moldova. The height, diameter, diameter/height ratio of bud and berries, as well as the

length of stamens, diameter of flowers and length and height of seeds were measured. Taking into account the productivity of this plant, which yields 250-550 seeds per raceme, and the possibility of its multiplication by roots, technologies must be developed for using various parts of this plant for the benefit of humans.

DETERMINATION OF THE MORPHOMETRIC PARAMETERS AND REPRODUCTIVE ABILITY OF BEECH SEEDS (*Fagus sylvatica*) OF SLOVAK ORIGIN

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Keywords: *Fagus sylvatica*, beech seeds, morphometric parameters, reproductive ability, viability.

Screening beech seeds of various origins to identify their reproductive and adaptive capabilities is important for the restoration of beech forests in Europe, especially in conditions of climate change. The aim of this study was to evaluate the morphometric characteristics and viability of beech seeds from five populations, collected in different years in the Slovak Republic. In this research, the seeds from Nitra-19; Detva-22; Orava-22 and two population of Roznava-22 were involved. The length of the seed ranged from 13.00 to 19.50 mm, and the width - from 5.50 to 12.50 mm. The eccentricity index varied from 1.74 to 1.81. The average weight of a thousand seeds in the populations, collected in different years, did not differ significantly, and modified in limits from 237.40 to 311.10 g. According to the Pearson correlation coefficient (0.7127), the closest relationship was found between the weight of seed and their width. The relationship between seed weight and length was less strong (0.6450). The viability of seeds, determined by two tests using 2.3.5-triphenyltetrazolium chloride and hydrogen peroxide solutions, ranged from 61.75 to 92.00%. The seeds from the Roznava-22 (2) and Detva-22 populations had the highest viability. There was no strong correlation between seed weight and viability (0.3639), as

well as between seed weight and the altitude above sea level where the seeds were collected (0.2088). At the same time, a close correlation was found between seed viability and the altitude above sea level where the seeds were collected (0.6802). Thus, the data showed that beech seed populations from the Slovak Republic had homogeneous morphometric parameters, but differed significantly in terms of viability, which depended on the height of the beech plant growth.

IDENTIFICATION OF THE TOMATO GENOTYPES RESISTANT TO THERMAL STRESS USING FACTORIAL AND CLUSTER ANALYSIS

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Keywords: tomato, genotypes, resistance, temperature, factorial analysis, cluster analysis.

The paper presents the results of assessing the resistance of some genotypes selected from the mutual combination F_2 Prestij x Pontina/ F_2 Pontina x Prestij of tomato to stressful temperatures (42°, 10°C). Seedlings grown at 25ºC served as a control variant. The analysis of the variability of the resistance character was carried out based on the length of the embryonic radicle, stem, whole seedling and germination. In most cases, stressful temperatures caused significant inhibition of growth organs. Through cluster analysis (*k*-means method), the parents – 204/I/2 pl. F_3 Prestij x Pontina and Prestij were identified, with the highest values of the radicle, stem and seedling length characters at temperature 42°C and 205/II/3 pl. F_3 Pontina x Prestij, 205/II/5 pl. F_3Pontina x Prestij, Pontina that showed increased resistance based on seed germination at 10°C, which offers opportunities to use them in breeding programs as reliable sources of resistance.

PRELIMINARY DATA ON THE FLORA OF THREE VALLEYS OF THE JIU GORGE NATIONAL PARK, ROMANIA

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Keywords: alien plant, bioforms, ecology, medicinal plant, Natura 2000, protected plants, *Tozzia*.

The purpose of this study was the preliminary analysis of the vascular flora in the valleys: Bratcu, Chitu, and Polatiște, in the Jiu Gorge National Park (JGNP). The flora study also aimed to track the presence/absence of the protected species *Tozzia carpathica* Woloszczak. The research took place between May and September 2022. Following this study, the species *T. carpathica* Woloszczak was not identified in the studied areas. Still, following the taxonomic analysis, we identified 75 taxa from 37 families in the Bratcu Valley, 147 taxa, belonging to 47 families, in the Chitu Valley, and 113 taxa, from 47 families in the Polatiște Valley. Following the analysis of the ecological peculiarities, most of the species were meso-hygrophilous, mesophilic, mesothermic, and eutrophic. In terms of bioforms, hemicryptophytes predominated in all three valleys. The most numerous invasive species were identified in the Bratcu Valley, and the most medicinal plants in the Chitu Valley. The studies will be extended in terms of both seasonal perspective and habitats.

Ranunculus binatus Kit. ex Rchb. (RANUNCULACEAE) FROM OLTENIA, ROMANIA

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Keywords: *Ranunculus binatus*, chorology, Oltenia, Romania.

The present work started from the collection of plant material that, at a first analysis regarding the morphological characters, was classified as *R. auricomus*, but the basal leaves showed incisions that clearly separate it from the above-mentioned species. The detailed laboratory analysis of the material collected from Preajba - Dolj county led us to the conclusion that the studied material belongs to *Ranunculus binatus* Kit. ex Rchb.

Opinions regarding the taxonomic position of this taxon are divided. In Romanian literature, this species is included in *Ranunculus auricomus* var. *binatus*, but foreign literature accepts the scientific name also presented by us, rarely *R. auricomus* subsp. *binatus* (Kit. ex Rchb.) Jasiewicz.

The initial description of this taxon was based on material collected from Transylvania (Romania) (1832).

The present paper discusses the material collected by the author and brings new contributions regarding the chorology of this species in Romania. Moreover, a map distribution of the species is also made in correlation with the average annual precipitation and temperatures in Romania.

ANIMAL BIOLOGY
INVERTEBRATES

MARINE AND TERRESTRIAL MOLLUSCS FROM BERMUDA – A NEW COLLECTION FROM THE PATRIMONY OF THE "GRIGORE ANTIPA" MUSEUM (BUCHAREST, ROMANIA)

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Keywords: gastropods, bivalves, polyplacophorans, Bermuda, "Grigore Antipa" Museum.

During a survey of Bermudian shores between June 18th and 29th, 2000, regarding peracarid crustaceans, a small survey was done on sandy beaches around Bermuda. The study was part of the "Bermuda Biodiversity Project," supported by the Bermuda Natural History Museum and the Bermuda Zoological Society, in collaboration with the Institute of Medical Biology (Vienna, Austria).

