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SINCE 2009 ZOOLOGYCON 2024

AN INTERNATIONAL ZOOLOGICAL CONGRESS ORGANIZED BY THE "GRIGORE ANTIPA" MUSEUM

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6 – 9 November 2024
BUCHAREST, ROMANIA

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AN INTERNATIONAL ZOOLOGICAL CONGRESS ORGANIZED BY THE "GRIGORE ANTIPA" MUSEUM

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ZOOLOGYCON 2024
6 – 9 November 2024
BUCHAREST, ROMANIA

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Systematics and Taxonomy

Ecology and Biodiversity Conservation

Valorization of Zoological Collections

Citizen Science

ZOOLOGYCON 2024 PROGRAMME

WEDNESDAY, THE 6th OF NOVEMBER 2024

09:00-12:00
Registration

09:30-09:40
Luis Ovidiu POPA - Welcome and Greetings on behalf of the "Grigore Antipa" National Museum of Natural History

09:40-09:50
Dumitru MURARIU - Welcome and Greetings on behalf of the Romanian Academy

09:50-10:00
Mariana-Carmen CHIFIRIUC - Welcome and Greetings on behalf of the University of Bucharest

Famous Romanian zoologists

10:00-10:45
Luis Ovidiu POPA, Costică ADAM, Oana Paula POPA, Maxim-Jean BÂLCU, Modest GUȚU - Mihai Băcescu (March 28, 1908 - August 6, 1999)

10:45-11:15
Coffee break

Invited speaker

11:15-12:00
Nesrine AKKARI - Taxonomy - from an endangered discipline towards an integrative future, with emphasis on the role of natural history collections

Paleozoology

Chair: Vlad A. CODREA (Cluj-Napoca, Romania)

12:00-12:15
Vlad A. CODREA, Márton VENCZEL, Alexandru A. SOLOMON, Cristina FĂRCAȘ, Marian BORDEIANU, Ionuț GRĂDIANU, László VERESS, Vlad STOICESCU - The Eocene-Oligocene boundary in Romania: main terrestrial vertebrate localities

12:15-12:30
Kenneth A. MONSCH, Ionuț GRĂDIANU, Dorin-Sorin BACIU - Preliminary results of systematic revision of scombriform and istiophoriform fishes from the Oligocene of Piatra-Neamț (Romania)

Faunistics and Zoogeography I

Chair: Victor SURUGIU (Iași, Romania)

12:30-12:45
Tony-Alexandra TICU, Daria Mihaela ALEXA, Teodora COZMA, Georgiana DIACONU, Matei-Florin FLOREA, Ovidiu-Andrei GEORGESCU, Ionuț-Alexandru IORGA, Ada MUTLUSOY, Rebeca-Alexandra PASCAL, Adina-Camelia POPOVICI, Marina-Raluca SEVERIN, Lucian FUSU - Geographical distribution of the genus *Helix* (Gastropoda, Helicidae) in Romania

12:45-13:00
Victor SURUGIU, Andrei-Sasha SCOTNIȚCHI, Oana Paula POPA - Revealing the identity of leeches of the genus *Limnatis* (Annelida: Hirudinea: Praobdellidae) from Romania

13:00-14:00
Lunch Break

Invited speaker

14:00-14:45
Daniel R. GUSTAFSSON – The present and future of chewing louse diversity

Faunistics and Zoogeography II

Chair: Victor SURUGIU (Iași, Romania)

14:45-15:00
Ștefan Cătălin BABA, Andrei GIURGINCA, Rodica PLĂIAȘU, Robert OPRAN, Andreea MÎRLENEANU, Octavian PACIOGLU - The curious case of the peregrine centipede (Chilopoda, Lithobiomorpha, Lithobiidae) in Romania

15:00-15:15
Angelica CURLIȘCĂ - Qualitative observations regarding the presence of some arthropod species in the period 2021-2024 in the green space within the Constanța Complex Museum of Natural Sciences

15:15-15:30
Galina BUȘMACHIU, Oxana MUNJIU - Odonata (Insecta) from the Prut River Basin, Republic of Moldova

15:30-15:45
Rusudani TSIKLAURI, Nana BAKHTADZE, Levan MUMLADZE - Diversity of Jewel Beetles (Coleoptera, Buprestidae) of Georgia

15:45 – 16:00
Eugen NITZU, Rodica PLĂIAȘU, Ștefan Cătălin BABA, Robert OPRAN - Beetles (Insecta, Coleoptera) from the anthropic subterranean habitats and adjacent caves in Southern Carpathians: preliminary results

16:00-16:15
Irinel Eugen POPESCU, Irina Neta GOSTIN - Second record of *Megastigmus irinae* Popescu, 2023 (Chalcidoidea, Megastigmidae) in the Maldives Archipelago, from Nalaguraidhoo (Alif Dhaal Atoll) Island

16:15-16:30
Irina Neta GOSTIN, Irinel Eugen POPESCU - Morphology and histocytology of *Lasioptera rubi* Galls from *Rubus idaeus*

16:30 – 16:45
Ovidiu-Andrei GEORGESCU, Alexandru-Mihai PINTILIOAIE, Lucian FUSU, Viorel IONESI - Fossil and current ant species from Blănarului Hill (Vlădiceni, Iași County, Romania)