In this study, 354 molluscan specimens were collected from three classes (Gastropoda, Bivalvia and Polyplacophora), belonging to 35 families, 62 species and 55 genera, from 11 stations (from Somerset Island up to St. George Island). We discuss the historical presence of introduced gastropod species (*Polygyra plana, Rumina decollata, Bradybaena similaris, Otala lactaea* and *Euglandina rosea*), the presence of unusual species, like the Indo-Pacific ostreid, *Hyotissa hyotis* (Linnaeus, 1758) and the probably first mention of *Isognomostoma isognomostomos* (Schröter, 1784) outside its range.

This collection is the only one of its kind from this area, which recently entered in the museum's patrimony. The collection of molluscs from Bermuda is part of a collection of exotic molluscs (Belize, Philippine, Angola), a generous donation made by Dr. Angela Petrescu and Dr. Iorgu Petrescu, esteemed researchers of the museum.

ON TYPE SPECIMENS OF CAVERNICULOUS ISOPODS DESCRIBED BY THE FAMOUS ROMANIAN SCIENTIST EMIL RACOVIȚĂ IN THE COLLECTIONS OF THE "GRIGORE ANTIPA" NATIONAL MUSEUM OF NATURAL HISTORY FROM BUCHAREST, ROMANIA

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Keywords: type specimens, isopods, Racoviță, "Grigore Antipa" Museum.

Emil Racoviţă (1868-1947) was the founder of Biospeleology. The collection of Emil Racoviță and his collaborators from Cluj, René Jeannel and Alfred Chappuis harboured more than 20,000 subterranean specimens, which were deposited at the Institute of speleology from Cluj, part of the "*Biospeologica*" Collection. In 1948, the Museum from Bucharest received an important donation from Andrei Racovitză, the son of Emil Racoviță.

We provide details for three type (sintype) specimens identified in the Crustacean collection (non-type). Three jars hosting three species of isopods were identified, one cirolanid and two spheromatid ispods have been identified, marked with a "cotype" label. *Typhlocirolana gurneyi* was described by Emil Racoviță in 1912 based on material collected from a cave in Algeria, Missergin. The other two are: *Caecosphaeroma (Vireia) burgundum burgundum* Dollfus, 1898 and *Monolistra (Typhlosphaeroma) bericum bericum* (Fabiani, 1901). We discuss the rediscovery of the type specimen of the cavernicolous isopod *Typhlocirolana gurneyi* Racovitza, 1912, now identified in the collections of the "Grigore Antipa"National Museum of Natural History and the conditions where these specimens had been collected and restoring these to the national patrimony. This paper is dedicated as an homage to the colossal work and great scientific personality who was Emil Racoviță and to his immense contribution to the history of biospeoleology.

LADYBIRDS (INSECTA: COCCINELLIDAE) FROM THE MUSEUM OF ENTOMOLOGY, INSTITUTE OF ZOOLOGY, REPUBLIC OF MOLDOVA

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Keywords: Museum of Entomology, collection, Coccinellidae, ecosystem, distribution, ecology.

The insect collection of the Museum of Entomology is one of the most complete the Republic of Moldova, with about 15 thousand insect species. Research on ladybirds in the Republic of Moldova started at the beginning of the 20th century. The inventory of the collection of Coccinellidae housed in the Museum of Entomology allowed to reveal 1037 specimens belonging to 36 species. The specimens were collected between 1949 and 2005, from the forest and agricultural fields of the Republic of Moldova, as well as from 7 other countries: Australia, Cuba, North Korea, Kyrgyzstan, Ukraine and Russia. The paper includes the list of species, localities, countries, and some ecology of ladybirds.

NEW DATA ON INSECTA FROM OLD ORHEI, REPUBLIC OF MOLDOVA

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Keywords: Dragonfly, coleoptera, new record, protected area, Republic of Moldova.

The paper includes first data about the species diversity of insects (Coleoptera and Odonata) from Old Orhei, Republic of Moldova. A total number of 44 insect species were revealed, of which 14 Odonata and 30 Coleoptera. The research carried out in alfalfa allowed highlighting a wide spectrum of coleoptera with different trophic preferences, with the predominance of phytophagous and zoophagous species.

INVASIVE INSECT SPECIES REPORTED IN THE CITY OF SIBIU, UNDER THE CLIMATIC CONDITIONS OF 2021-2024

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Keywords: *Corythucha arcuata* (Say, 1832), *Corythucha ciliata* (Say, 1832), *Oxycarenus lavaterae* (Fabricius, 1787), Sibiu; Transylvania; Romania.

The present study investigates the presence and impact of the invasive species *Corythucha arcuata* (Say, 1832) (Hemiptera: Heteroptera: Tingidae), *C. ciliata* (Say, 1832) (Hemiptera: Heteroptera: Tingidae) and *Oxycarenus lavaterae* (Fabricius, 1787) (Heteroptera: Lygaeiodea: Oxycarenenidae) in the city of Sibiu, Romania, under the influence of climatic conditions from 2021 to 2024. The research focused on signaling and monitoring the distribution, population density and ecological effects of these species in various urban ecosystems, including parks, gardens and periurban forests. The collected data showed a significant increase in the populations of *C. arcuata* and *C. ciliata*, especially in areas with a majority of oak and sycamore species. *O. lavaterae* was predominantly associated with lime trees, showing a more even distribution throughout the city. The climatic conditions during the period of the study, characterized by hot and dry summers, favoured the development and expansion of these invasive species, thus amplifying their impact on the local vegetation. Observations revealed severe defoliation of oak and sycamore trees, a decline in tree health and a reduction in associated biodiversity. This study highlights the need to implement integrated management strategies to control the spread of these invasive species and minimize negative impacts on urban ecosystems and the local economy. Recommendations include continuous monitoring of populations, use of natural predators, responsible application of chemical measures, and promotion of ongoing research to develop effective and sustainable control methods.

THE STUDY OF INSECTS IN AN AGRICULTURAL ECOSYSTEM, A VEGETABLE GARDEN IN THE ORLEȘTI VILLAGE OF VÂLCEA COUNTY

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Keywords: insects, vegetable garden, Orlești village, Vâlcea County.

The study carried out in a vegetable garden from Orlești village, Vâlcea county, aimed to identify useful and harmful fauna by collecting insects. For this purpose, eight Barber traps were installed, one in each crop: onions, garlic, tomatoes, peppers, cucumbers, carrots, beets and corn. Following the systematic determination and categorization, the following insect orders were identified: Coleoptera, Orthoptera, Lepidoptera and Hymenoptera. The traps were operated from April through August 2023, and samples were collected while crops were in full vegetation. Insects were collected from the traps on a weekly basis, preserved, labelled, and identified using specialized identifiers. In total, 275 specimens were collected, with most species captured from the tomato crop totalling 92 specimens. The analysis of the captured species revealed that 87.53% of the insects belonged to the useful entomofauna, while 12.47% were crop-specific harmful species.

VERTEBRATES

THE COMPARATIVE ANALYSIS OF SOME REPRESENTATIVE BACTERIA OF BIRD GUT MICROBIOTA IN URBAN AND RURAL AREAS

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Keywords: gut bacteria, rural and urban areas, birds.

Environmental changes significantly influence the health and behaviour of animals and determine their adaptation to new living conditions. Thus, urbanization, which is intensifying worldwide, represents new ecological and evolutionary challenges for animals. The state of the intestinal microbiota is an indicator that reflects the influence of environmental factors on organisms, as it is known that the intestinal microbiota mediates processes such as digestion, immunity and resistance to pathogens. Thus, in the conditions of urbanization and anthropization, new questions arise about how the urban environment shapes intestinal microbial communities and how the intestinal microbiome influences the survival of the host organism to the action of anthropogenic factors. The research on some representatives of obligate and facultative bacteria in the intestinal content of birds in urban and rural environments highlighted the dominance of certain groups of bacteria in the intestinal content depending on the living environment. Thus, facultative bacteria (*E. coli*, enterococci) quantitatively predominate in the digestive tract of rural birds, while beneficial obligate bacteria (bifidobacteria and lactobacilli) predominate in the intestinal contents of urban birds. At the same time, in the gut microflora of urban birds, a positive correlation was established between

enterococci, bifidobacteria and lactobacilli in keeping the number of *E. coli* at a lower level, which does not allow for the development of intestinal dysbiosis. The obtained data allow us to assume that the living environment, as well as the frequent and close contact of animals (in the given case of birds) with humans dictates the incidence of obligate beneficial and facultative pathogenic bacteria of the intestinal microflora, which ultimately determines the health and well-being of the bodies.

BIRD FAUNA AND THE CONSERVATION STATUS OF SOME RESERVOIRS IN THE MIDDLE BASIN OF THE BÂRLAD RIVER (ROMANIA)

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Keywords: bird fauna, trends, reservoirs, Bârlad River basin, Natura 2000 network.

Our study presents data on the diversity of bird species recorded in the perimeter of four reservoirs from the middle basin of the Bârlad River: Motoșeni on the Zeletin River, Pereschiv on the Pereschiv River, Cuibul Vulturilor on the Tutova River and Râpa Albastră on the Simila River. Except for the Pereschiv reservoir, the others are part of ROSPA0159 Lakes around Măscurei, respectively, ROSPA0167 Bârlad River between Zorleni and Gura Gârbovățului. We collected our data during three periods of field monitoring activity (2006 – 2012, 2018 – 2019, and 2022 – 2023). We identified 162 bird species, 90 as breeding species in the area, and we present quantitative data for the observed bird species, too. The bird species related to the aquatic ecosystem are dominant in terms of diversity and population all time during the year. We notice the relevance of this territory as a migration stopover point for the bird fauna in eastern Romania. We mention *Tadorna ferruginea* as breeding species and the constant presence of adult and juvenile birds of *Haliaeetus albicilla* during the breeding season on the Pereschiv reservoir. We recorded 42 bird species from the Annex 1 of the Birds' Directive and 43 appearing in the Annex 2 of the same directive. We found 27 bird species included in the Romanian Red Book of Vertebrates, 4 as critically endangered species and 6 as endangered species in our country. We assess the proposal to include the Pereschiv reservoir in the Natura 2000 network, through location and ornithological significance in the area related to the Motoșeni reservoir.

THE WATERBIRDS OF THE OEȘTI, CERBURENI AND CURTEA DE ARGEȘ DAM BASINS (ARGEȘ COUNTY, ROMANIA) OBSERVED DURING 2023

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Keywords: waterbirds, breeding, migration, dam basins, protection.

The first published information about the avifauna of the Oești, Cerbureni and Curtea de Argeș Dam Basins, from the upper sector of the Argeș River, are shown in this paper. During 2023, 25 waterbird species were found here, 7 of them, 28% of all, *Ciconia nigra* (Linnaeus, 1758), *C. ciconia* (Linnaeus, 1758), *Ixobrychus minutus* (Linnaeus, 1766), *Nyctycorax nyctycorax* (Linnaeus, 1758), *Ardea purpurea* Linnaeus, 1766, *A. alba* Linnaeus, 1758, *Egretta garzetta* (Linnaeus, 1766) and *Mycrocarbo pygmaeus* Pallas, 1773, being listed in the Annex I of Directive 2009/147/EC. 6 species, 24% of all, *Cygnus olor* (Gmelin J. F., 1789), *Anas platyrhynchos* Linnaeus, 1758, *Gallinula chloropus* (Linnaeus, 1758), *Fulica atra* Linnaeus, 1758, *Ciconia ciconia* (Linnaeus, 1758) and *Larus michahellis* Naumann, 1840, were certain breeders in the area, and 2 species, 8% of all, *Tachybaptus ruficollis* (Pallas, 1764) and *Ardea cinerea* Linnaeus, 1758, probable breeders. While their avifauna is not as diverse as the one of the lower wetlands, the dam basins, though created by economic reasons, prove to be hotspots for the waterbirds, mainly in the period of passage and in winter, and, consequently, they need minimal avifaunistic protection: partially silted areas, covered with characteristic vegetation, not disturbed by people. Additional considerations about the distribution, phenology, dynamics and other factors that influenced the occurrence of the birds in the area were performed in the paper, too.

A CATALOGUE OF THE COLLECTION OF TARSOMETATARSI (AVES) FROM THE HERITAGE OF THE "GRIGORE ANTIPA" NATIONAL MUSEUM OF NATURAL HISTORY, BUCHAREST, ROMANIA

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Keywords: bird, collection, tarsometatars, vertebrate, museum, Bucharest.