16:45-17:00
Sérgio P. ÁVILA, António Múrias dos SANTOS, Carlos S. MELO, João M. PORTEIRO, António M. MEDEIROS, Lara BAPTISTA, Adriano PIMENTEL, Patrícia MADEIRA, Cristina A. REBELO, Ana HIPÓLITO, Sofie E. VOERMAN, Mónica MOURA, Björn BERNING, Kenneth F. RIJSDIJK, Esther MARTÍN-GONZÁLEZ, Rui QUARTAU, Ricardo S. RAMALHO, Markes E. JOHNSON - Extending the Sea-Level Sensitive dynamic model of marine island biogeography to include fusion-fission islands

Systematics and Taxonomy

Chair: Vlad-Eugen DINCĂ (Bucharest, Romania)

17:00-17:15
Adrian RUICĂNESCU, Maximilian TEODORESCU, Cristian SITAR, Lucian BARBU-TUDORAN - Redescription of the last instar larva of *Eurythyrea aurata* (Pallas, 1776) using microphotography and SEM techniques

17:15-17:30
Derya ÇETİNTÜRK - Genetic analyses of the Anatolian populations with different total number of chromosomal arms (NF) of Turkish Hamster (*Mesocricetus brandti* Nehring, 1898)

17:30-18:30
Coffee, Tea and Posters

19:00-20:00
Official Opening of the Exhibition "The Dream of the First Polar Night - Belgica - Antarctic Expedition 1897-1899" - at the "Grigore Antipa" National Museum of Natural History

THURSDAY, THE 7th OF NOVEMBER 2024

09:00-10:00
Registration

Invited speaker

10:00-10:45
Jean-François FLOT - What are species and how to delineate them – a fresh new look at a long-standing issue

10:45-11:15
Coffee break

Evolution, Phylogeny, Phylogeography I

Chair: Jean-François FLOT (Brussels, Belgium)

11:15-11:30
Alexandra A. GROSSI, Daniel R. GUSTAFSSON - Symbionts with symbionts: endosymbiotic bacteria of parasitic chewing lice

11:30-11:45
Octavian PACIOGLU, Daniela FLOREA, Corina IȚCUȘ, Iris M. TUȘA - Hypogean versus epigean ecotypes of *Gammarus balcanicus* in Apuseni Mountains (Romania)

11:45-12:00
Alice SALUSSOLIA, Fabio STOCH, Jean-François FLOT - First steps in reconstructing the phylogeny and evolutionary history of Alpine groundwater *Niphargus* (Crustacea, Amphipoda)

12:00-12:15
Florina-Georgiana CABA, Maria-Magdalena DASCĂLU - The analysis of a hybrid between *Dorcadion lugubre minkovae* Heyrovský and *D. lineatocolle* Kraatz (Cerambycidae, Lamiinae) — a singular occurrence or a recurring event?

12:15-12:30
Andrei ȘTEFAN, Mohammed M. TAWFEEQ, Oana Paula POPA, Luis Ovidiu POPA, Fabio STOCH, Steven L. KEFFER, Serban M. SARBU, Jean-François FLOT - Water scorpions of the Holarctic (*Nepa* spp., Insecta: Hemiptera): genetic diversity and phylogeography

12:30-12:45
Mohammed M. TAWFEEQ, Andrei ȘTEFAN, Meredith PROTAS, Serban M. SARBU, Jean-François FLOT - Intra and interspecific genome size variations in arthropods

12:45-13:00
Stephen BERGACKER, Marc KOCHZIUS, Jean-François FLOT - The phylogeography of pelagic eagle rays (Aetobatidae), genetic patterns and coastal ecosystem dependencies

13:00-14:00
Lunch Break

Invited speaker

14:00-14:45
László RÁKOSY - Expansion, regression and phenological shifts in butterfly species in Romania

Sponsor

14:45-15:15
Sorin BOGDAN - Equipment and solutions for water and environment monitoring

Evolution, Phylogeny, Phylogeography II

Chair: Jean-François FLOT (Brussels, Belgium)

15:15-15:30
Alona YURCHENKO, Tomas PSENICKA, Pablo MORA, Alberto MARSHAL ORTEGA, Antonio SANCHEZ BACA, Michail ROVATSOS - Cytogenetic analysis of satellite content of five species of arvicolid rodents (Arvicolinae, Rodentia)

15:30-15:45
Algimantas PAULAUSKAS - Hybridization between native red deer (*Cervus elaphus*) and introduced sika deer (*Cervus nippon*) and impacts to red deer populations

15:45-16:00
Mohammad Sadegh ALAVI-YEGANEH, Mohammad Reza SHARIATI, Ramin VALI-ESKANDANI, Erdoğan ÇIÇEK - Phylogenetic evidences indicating more close relationship between the Caspian Sea and the Black Sea fish fauna, lessons from Clupeidae and Atherinidae

Ecology and Biodiversity Conservation I

Chair: Geta RÎȘNOVEANU (Bucharest, Romania)

16:00-16:15
Geta RÎȘNOVEANU, Mihaela SAVA, Cristina-Maria POPESCU, Darmina NIȚĂ, Mihaela OPRINA-PAVELESCU, Constantin CAZACU, Valentin DINU - The role of riparian vegetation in structuring aquatic benthic invertebrate communities

16:15-16:30
Marilena ONETE, Roxana-Georgiana NICOARĂ, Luiza-Silvia MIHAI, Minodora MANU - The role of management and environmental variables on soil invertebrates' connection with plant species in some grasslands from Făgăraș Massif