The bird collection of the "Grigore Antipa" National Museum of Natural History mainly consists of naturalized-mounted birds, skins, skeletons and bones, eggs, nests, stomach contents and pellets of birds, etc. These are accompanied by a collection of 844 bird tarsometatarsi. This type of collection was initiated by Robert Ritter von Dombrowski during 1895-1912. He collected and prepared 89 tarsometatarsi (89 species), which were to be presented in the new exhibition of the Museum, opened in 1908 in a new building. Unfortunately, these preparations were no longer exhibited, as the initiative was interrupted by the outbreak of the First World War, when Dombrowski was forced to leave Romania. They were to illustrate, in the public exhibition, the great variety of birds, their adaptations to the living environments and to the way of feeding.

A large number of tarsometatarsi, 448 specimens, were collected by Ștefan Negru, a zoologist, specialist in forest entomology, who worked as a museographer at the "Grigore Antipa" Museum. His scientific pursuits included, in addition to forest entomology, the research of mallophagans, for which he collected a large number of passerines, from which he kept only the tarsometatarsus. The collection also contains 210 tarsometatarsi collected by Aurel Papadopol, the ornithologist of the "Grigore Antipa" museum between 1946-1988. Other 97 specimens were collected by the museum specialists: Matei Tălpeanu, ornithologist, Dumitru Murariu, mammalogist, Nicolae Semen, taxidermist, Mihai Băcescu, oceanologist, Ș Ștef Torcea, mammalogist and Ioan Dianu, donor.

ECOLOGY
ENVIRONMENT PROTECTION

THE WARM WINTER OF 2023-2024 IN SOUTHWEST ROMANIA – A CLIMATIC RECORD

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

In the year 2023, climate warming continued to remain in the plateau phase. After the warm summer (C) with long and intense tropical heat waves, followed a very warm autumn (FC), which was the warmest in the history of the climate in Oltenia and, as a whole, normal in pluviometric terms (N). The winter of 2023-2024 was very warm (FC) with an overall seasonal average of 3.88°C and a deviation from normal of 4.83°C, being the warmest winter in the entire history of climate records for Oltenia. February was warm on all days with mean daily highs ≥ 10.0°C on 26 days out of 29 (89.7% of days of the month) and ≥ 15.0°C on 14 days (48.3% of days). Throughout the winter, six winter heat waves were recorded in the intervals: 1-3.XII (3 days), 11-31.XII (21 days), 1-7.I (7 days), 16-19 .I (4 days), 25-31.I (7 days) and 1-29.II (29 days) totalling 71 days, i.e. 78.0% of winter days and a single cold wave in the interval 9-15.I with a duration of 7 days. No monthly temperature and rainfall records were recorded. The seasonal thermal average was 3.88°C and the deviation from normal (calculated for the last century) was 4.83°C, thus being the warmest winter in the history of the climate in Oltenia and surpassing the winter of 2006-2007 which occupied the first place until this year (2024). Most very warm winters (FC) have been recorded since 2000 (8 winters out of 25, i.e. 32.0%). So, in general, we are currently in a period of climate warming, a process related to the cycles of climate warming and cooling studied by the Serbian physicist Milankovitch, whose causes are of a cosmic nature.

NEW BIOPLASTIC MATERIALS WITH BIOLOGICALLY ACTIVE PROPERTIES UNDER SIMULATED COMMERCIAL USAGE CONDITIONS

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Keywords: bioplastics, antibacterial activity, ecotoxicity, water absorption.

The obtained data demonstrated that the investigated bioplastics, comprised of a polymer matrix based on polylactic acid supplemented with antimicrobial and antioxidant compounds, exhibited a generally patchy appearance with air bubbles present in some samples. Additionally, insoluble particles of reddish-brown colour, varying in terms of agglomeration, were observed. The samples displayed varying degrees of water absorption, ranging from 0.6% to 3.6%. The physical structure of bioplastics was also reflected in the migration of biologically active components under simulated usage conditions, resembling real-world scenarios. Notably, a relatively high migration was observed from the material's surface enriched with cinnamon. Furthermore, the study results indicated that the tested formulations inhibited the growth of *Staphylococcus aureus*, *Escherichia coli*, and *Salmonella enterica*. Based on these results, we could expect an extended shelf life of the packaged products by at least 24 to 48 hours compared to conventional packages. Ecotoxicity assessments revealed that the survival rate of the rotifer *Brachionus calyciflorus* was, in most cases, 100%. The data suggested that the tested bioplastics posed minimal risk to terrestrial and aquatic ecosystems, indicating low environmental impact.

ASSESSMENT OF THE ECOLOGICAL STATUS/ECOLOGICAL POTENTIAL FOR DESIGNATED WATER BODIES ON THE JIU RIVER ACCORDING TO THE WATER FRAMEWORK DIRECTIVE

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Keywords: Water Framework Directive 60/2000/CE, environmental objectives, water body, multimetric index, anthropic pressures.

The structure and composition of the communities present in an aquatic ecosystem is a consequence of both the characteristics of the environment and the anthropic pressures exerted on it, information that lies at the basis of the evaluation of the ecological status, respectively of the ecological potential for water bodies. The identification, delimitation and classification of surface water bodies is carried out in order to determine the main elements that form the basis for the process of evaluating the quality of water resources and establishing the environmental objectives that must be met by them. The concept regarding the evaluation of the ecological status/ecological potential using the methodology proposed by the Water Framework Directive differs fundamentally from previous approaches in the field of water quality carried out at the national level. Thus, the present study describes the current approach according to which biological elements represent the integrator of all types of pressures, and hydro-morphological, general physical and

chemical indicators, specific synthetic and non-synthetic pollutants are only supporting elements in establishing the ecological status. The main objective of this study is to establish the ecological status/ecological potential for all designated water bodies on the Jiu River, from its source to the confluence with the Danube River, with an emphasis on the impact of anthropic pressures, on the measures that can be implemented to improve water quality, as well as their classification in quality classes and categories of use.

THE IMPACT OF HYDRO-TECHNICAL WORKS ON AQUATIC ECOSYSTEMS. STUDY CASE: THE JIU RIVER FROM THE SPRINGS TO THE DANUBE CONFLUENCE

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Keywords: water body, anthropic impact, aquatic biocenoses, hydrotechnical works.