16:30-16:45
Cristina FIERA, Minodora MANU, Ioana VICOL, Monica MITOI, Tiberiu C. SAHLEAN, Diana Elena VADANA, SOB4ES consortium - Soil biodiversity structure in response to land use types and intensity from Pannonian region of Romania

16:45-17:00
Minodora MANU, Raluca Ioana BĂNCILĂ, Roxana-Georgiana NICOARĂ, Luiza-Silvia MIHAI, Marilena ONETE - Edaphic mites (Acari, Mesostigmata) – microscopic bioindicators of some praticolous ecosystems from Romania

17:00-18:00
Coffee, Tea and Posters

FRIDAY, THE 8th OF NOVEMBER 2024

09:00-10:00
Registration

Invited speaker

10:00-10:45
Vlad-Eugen DINCĂ - Rediscovering European butterflies: from DNA barcoding to genomics

10:45-11:15
Coffee break

Valorization of Zoological Collections

Chair: Luis Ovidiu POPA (Bucharest, Romania)

11:15-11:30
Ioana Cristina CONSTANTINESCU, Rozalia Magda MOTOC, Gabriel Bogdan CHIȘAMERA, Costică ADAM - Feather mite collection (Acarina, Analgoidea) of "Grigore Antipa" National Museum of Natural History

Ecology and Biodiversity Conservation II

Chair: Vlad-Eugen DINCĂ (Bucharest, Romania)

11:30-11:45
Marius SKOLKA, Rodica PLĂIAȘU, Raluca Ioana BĂNCILĂ, Constantin CIUBUC, Oliviu Grigore POP, Ștefan Cătălin BABA - The structure of the invertebrate fauna in forest and alpine habitats included in ecological reconstruction programs in the Făgăraș Mountains area (Romania)

11:45-12:00
Marius SKOLKA, Rodica PLĂIAȘU, Raluca Ioana BĂNCILĂ, Constantin CIUBUC, Daniyar MEMEDEMIN, Ovidiu DRĂGAN, Dan COGĂLNICEANU - The invertebrate fauna of the epigean layer from different types of habitats in the Retezat National Park (Romania)

12:00-12:15
Simona MIHĂILESCU, Florentina Iuliana GHEORGHE, Minodora MANU, Marilena ONETE - Protecting Romanian biodiversity: national and international legal frameworks

12:15-12:30
Valentin DINU, Cristina-Maria POPESCU, Darmina NIȚĂ, Cezara TUDOSE, Ioana ENACHE, Geta RÎȘNOVEANU - The influence of multiple stressors on shredding behavior of macroinvertebrates in stream ecosystems: the role of species richness

12:30-12:45
Ioana ENACHE, Cristina-Maria POPESCU, Mihaela SAVA, Darmina NIȚĂ, Constantin CAZACU, Silvia BORLEA, Marius NISTORESCU, Geta RÎȘNOVEANU - Benthic insect (Ephemeroptera, Plecoptera, Trichoptera, Coleoptera) larvae diversity from South and South-Western Romanian Mountain streams

12:45-13:00
Lucian HĂNCEANU, Maria-Magdalena DASCĂLU, Lucian FUSU - Updating the distribution of *Osmoderma barnabita* in Romania, with new locality records for the northeastern part of the country

13:00-14:00
Lunch Break

Invited speakers

14:00-14:45
Manuel ORTIZ-TOUZET, Ignacio WINFIELD, Sergio CHÁZARO-OLVERA - An overview on the taxonomy of the benthic marine amphipod (Crustacea, Peracarida) from the Gulf of Mexico and the Caribbean Sea

14:45-15:15
Laurenția UNGUREANU, Victoria NISTREANU, Galina BUȘMACHIU, Dumitru BULAT, Ion TODERAȘ - Actual status and limiting factors of rare animal species in the Republic of Moldova

Ecology and Biodiversity Conservation III

Chair: Geta RÎȘNOVEANU (Bucharest, Romania)

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Marian D. MIREA, Silviu CHIRIAC, Steluța MANOLACHE, Iulia V. MIU, Lavinia PÎNDARU, Viorel D. POPESCU, Laurențiu ROZYLOWICZ - Movement ecology of Hermit beetles (*Osmoderma eremita*) in Eastern Romanian Carpathians

15:30-15:45
Iulia V. MIU Marian D. MIREA, Viorel D. POPESCU, Bekka S. BRODIE, Silviu CHIRIAC, Laurențiu ROZYLOWICZ - Priority conservation areas for protected saproxylic beetles in Romania under current and future climate scenarios

15:45-16:00
Ionuț-Marian DRAGOMIR, Dragoș TOMA, Flavius BĂLĂCENOIU, Gabriela ISAIA - Analysis of non-target beetle species collected on pheromone-baited adhesive panels in two oak stands infested with *Lymantria dispar* (Linnaeus, 1758) in southern Romania

16:00-16:15
András Attila NAGY, Nándor ERŐS, István IMECS, Gábor BÓNÉ, Attila FÜLÖP, Péter László PAP - Distribution and diversity of fishes and lampreys in Transylvanian river systems

16:15-16:30
Iulian GHERGHEL, Ryan Andrew MARTIN - Biotic interactions across time: conserved predator-prey dynamics shape species ranges

16:30-16:45
Ionuț C. PETREANU, Petronel SPASENI, Tiberiu C. SAHLEAN, Iulian GHERGHEL, Ștefan R. ZAMFIRESCU, Alexandru STRUGARIU - Thermal preferences of melanistic and patterned *Vipera* (*berus*) *nikolskii* under laboratory conditions

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Tiberiu C. SAHLEAN, Iulian GHERGHEL, Răzvan ZAHARIA, Viorel D. GAVRIL, Raluca MELENCIUC, Cătălin-Răzvan STANCIU, Alexandru STRUGARIU - Patterns of road mortality in the Caspian whip snake (*Dolichophis caspius* Gmelin, 1758) in Romania

17:00-17:15
Petronel SPASENI, Iulian GHERGHEL, Tiberiu C. SAHLEAN, Ștefan R. ZAMFIRESCU, Alexandru STRUGARIU - Spatial and environmental drivers of melanism in a widespread polymorphic snake species

17:15-17:30
Alexandru STRUGARIU, Petronel SPASENI, Iulian GHERGHEL, Ștefan R. ZAMFIRESCU, Tiberiu C. SAHLEAN - Same color, same choice? Habitat use and activity patterns in melanistic vs. patterned vipers from monomorphic and polymorphic populations

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Tihamér FÜLÖP, Szilárd SUGÁR, Csaba KISS, Gábor BÓNÉ - Assessment of the impact of natural and anthropogenic predators on ungulates in the Iron Gates Natural Park (Romania)

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Mihai I. POP, Simona R. GRĂDINARU, Viorel D. POPESCU, Silviu CHIRIAC, Agnes KERESZTESI, Cristian IOJĂ - How a national emergency looks like. The curious case of the Carpathian brown bears

18:00-18:30
Coffee, Tea and Posters

19:00-20:00
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20:00-20:30
Poster Awards

20:30-22:30
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INVITED SPEAKERS

Taxonomy - from an endangered discipline towards an integrative future, with emphasis on the role of natural history collections

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Key words: integrative approaches, multidisciplinarity, natural history museums.

The decline of biodiversity continues to impact humanity and represents a major concern, which renders exploring and understanding the systematic diversity of taxa of prime importance. A role mainly carried by taxonomists, who themselves have become an "endangered species". The core task of taxonomists is to discover, describe and name taxa, document their diversity, and understand their phylogenetic relationships. This constitutes the groundwork for any subsequent fundamental or applied research and procures profound insights into the evolution of taxa. Without taxonomy, species lists would not be provided, model species for medical research could be misidentified and important information for practitioners such as conservationists would be missing. Taxonomy continues however to face numerous challenges, such as the lack of prestige and resources, which undeniably cripples the progress of cataloguing the diversity. This is mostly due to a general depreciation of this discipline due to its "descriptive" nature, publication metrics that are not in favour of taxonomic works, lack of baseline funding for positions in taxonomy, and a shift of focus and priorities in natural history Museums. A major part of the taxonomic research relies on natural history collections, which contain a wealth of information portraying the diversity of nature and the evolution of our planet. Being the repositories of millions of preserved labelled specimens, including rapidly disappearing or even extinct species, the scientific collections are considered invaluable "archives for biodiversity". These collections are of prime importance to examine various aspects related, for example, to the systematics, morphology, and genetic variation across vast temporal and spatial scales allowing scientists to reconstruct and understand the evolution of taxa. Natural history museums are also unique spaces for interdisciplinary research and innovation, where novel methods are always applied to bridge the gap between science, art and humanities.

In this talk, I highlight the history and importance of taxonomy as an independent research, yet vital for all other disciplines, while I also present the possible reasons for its depreciation in the past decades. Based on examples from my own research, I prove taxonomy to be an active discipline when armed with multidisciplinary and integrative approaches, and relying on natural history collections, the scientific treasure trove for research and innovation. While not presenting tangible solutions, I underline a few initiatives and possible practices that could revive taxonomy in times we need it the most.

Rediscovering European butterflies: from DNA barcoding to genomics

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Key words: butterflies, DNA barcoding, Europe, genomics, model species.

Charismatic organisms often spearhead nature conservation efforts and sometimes act as model groups for research in various fields. This is the case for European butterflies, which represent one of the most intensively studied groups of insects and efficient ambassadors of invertebrate conservation. During the last two decades, continuous progress in DNA sequencing and analysis has unlocked new layers of knowledge in European butterflies, highlighting complex phylogeographic histories, unexpected levels of cryptic diversity or gene flow, and the importance of including genetic data in conservation programmes. A notable proportion of current genetic knowledge on European butterflies stems from the assembly of large DNA barcode reference libraries that allowed an unprecedented overview of mitochondrial DNA variability across the continent. This has, for example, eventually led to the inference of major phylogeographic patterns and the detection of a considerable fraction of potential cryptic species requiring further research. Thus, DNA barcodes often served as the starting point for new studies using additional sources of data. More recent and rapid advances in high-throughput DNA sequencing technology (HTS) and analysis are taking knowledge of European butterflies to a new level. The massive amounts of genomic data available through HTS offer valuable insights into the evolutionary history of butterflies, highlighting patterns of isolation or admixture, cases of mito-nuclear discordance, or evolutionary significant units of conservation value. These relatively new approaches are further boosted by ongoing efforts of generating high quality reference genomes for all European Lepidoptera. Such remarkable progress provides both unparalleled opportunities for research and new challenges towards better understanding and preserving global biodiversity.

What are species and how to delineate them – a fresh new look at a long-standing issue

Jean-François FLOT

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Key words: taxonomy, systematics, species boundaries, process philosophy, existentialism.