The paper discusses the results obtained by the team of specialists regarding the impact of the most important hydrotechnical works on the Jiu River, i.e. damming, regularization and transverse barrage works, focusing on the Livezeni, Vădeni, Târgu-Jiu, Turceni and Işalnița permanent accumulation dams, and presenting their effects on the composition of aquatic biocenoses, respectively on the state or ecological potential of the water bodies designated on the Jiu River. The study covers the course of the river from the springs up to the confluence with the Danube River. In order to evaluate the anthropogenic impact of hydro-technical works, physical, chemical and biological indicators were used according to DCA 60/2000/CE and different methods were applied: the water quality index method (ICA), the global pollution index method (GI) and the matrix method according to the relevant literature. For the water quality index (ICA), data related to the bacteriological load of the investigated water body were additionally used. All methods were harmonized

with the interpretations proposed by DCA 60/2000/CE in order to have a unitary assessment of the anthropogenic impact on water bodies and to synchronize the obtained results with the new method proposed by this project (Taxonomic Correspondence Index-ICT). The materials used in this research are samples collected for physical-chemical, biological and bacteriological determinations, respecting the sampling and analysis technique in accordance with the regulations in force. The methods for evaluating the anthropogenic impact using biological parameters were represented by relative cleanliness (C%), relative impurity (I%), the Saprobic index method (S), the species scarcity method and the EPTT index method (*Ephemeroptera, Plechoptera, Trichoptera*, groups with species sensitive to anthropogenic impact).

HYDROBIOLOGICAL PARTICULARITIES OF THE AREA OF NATIONAL INTEREST OF BALTA CILIENI, BĂILEȘTI FROM THE OLTENIA PLAIN

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Keywords: Cilieni pond, eutrophication, gastropods, metal ions, Oltenia.

Located in the Oltenia Plain, the Cilieni pond belongs to the category of natural areas protected of national interest and corresponds to IUCN category IV, being declared by HCJ 26/1994 and then by law no. 5/2000 regarding the approval of the National Territorial Development Plan - Section III - Protected Areas. It has an area of 83.14 ha and is part of the Danube's lower hydrographic basin, the supply source being the Balasan stream and the springs that emerge at the bottom of the pond. Considering the structural particularities of the biocenoses dominated by the populations of aquatic and marsh macrophytes, the large amount of phytoplankton and the composition of the zoobenthos, the pond meets all the characteristics of eutrophic ecosystems. Within the phytoplankton, the main groups that witness an intense development during the summer and produce the water bloom process are: Cyanophyceae (*Microcystis aeruginosa, M. flos-aque),* Euglenophyceae (*Euglena acus*), Bacilariophyceae (*Achnanthes minutissima, A. microcephala, Cyclotella chaetoceras, Navicula cryptocephala, N. longirostris, Nitzschia acicularis, N. gracilis, Synedra acus*), Chlorophyceae (*Chlamydomonas* sp., *Chlorella vulgaris, Scenedesmus bicaudatus, S. granulatus, Spirogyra* sp., *Volvox aureus*). The benthic facies is

composed of a thick layer of organic mud and vegetable detritus, which explains the tendency to clog the pond. The main groups of benthic invertebrates are: oligochaetes, chironomids, plecoptera, bivalves. Gastropods constitute the dominant group in the benthos, with 15 species identified. The following are characterized in terms of frequency and numerical density: *Viviparus acerosus, Physella (Costatella) acuta, Radix balthica, Lymnaea stagnalis, Planorbis planorbis, Planorbarius corneus*. The analyses carried out through the mineralization process illustrate the ability of the pulmonated snail species *Radix balthica*, *Lymnaea stagnalis* și *Planorbarius corneus* to accumulate metal ions such as Mn^{2+}, Fe^{2+}, Cu^{2+} and Zn^{2+} in direct correlation with the chemical characteristics of the soil in the lacustrine ecosystem.

THE BIOLOGY AND ECOLOGY OF THE MUDSNAIL *Ecrobia maritima* (GASTROPODA: LITTORINIMORPHA: HYDROBIIDAE) AT THE ROMANIAN BLACK SEA COAST

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Keywords: Black Sea, Gastropoda, *Ecrobia maritima*, life cycle, ecology, development.

The ecology of the mudsnail *Ecrobia maritima* (Milaschewitsch, 1916) was investigated in dwarf-eelgrass meadows from the southern part of the Romanian Black Sea coast. Quantitative samples were taken using a hand-held corer, and the collected snails of *E. maritima* were counted, measured and weighed. The shell length ranged from 1.19 to 4.0 mm. The maximum density (4248 ind.$\cdot m^{-2}$) and the maximum biomass (12.48 g fresh wt$\cdot m^{-2}$) of the mudsnails were recorded in July. In the study area, *E. maritima* is a strictly annual species. The average life span was estimated at approximately 12–14 months. Recruitment took place over a brief period in May and June, after which the breeding population dies. Under unfavourable conditions (strong storms, low temperature, high pressure from predators) *E. maritima* was observed to burrow deeply into the sediment. The mode of development of *E. maritima* from the Black Sea was inferred through the Scanning Electron Microscopy (SEM) examination of the morphology and microsculpture of the protoconch and teleoconch.

THE COMPLEXITY OF THE RHIZOSPHERE - THE "UNSEEN" PART OF THE SOIL – A SHORT REVIEW

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Keywords: biodiversity, rhizosphere, rizodeposition, root exudates, soil.

Soil is where most of the biodiversity on Earth exists, and the rhizosphere is probably the most dynamic habitat and certainly the most important area in terms of defining the quality and quantity of terrestrial human food resources. Despite its central importance to all organisms, very little is known about the functioning of the rhizosphere. The processes taking place in the rhizosphere play a key role in the nutrient circuit in terrestrial ecosystems. There is a growing need to understand the processes in the rhizosphere area so that we can effectively manage ecosystems or harness their potential benefits, either to mitigate or stop the negative consequences of anthropogenic intervention.

SPIDERS IN THE COLD SEASON 2023-2024 FROM THE NORTH-WESTERN PART OF ROMANIA (TINCA AREA, BIHOR COUNTY)

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Keywords: spiders, cold season, temperatures, Tinca area, Bihor County.