Around 2003, species delineation experienced a rebirth as a research topic (Sites & Marshall, 2003), developing from a cottage industry into a formal scientific practice resting onto three main types of approaches: distance-based, tree-based and allele sharing-based methods (Flot 2015; Dellicour & Flot, 2018). Crucially, each of these major paradigms is based on different hypotheses and expectations regarding the nature and properties of biological species, encompassing both philosophical and practical considerations.

In this presentation, I will draw from recent empirical and simulation studies in my group to describe the state of the art in species delimitation. Moreover, I will unveil a general workflow for molecular taxonomy applicable to any group of organisms.

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The present and future of chewing louse diversity

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Key words: Phthiraptera, biogeography, biodiversity, co-extinction, co-endangerment.

Chewing lice (Phthiraptera) are obligate parasites of birds and mammals, and lack free-living stages. This close connection to their hosts have led to a high degree of host specificity and co-speciation. Throughout the 20th century, this was inferred to mean that the phylogeny of lice should mirror that of their hosts, that each host species was parasitized by unique louse species, and that the geographic range of lice mirrored that of their host. Research over the last few decades has shown that these assumptions are not always valid. Co-speciation is often disrupted by host-switching, and host-switches have been frequent throughout the evolutionary history of the lice. Some lice are host specific, but others are host generalists that naturally occur on dozens of host species. In contrast, some louse species appear to be found only in part of the host's range, and the geographical range of a louse species is often determined by external factors, including humidity, altitude, and habitat size. In short, lice have a more complicated relationship with the world around them than previously thought. Understanding these relationships will be increasingly vital in coming years, as lice are often co-endangered with their hosts, and may face extinction more easily than the birds and mammals they parasitize. Moreover, as treatments for parasites are standard in many breeding or reintroduction programs, conservation-induced extinction, in which one or several organisms become extinct to save one (more charismatic) organism, may be common. Estimates of host specificity indicate that over 1100 species of lice may occur exclusively on endangered hosts; only ~100 of these are known today. In order to protect the over 1000 unknown species, it may be necessary to "pre-emptively redlist" these unknown species, to highlight the need for conservation workers to save the lice alongside their hosts.

An overview on the taxonomy of the benthic marine amphipod (Crustacea, Peracarida) from the Gulf of Mexico and the Caribbean Sea

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Key words: amphipods, Mexico, Caribbean Sea.

Amphipods are the most important peracarid crustaceans based on their abundance, biodiversity, and role in food webs worldwide. Up to now, nearly 10,500 species have been documented in different ecosystems and more than 100 are described each year. These macrocrustaceans occur as planktonic components, but primarily as benthic members in seas, rivers, lakes and, a few species in groundwater. Some are terrestrial and can inhabit beaches, greenhouses and mountain leaf litter. The present study includes not only a background, but also the general morphology and taxonomy of the main taxa of each suborder registered so far for the Gulf of Mexico and the Caribbean Sea. Suborder Amphilochidea: Ampeliscidae, Amphilochidae, Ampithoidae, Bateidae, Cyproideidae, Eusiridae, Haustoriidae, Leucothoidae, Lysianassidae Aristiidae, Lysianassidae Miramarassidae, Oedicerotidae, Platyischnopidae, Sebidae, Stenothoidae. Suborder Colomastigidea: Colomastigidae, and Suborder Senticaudata: Aoridae, Caprellidae, Cheluridae, Corophiidae, Ischyroceridae, Gammaridae, Maeridae, Megaluropidae, Melitidae, Nuuanuidae, Phlianthidae, Podoceridae. As a result of different oceanographic cruises, an increase in the description of new deep-sea amphipods in the region has been recorded.

Famous Romanian zoologists: Mihai Băcescu (March 28, 1908 - August 6, 1999)

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Key words: mentor, explorer, systematic zoology, taxonomist, museologist, ethnozoology.

This year marks 25 years since the passing of Mihai Băcescu, the esteemed Romanian scientist who served as the director of the "Grigore Antipa" National Museum of Natural History for nearly 25 years, from February 15, 1964, to October 31, 1988.

Academician Mihai Băcescu was a prominent figure in Romanian zoology in the 20th century and gained international recognition for his contributions to systematics, oceanology, museology, and ethnozoology. Born in 1908, the same year the current "Grigore Antipa" Museum building opened to the public, he was a worthy successor to Grigore Antipa's legacy. During his more than fifty years at the museum, Mihai Băcescu brought significant acclaim to the institution, primarily through his ongoing support for and development of scientific research. He was also an exceptional mentor to many aspiring zoologists and oceanologists, guiding them to become highly skilled specialists. Representing Romania with pride, he attended numerous international scientific meetings.

Driven by a passion for discovery, Mihai Băcescu was a true explorer, taking part in numerous oceanic expeditions throughout his career. He enriched the museum's collection with invaluable biological specimens, leading to the identification and description of many new taxa, including species, genera, tribes, and families. While his interests were wide-ranging—covering marine biology, limnology, ecology, ethnozoology, and museology—his greatest passion was systematic zoology, particularly carcinology. His remarkable contributions in this area established him as one of the world's foremost taxonomists. Altogether, he discovered and described 281 new species and subspecies, along with 60 new families, tribes, genera, and subgenera of crustaceans. In addition, he explored the systematics of other animal groups, identifying two new species of mud dragons (Kinorhyncha), one new species of nematode, one sea spider (Pycnogonida), three subgenera, and six species of fish. In total, he contributed to the discovery and description of 354 new taxa, most of which are preserved in the museum's collections.