The paper presents species of spiders identified in the 2023-2024 cold season in the north-western part of Romania (Tinca area, Bihor County). The high temperatures of this period favoured the identification of 13 spider species belonging to 9 families and 13 genera. Also, some phenological data unpublished in the scientific literature were obtained.

A STUDY OF THE COMPLEX EFFECTIVENESS OF BIOLOGICAL AGENTS IN APPLE ORCHARDS IN TERMS OF CLIMATE CHANGE IN THE REPUBLIC OF MOLDOVA

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Keywords: *Cydia pomonella, Bacillus thuringiensis* subsp. *Kurstaki*, para-aminobenzoic acid (pABA), apple orchard, entomopathogenic bacteria.

Discussion on the impact of climate change on various aspects of life is of increasing concern to the scientific community. Providing food for the growing population in adverse climatic conditions is a major challenge. Applying environmental approaches in this direction is key to restoring ecological balance. The paper presents how the foliar fertilization with biological products in different doses and combined with two types of foliar fertilizers, applied to an apple tree orchard. The research was carried out within the Institute of Genetics, Physiology and Plant Protection of the MSU of the Republic of Moldova. The article presents the results of the study of efficiency of fruit-cultures treatment with aqueous suspensions of entomopathogenic bacteria *Bacillus thuringiensis* subsp. *kurstaki* and *Bacillus thuringiensis* var. *thuringiensis* with addition of para-aminobenzoic acid derivatives solutions in concentrations 10^{-2}, $10^{-4,}$ 10^{-6} Mm. An increase in the average weight of fruits and tubers and a reduction in disease and insect damage were observed in all variants of the experiment compared to the control. The studied derivatives exhibited higher biological activity at the lower concentration than *para*-aminobenzoic acid (pABA). The best trial was treatment with a mixture of *Bacillus thuringiensis* subsp. *kurstaki* with the addition of an aqueous solution of pABA at concentrations of 10^{-4} and 10^{-6} Mm. It was shown that the use of *Bacillus* spp. with the addition of the para-aminobenzoic acid

derivatives solutions leads to an improvement in the functional state of plants, contributing to the activation of the active resistance mechanisms to the action of the stress factors. The obtained results demonstrate the possibility of using entomopathogenic bacteria in a tank mixture with pABA for the creation of biological preparations as alternatives to pesticides and the development of biological methods of plant protection.

IMPROVEMENT OF *IN VITRO* DEVELOPMENT OF *Mentha piperita* L. AND *Mentha longifolia* (L.) Huds. VARIETIES

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Keywords: *Mentha longifolia in vitro* culture, microshoots, *M. piperita in vitro* growth factors, in vitro plant conservation, aromatic and medicinal plants.

The aim of this paper was to study the *in vitro* germination and micropropagation potential of two mint cultivars, namely *Mentha piperita* and *M. longifolia. In vitro* germination of *Mentha longifolia* seeds has been stimulated with gibberellic acid. Using an experimental system with two stages of three months, we obtained 50 microshoots per culture from every variety. Two variants of the basal Murashige - Skoog medium supplemented with benzyl adenine (BAP), 1 - naphthylacetic acid and yeast extract have been optimal for *in vitro* microshoot multiplication of the both cultivars. The proportions of the growth factors differed, i.e. 5:1:100 mg/L for *Mentha piperita* and 3:0.5:100 mg/L for *M. longifolia*. The capacity of both mint cultivars to maintain their viability for a long period between transfer on a fresh culture medium was evident. We developed an *in vitro* conservation strategy and obtained an increased number of regenerants that can ensure a considerable amount of biomass to cover the required vegetal material useful in cosmetic and pharmaceutical industry.

In vitro INDUCTION AND MULTIPLICATION OF CALLUS CULTURES PRODUCING SECONDARY METABOLITES IN *Pimpinella anisum* SPECIES

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Keywords: anise callus culture, anise *in vitro* development, anise secondary metabolites, *in vitro* plant growth factors.

The aim of our research consisted in optimising the secondary metabolite production in *Pimpinella anisum* callus lines cultures by determining the type and concentration of the efficient elicitors. In order to obtain a consistent amount of callus *in vitro*, we started to obtain plantlets by *in vitro* germination of seeds, free of contaminants, as source of vegetal material, after which the inocula were subcultivated on different variants of the basal medium Murashige - Skoog (MS). We used yeast extract, benzylaminopurine (BAP), 2.4 - dichlor - phenoxyacetic acid (2.4 -D), naphtylacetic acetic acid (NAA) and indolilacetic acid (IAA) in different combinations and concentrations, as growth factors. The culture medium variant supplemented with 100 mg/L yeast extract associated with 5 mg/L BAP and 1 mg/L NAA triggered the optimal value regarding growth of callus biomass. The calli grown on a variant of nutritive culture medium supplemented with NAA and BAP in equal concentrations (1 mg/L) had the highest concentration of flavonoids (30±2.49 mg ERU/g dry substance) and polyphenols (11,5 ±0.49 mg EAG/g dry weight). Triterpenoid accumulation in callus lines was most stimulated by subcultivation on a medium with 2.4 - D and IAA in concentration of 1 mg/L, associated with yeast extract (100 mg/L).

BIOLOGICAL AND ECOLOGICAL ATTRIBUTES OF PLANT SPECIES PRESENT IN THE PASTURES OF SOME MOUNTAINS IN THE SOUTH-WEST OF THE FAGARAS MOUNTAINS

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Keywords: pastures, Făgăraș Massif, biological attributes, ecological attributes.

In the southwest of the Fagaras massif, on the territory of six mountains, following the inventory of plant species, our study aimed at characterizing the biological and ecological attributes of plant species present in the researched territory. The database includes biological properties (type of reproduction, pollination, seed dissemination type, flowering period, biological form); ecological characteristics (species response to light, temperature, soil moisture and reaction, mineral nitrogen content). The statistical analysis of the database revealed that the species are generally common at national level, are characteristic of well-established, high species diversity meadows, have a short life cycle generally characteristic of species present in high mountains (with short vegetation season due to late melting of snow, strong wind, etc.) and diverse responses to the action of environmental factors.

PHENOLOGICAL ANOMALIES REGARDING THE FLOWERING OF SPONTANEOUS, SUBSPONTANEOUS AND CULTIVATED PLANTS IN THE BIHOR COUNTY (ROMANIA) DURING APRIL 1, 2023-AUGUST 1, 2024

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Keywords: spontaneous, flowering, phenological anomalies, Bihor county.

The paper presents observations about the phenological anomalies regarding the flowering of spontaneous, subspontaneous and cultivated plants in the Bihor county (Romania) during the period April 1, 2023 - August 1, 2024. These anomalies are consequences of global warming, being observed in 39 species belonging to 21 botanical families. Premature flowering, flowering extension and supplementary flowerings were observed. Most phenological anomalies were observed in the following botanical families: Asteraceae (11 species), Scrophulariaceae, Brassicaceae, Fabaceae (3 species), Ranunculaceae, Rosaceae (2 species). Two species: *Wisteria sinensis* Sims and *Rudbeckia triloba* L presented two phenological anomalies regarding flowering.

GREEN SOLUTIONS FOR SUSTAINABLE CITIES

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Keywords: sustainable urban development, smart city, green solutions, vision, management.

This article explores various types of visions and perspectives guiding sustainable urban development, offering innovative and efficient solutions for creating viable long-term cities. Thus, ecological urbanism integrates ecological principles into urban design to create resilient, sustainable, and nature-harmonious environments. This vision is based on the harmonious coexistence between the natural and built environments. The approach focuses on minimizing environmental impact, promoting biodiversity, and creating green infrastructure. Examples include urban parks, green roofs, vertical gardens, and ecological corridors, all contributing to the conservation of natural resources and the improvement of urban quality of life. The smart city approach utilizes technology and data to improve the efficiency of urban systems and the quality of life for residents. This vision involves advanced connectivity and the use of data for informed decision-making. The smart city emphasizes connectivity, data-driven decision-making, and innovation in urban services. Relevant examples include smart grids, intelligent transportation systems, and waste management through IoT, which optimize resource consumption and ensure efficient city management. The compact city model promotes dense, mixed-use urban development to reduce urban sprawl and improve accessibility. This vision encourages urban densification and efficient space use. It focuses on reducing the need for car travel, increasing public transportation use, and creating vibrant, walkable communities. Examples include high-density housing, mixed-use developments,

and transit-oriented development (TOD), contributing to a more efficient and sustainable urban lifestyle. The resilient city framework involves building cities that can withstand and recover from various shocks and stresses, such as natural disasters and climate change. This vision prioritizes sustainability and adaptability. It emphasizes adaptive infrastructure, community preparedness, and sustainable resource management. Examples include flood defence, emergency response systems, and climate adaptation plans, ensuring cities' capacity to face challenges and recover quickly. The circular city concept is based on creating closed-loop systems in urban areas where waste is minimized, and resources are reused and recycled. This vision promotes sustainability through resource efficiency. It focuses on sustainable production and consumption, resource efficiency, and waste-to-energy initiatives. Relevant examples are urban farms, recycling programs, and circular economy centres, which reduce environmental impact by reusing materials and transforming waste into useful resources. Inclusive urban development ensures that the benefits of urban development reach all residents, especially marginalized and vulnerable groups. This vision promotes social equity, affordable housing, and access to essential services for all. Inclusive cities provide equal opportunities and a fair living environment. Examples include affordable housing projects, inclusive public spaces, and community-based planning processes, all contributing to creating a more equitable and inclusive urban environment. The presented typologies reflect various approaches to sustainable urban development. Each vision and perspective contributes valuable inputs to transforming our cities into sustainable, resilient, and inclusive environments. Combining these approaches can create cities that do not only develop but also thrive, ensuring the residents' well-being and protecting the environment.

POSTER PRESENTATIONS
VEGETAL BIOLOGY

THE INFLUENCE OF PESTICIDES AND BIOPESTICIDES ON SWEET POTATO FUSARIUM MOLD

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Keywords: biocontrol, *Fusarium*, low pesticide dose, sweet potato.

Growing sweet potato on the sandy soils of southern Oltenia has become a current practice. Unfortunately, this increased the incidence of phytosanitary problems. Among the phytopathogenic infection, fusariosis is the most common disease. The attack symptoms include basal leaf yellowing, plants wilt, root and crown rot and tubers dry rot. In the present study, *Fusarium equiseti* was found responsible for sweet potato tuber rot on stored KSP1 variety. This fungal pathogen is known to have a broad spectrum of infection; therefore, it could be transmitted among cereals and vegetable plants. The aim of this study was to evaluate several plant protection products for their antifungal activity against this fungal pathogen. Three commercial pesticides (CP) and one biocontrol measure were tested *in vitro* against *F. equiseti*. As biocontrol, the tested bacterial strain *Bacillus amyloliquefaciens* BW revealed 67.5 ± 0.8 % inhibitory efficacy against mycelial growth. The synthetic pesticides were tested, in two doses (usual and reduced). Best results for inhibiting fungal growth were obtained when using CP2-F pesticide, based on triadimenol 43 g/L, spiroxamine 250 g/L and tebuconazole 167 g/L. Both usual (0.07%) and reduced doses (0.05%) revealed a fungal inhibitory efficacy of 86.67 ± 0.88%, and 82.50 ± 0.88% respectively. Moreover, CP1-NP pesticide, based on trifloxystrobin 150 g/L and prothioconazole 175 g/L, was less effective against *F. equiseti* compared to the BW biological treatment.

ANIMAL BIOLOGY: INVERTEBRATES

THE HETEROPTERA SPECIES (HEMIPTERA, HETEROPTERA) PRESERVED IN THE ENTOMOLOGICAL COLLECTION IN THE MUSEUM OF INSTITUTE OF ZOOLOGY, STATE UNIVERSITY OF MOLDOVA

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Keywords: entomological collections, Institute of Zoology, State University of Moldova.

6749 specimens of 760 species of heteroptera (696 terrestrial and 64 aquatic) and 338 genera (309 terrestrial and 29 aquatic), belonging to 34 families – 22 terrestrial and 12 aquatic –, are stored in the entomological collection of Museum from the Institute of Zoology, State University of Moldova.

CONTRIBUTIONS TO THE KNOWLEDGE OF DIURNAL BUTTERFLIES (LEPIDOPTERA: PAPILIONOIDEA) FROM THE ORHEI NATIONAL PARK

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Keywords: Lepidoptera, Papilionoidea, Republic of Moldova, diversity, rare species.