Mihai Băcescu was also a devoted museologist who made substantial contributions to Romanian museography. From the fall of 1940 until nearly the end of his life, he played a pivotal role at the Natural History Museum in Bucharest, where he was actively involved in restoring the museum building and its permanent exhibits after major challenges, including earthquakes and bombings. In 1964, he

contributed to the founding of *Revista Muzeelor* (Romanian Journal of Museums), which continues to be published today. Under his leadership, the Natural Sciences Museum in Fălticeni was established between 1980 and 1982, later officially named the "Mihai Băcescu" Waters Museum in 1993.

Băcescu also made pioneering contributions to ethnozoology, publishing several important studies in this field, including two landmark works: *Peştii aşa cum îi vede ţăranul pescar român* (Fishes as Seen by the Romanian Peasant Fisherman) (1947) and *Păsările în nomenclatura şi viaţa poporului român* (Birds in the Nomenclature and Life of the Romanian People) (1961).

Throughout his distinguished career, he received numerous awards and honors. Perhaps the most meaningful recognition of his legacy is the more than 80 species and genera named in his honor by specialists around the world. This reflects, more than anything, how Mihai Băcescu's contributions and personality are perceived by zoologists everywhere.

Expansion, regression and phenological shifts in butterfly species in Romania

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Key words: butterflies, expansion, regression, Romania

Species expansion and regression from regional to global levels has been a very topical issue for the last 30 years, while the phenological changes were much less considered and analyzed. The reliability of the results is very much dependent on the quality of the data, the spatial scales and time periods considered. Large spatial scales and long time periods are preferred, but they are rarely accessible. In countries with many volunteers interested in the monitoring of butterflies, the data and their interpretation are very good. In other countries with few or very few volunteers, the data are modest and the situation of expansive or regressive species is rather unknown. In such cases, there are only two options: i. not to tackle the issue and ignore it; ii. to compile and interpret the historical and current data as well and as accurately as possible.

Romania is in this state. There is a lack of freelance or professionally collected butterfly data. There is no large database that contains all the available data.

In order to be able to make a statement on the topic of expansive and regressive butterfly species in Romania, we have collected and interpreted all available data from publications, museum and private collections, as well as numerous data from amateur and professional lepidopterists for the 1930-2023 period.

For phenological changes, we selected the earliest and the latest flying butterfly species in the year and statistically analyzed the flight data from 1970 to 2023. The results show a clear shift in the flight period for spring species towards February, while the flight period for autumn species has shifted towards November.

Of the 210 butterfly species recorded from Romania, examples of declining and expanding species were selected for the 1930-2023 period and presented graphically. To explain these fluctuations, the influences of climate change, modifications in human land use practices and species-specific ecological characteristics are discussed. A tabular overview of all species occurring in Romania with the categories *stable*, *expanding*, *declining* and *unknown* rounds off the presentation. Causes of regression and expansion of butterfly species as well as deficits in research are discussed.

Actual status and limiting factors of rare animal species in the Republic of Moldova

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Key words: fauna, rare species, status, Red List, protection, limiting factors, Republic of Moldova.

In the last decades the fauna species suffered changes in their status at global level, as well as at regional level. In the Republic of Moldova the problem of fauna protection has been approached since the 1970's of the past century. In 1978 the first edition of the Red Book of Moldavian RSS was published that included only 29 terrestrial vertebrate species: 8 mammal, 17 bird and 4 reptile species. The second edition of the Red Book of the Republic of Moldova was published in 2001 and 116 animal species were listed: 14 mammal, 39 bird, 8 reptile, 1 amphibian, 12 fish and one cyclostomata species, as well as 41 invertebrate species: 37 insect, 3 mollusk and 1 crustacean species. In the third edition of the Red Book of the Republic of Moldova, published in 2015, 219 animal species were described: 134 vertebrate species (30 mammals, 62 birds, 9 amphibians, 9 reptiles, 23 fish and one cyclostomata species) and 85 invertebrate species (80 insect, 3 mollusk, one crustacean and one collembolan species).

At present, there are 3 categories of limiting factors: biological, climatic and anthropogenic. The biological factors include the increasing of some predator species, of invasive species, decreasing of prey species number that serve as food resources for predatory and insectivorous species, hybridization, interspecific competition. The climate change from the last decades leads to ecosystem aridization, lower amount of precipitation, high winter temperatures, decreasing of water level in rivers and aquatic basins. The highest negative impact is provoked by anthropogenic activities: diminishing of natural ecosystem area, deforestation, draining, construction of dams, soil and water pollution, extensive agriculture, excessive use of pesticides, intensive grazing, disturbing the hibernation and breeding habitats, lack of ecological education, unorganized tourism, hostile attitude towards some animals, poaching, vegetation burning etc.

In the years 2024-2025, the current state of animal species on the territory of the country will be evaluated, and in 2026, the fourth edition of the Red Book of the Republic of Moldova is expected to be published.

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ORAL PRESENTATIONS

The Eocene-Oligocene boundary in Romania: main terrestrial vertebrate localities

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Key words: Grande Coupure, terrestrial formations, vertebrate faunas, Transylvania, Romania.

Throughout Eurasia the Eocene-Oligocene boundary is a marker of highly relevant terrestrial bio-events of widespread interest, initially named Grande Coupure. Around this boundary, the faunas and floras (Wu et al., 2024) underwent rejuvenation under the influence of climatic changes, with paleogeographic consequences. The fluctuations in the level of the Earth's oceans have been essential, and have led to the opening of continental pathways for the terrestrial faunas, mainly vertebrates of various sizes.

In Romania, the terrestrial events are recorded in the Transylvanian sedimentary basin, mainly on its north-western side, in Gilău, Meseş and possibly, Preluca sedimentary areas. The vertebrate Eocene localities Rădaia, Cluj-Napoca – Mănăştur and Someş-Dig, Bociu, Treznea, Morlaca, as well the Oligocene ones as Cluj-Napoca – Cetăţuie and Suceag document the terrestrial bio-events at the above mentioned boundary. Of particular interest is Morlaca, where remains of large-sized mammals such as brontotheres, amynodontidae and anthracotheres have been found (Tissier et al., 2018 and unpublished data). These are representatives of Asian origin, which reached Europe following the southern path, across Anatolia and the Balkans.

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Preliminary results of systematic revision of scombriform and istiophoriform fishes from the Oligocene of Piatra-Neamț (Romania)

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Key words: Oligocene, Romania, Scombriformes, Istiophoriformes, systematic revision.

Romanian Oligocene fish fossils are known from the 19th century, when professor Leon Cosmovici (1887) first mentioned them. Their research continues presently (see Baciu *et al*. 2016). Most specimens were discovered in Bituminous marls and Lower Dysodilic shales of Early Oligocene from External Flysch deposits of the Eastern Carpathians (Piatra-Neamţ, Gura Humorului, Homorâciu, Suslăneşti, Vrancea areas), and are deposited in Natural Sciences Museum, Piatra-Neamţ, Department of Geology, "A. I. Cuza" University, Iaşi, National Museum of Geology, Bucharest, University of Bucharest, and Babeş-Bolyai University, Cluj-Napoca. Recent excavations yielded many new specimens. Here, we focus on Scombriformes (mackerel-likes) and †Palaeorhynchidae (Istiophoriformes), two well-represented groups in the Oligocene ichthyofauna. Traditionally, Istiophoriformes were in suborder Scombroidei (now order Scombriformes, cf. Nelson *et al*. 2016), until molecular phylogenetics identified separate lineages (Orrell *et al*. 2006). Because known descriptions are made with poorly preserved material, many records need revision, as to provide solid phylogenetic, palaeoecological and palaeogeographical information. Their taxonomy is outdated, considering recent advances in systematics (see also Monsch and Bannikov 2012, Monsch and Micklich 2018, Nelson *et al*. 2016). Preliminary results show the following. 1)The only istiophoriform species are †*Homorhynchus colei* (Agassiz, 1844), previously considered †*Palaeorhynchus longirostris* Agassiz, 1843 and *Palaeorhynchus humorensis* Brustur and Grigorescu, 1973. 2)Within Scombriformes, one species of family Trichiuridae is identified with certainty: †*Anenchelum glarisianum* Blainville, 1818. Some specimens could not be certainly identified as *glarisianum*, while others belong to genus *Lepidopus*. 3)We confirm the presence of †*Thunnus albui* Simionescu, 1905. However, we are considering transferring the species to genus *Sarda*. Similarly, we consider if †*Thunnus abchasicus* Daniltshenko, 1951 is the same as †"*Thunnus*" *albui*. 4)We also consider transferring †*Gymnosarda dysodilica* Ciobanu, 1977 to *Sarda*. 5)We confirm the presence of mackerels †*Scomber voitestii Paucă,* 1929 and †*Auxides cernegurae* (Ciobanu, 1970). †*S. voitestii* specimens were previously identified as †*Scomber saadi*. 6)We confirm the presence of †*Palimphyes chadumicus* Daniltshenko, 1960 and the gempylid †*Thyrsitoides zarathoustrae* Arambourg,

1967. We discuss the significance of these preliminary findings for geological knowledge.

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Geographical distribution of the genus *Helix* (Gastropoda, Helicidae) in Romania

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Key words: Roman snail, Turkish snail, distribution maps, update.

This study updates and analyses the geographical distribution of the species from the genus *Helix* (Gastropoda, Helicidae) in Romania based on field data from eastern Romania collected from 2020 to 2024 as well as published articles and data from the citizen science platform iNaturalist. Due to their ecological and economic importance, as well as the impact of climate change and human interventions on their natural habitat, *Helix* snail species have been the subject of extensive studies. *Helix pomatia* is included in annex V of the Habitats Directive of the EC and its commercial exploitation must be subject to management measures. Our results show that *Helix lucorum* (Turkish snail) is much more common in anthropic habitats from eastern Romania than *Helix pomatia* (Roman snail). *Helix lutescens* and *Helix thessalica* (Thessalian snail) are the other two species present in Romania, but are found in a smaller number of localities. An analysis of the published data compared to our findings suggests that *Helix lucorum* is allochthonous in most parts of Romania, except perhaps in Dobrogea where it is likely native. An illustrated key including the above mentioned species is provided. The illustrations are based on specimens collected in Romania and cover most of the colour and shape variability of each species.

Revealing the identity of leeches of the genus *Limnatis* (Annelida: Hirudinea: Praobdellidae) from Romania

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Key words: *Limnatis nilotica*, *Limnatis paluda*, *Limnatis bacescui* morphology, mitochondrial marker, molecular confirmation.