The paper presents the faunal diversity of diurnal butterflies (Lepidoptera: Papilionoidea) from the Orhei National Parc. As a result of the researches carried out, a total of 94 species of diurnal butterflies were identified in the Orhei National Park, belonging to 59 genera and 6 families: Nymphalidae (35 species), Pieridae (12), Papilionidae (4), Lycaenidae (29), Hesperiidae (13) and Riodinidae (1 species). The research was carried out in various localities of the Orhei National Park (Ivancea, Vatici, Trebujeni, Romanești, Țigănești, Peresecina, Butuceni, Bravicea and Selișteе) during the years 2012-2023. Of the 94 species reported in the reserve, 14 are protected at national and European level, 13 being included in the Red Book of the Republic of Moldova, 2015. The research demonstrates that the Orhei National Parc is an area of great importance for the conservation of biological diversity, and research in the reserve needs to be continued.

ANIMAL BIOLOGY: VERTEBRATES

STUDIES ON THE MORPHOLOGICAL AND MICROSCOPIC APPEARANCE OF THE HYDATID CYST (*Echinococcus granulosus*), THE LARVAL STAGE OF THE *Taenia echinococcus* cestode IN CATTLE AND PIGS IN THE DOLJ COUNTY

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Keywords: *Echinococcus granulosus*, *Taenia echinococcus*, hydatic cyst, cattle, pigs, Dolj.

Through a series of research and samples of parasitic organs from pig and cattle species normally slaughtered in 3 slaughterhouses in the Dolj County during 2018-2024, we identified the parasite *Echinococcus granulosus*, the larval form of the cestode *Taenia echinococcus*, which is one of the most dangerous parasites in both animals and humans. The presence of the larval form of the parasite in organs was evidenced through the macroscopic and microscopic examination of the organs in LSVSA Dolj and the confirmation of the *Echinococcus* species by Real Time PCR by IISPV Bucharest.

RESULTS REGARDING THE CLASSIFICATION OF THE MUSEUM ITEMS FROM THE ORNITHOLOGICAL COLLECTION OF THE OLTENIA MUSEUM (ROMANIA)

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Keywords: classification, museum items, ornithological collection, Oltenia Museum Craiova.

The classification of museum items is an important component of the scientific research of museum heritage. In its collections, the Section of Natural Sciences of the Oltenia Museum Craiova has many items of historical and documentary-scientific value. The classification of these items in the Fund and Thesaurus categories (N. C. H.) represents a significant part of the scientific activity of specialists certified as experts by the Ministry of Culture, which coordinates the activity of the museum institutions. In order to classify heritage items, two categories of classification criteria are taken into consideration: general (age, frequency, state of preservation) and specific (historical or documentary value, memorial value, authenticity, author, workshop or school, formal quality). These criteria were developed by the Ministry of Culture with the approval of the National Commission of Museums and Collections. A significant part of the classified items belongs to the ornithology collection (8 pieces in the Thesaurus category and 134 items in the Fund category) and another 50 items from this collection are in the classification process. The classified pieces, as well as those in the process of classification, mainly represent valuable species for the avifauna of Romania, which, in terms of conservation of natural ecosystems, are rare species or species experiencing population decline or vulnerable to the pressure of anthropogenic factors. At the same time, some of these species are included in the Red Book of Vertebrates from Romania. From a taxonomic point of view, the ornithological items under discussion are represented by 94 species, respectively 74 genera from 37 families and 16 orders.

ECOLOGY
ENVIRONMENT PROTECTION

A BRIEF REVIEW OF METHODS OF COLLECTING AND EXAMINING WATER BIRD NESTS

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Keywords: aquatic birds, methods, nest, collecting methods, identifying nest.

Aquatic birds, especially migratory birds, are considered bioindicators of the state of the environment. The nest is a structure that has two functions: increases the probability of bird survival by protecting both young and parents, mainly during the reproductive season, and also functioning as a refuge during the non-reproductive season. Therefore, collecting and examining their nests provides and allows for the collection of life history data (e.g., clutch size, numbers of broods, numbers of nesting attempts, nesting success), which can give important insight into the vulnerability of species or perturbations. The objective of the current paper is to summarize the available literature on the collecting, monitoring and examination of nests. Analysis of the literature was done by querying the database of ISI quoted articles, Web of Science Core Collection, using specific keywords.

THE FLORA AND VEGETATION OF THE CAPRA GLACIER CIRQUE OF THE FĂGĂRAȘ MASSIF

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Keywords: Capra glacier cirque, Făgăraş Mountains, vegetal associations, floristic summary.

The Capra glacier cirque is located in the Southern Carpathians, on the southern slope of the Făgăraș Massif, in its central portion. The Capra glacier cirque was formed during the Quaternary glaciation and is located at an altitude of 2.230 m. The lake occupies an area of 1.8 ha, has an almost round shape and its maximum depth is 10-11 m. The relevant literature includes no data regarding the flora and vegetation of this glacier cirque. In the paper, we provide a floristic summary, having identified 142 taxa (cormophyte) and 18 vegetal associations (phytocoenoses). We also show that the phytocoenoses from the Capra glacier cirque have an arctic-alpine nature, being mostly acidophilous, because crystalline schists are widely spread here. The climate is harsh, of an alpine type, with an average annual temperature below 0˚C, with abundant precipitations mostly in the form of snow (over 1.200 mm/year) and strong winds that blow mainly from the west and northwest.

THE EVOLUTION OF URBAN GREEN SPACES (UGS). CASE STUDY: SOUTH-WEST OLTENIA REGION

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Keywords: urban green spaces, region, surface, population, Urban Green Space Index.

Urban green spaces are a necessity in the innovative-sustainable and modern development of municipalities/cities, as they must ensure the reduction of the negative effects of climate change and atmospheric pollution on the environment, but at the same time, the supply of ecosystem services for resident urban communities must be ensured. The urban green space information of the Oltenia Region from 1960 and 2020 was used as basic statistical data for the study. The spatiotemporal characteristics of UGS changes in urban localities in the SW Oltenia region were analysed using the urban green space index; at the same time, the areas of green space (ha) were compared, in order to capture the evolution of UGS in the five counties of the region.