The genus *Limnatis* Moquin-Tandon, 1827 comprises hematophagous (bloodsucking) leeches that feed on mammals, including humans and domestic animals. Because the teeth on their jaws are blunt, they are unable to pierce the skin. Therefore, they feed by attaching themselves to the internal mucous membranes (pharynx, nasopharynx, oesophagus, larynx, trachea, bronchial tubes and female genital organs), causing prolonged bleeding in infested animals. From the taxonomic point of view, there were reported at least 16 closely resembling species within the genus, but only four of them were largely accepted: *Limnatis nilotica* (Savigny, 1822), *Limnatis paluda* (Tennent, 1859), *Limnatis haasi* Johansson, 1927, and *Limnatis bacescui* Manoleli, 1972. Nonetheless, the taxonomic status of the last three species is doubtful and much debated in the scientific literature. Recent genetic studies have confirmed the validity of at least four species, *Limnatis nilotica*, *Limnatis paluda*, and two as of yet undescribed *Limnatis* from Namibia and Croația.

To ascertain the identity of *Limnatis* in Romania we have sampled in the type locality of *Limnatis bacescui*. Based on dorsal and ventral coloration pattern the specimens were identified as *Limnatis paluda*. The results of ML phylogeny constructed using COI also confirmed that the Romanian specimens belong to the clade of *Limnatis paluda* which contains specimens from Afghanistan, Iran, Türkiye, Azerbaijan, Kazakhstan and Uzbekistan. Our results confirm the distribution range for *Limnatis paluda* in Europe and prompt us to develop a more comprehensive study of the phylogenetic status of the *Limnatis* genus in Southern Europe and Northern Africa.

The curious case of the peregrine centipede (Chilopoda, Lithobiomorpha, Lithobiidae) in Romania

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Key words: centipede, cave, Danube Gorges.

We describe for the first time the presence of *Lithobius peregrinus* Latzel, 1880 in Romania. 38 individuals of *L. peregrinus* were collected from Gaura cu Muscă Cave (Danube Gorges, Locvei Mountains). The sampling campaigns extended over 3 years and all seasons (September 2022 – July 2024). Most individuals were observed in the intermediate and the deep parts of the cave (approx. 100 meters away from the cave entrance). Sampling efforts in epigean habitats (scree slopes with leaf litter and soil), as well as other four caves situated in the vicinity did not provide positive results.

Historical data is available from a series of 7 caves situated along the Romanian side of Danube Gorges, before the dams of Iron Gates changed the landscape, but only *Lithobius crassipes* L. Koch 1862 and *Scutigera coleoptrata* (Linnaeus, 1758) were reported from Gaura cu Muscă Cave by Negrea & Negrea, 1969 and although Banat Mountains is a relatively well studied area, *L. peregrinus* has never been mentioned.

This centipede was redescribed by Barber and Eason, 1985 and its taxonomy was furthermore elucidated by Zapparoli, 1992 which concluded that *L. peregrinus* is originally a trans-Adriatic species, characterized by a patchy geographic distribution, known from several introduced and isolated populations. The Romanian population has a larger variability in leg plectrotaxy with high incidence of left/right asymmetry compared with other European populations, as well as interesting development and regenerative teratological aspects and semiaquatic behavior which likely enabled the colonization of this active cave and to access aquatic prey as it was discussed in other *Lithobius* species (Dányi et al., 2019).

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Qualitative observations regarding the presence of some arthropod species in the period 2021-2024 in the green space within the Constanța Complex Museum of Natural Sciences

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Key words: arthropods, insects, urban environment, biodiversity.

The urban space, with a growing human population, both inside the cities and around them, has led to the reduction of existing green spaces in the city of Constanta and beyond.

The reduction of green spaces influences the existing arthropod communities in them.

The interest in arthropod communities found in the urban green space is increasing not only due to the urbanization of areas adjacent to cities, but also due to the transport of plants and materials in the newly created urban areas, as well as due to recent climate changes. This conjuncture makes these green areas in cities a relatively easy target for invasive species.

The present paper presents some qualitative observations regarding the presence of some species of arthropods in the green space of the Constanta Complex Museum of Natural Sciences, between 2021 and 2024.

Odonata (Insecta) from the Prut River Basin, Republic of Moldova

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Key words: adult, larva, species diversity, new data, Prut River.

The study of larvae and adults of Odonata species was carried out during the spring-autumn periods of 2023-2024. Sampling has been made from the Prut River riverbed and ponds, streams, lakes, irrigation basins, located along the Prut River.

The list of Odonata species from the Republic of Moldova was recently updated and includes 46 species considered credible (Buşmachiu & Munjiu, 2024).

In the last 2 years, special studies were carried out on the species diversity of Odonata in the Prut River Basin, localities: Branişte, Bursuc, Cahul, Costeşti-Stanca, Cîşliţa-Prut, Giurgiuleşti, Ivanovca, Leuşeni, Măcărești, Sculeni, Șișcani, lakes Beleu and Manta. The distribution of species.

As a result of the survey, 28 Odonata species were identified in the riverbed and adjacent water bodies along the Prut River. In 2024, the list of localities where the presence of adult individuals of *Chalcolestes parvidens* (Artobelevski, 1929), *Lestes macrostigma* (Eversmann, 1836), *Sympetrum fonscolombii* (Selys, 1840) and *Sympecma fusca* (Vander Linden, 1820) was expanded.

Larvae of *Sympecma fusca* were firstly recorded in the Manta Lake, while the presence of *Stylurus flavipes* (Charpentier, 1825) larvae near Leuşeni locality were reconfirmed.

The study was supported by the subprogram 010701 „Evaluation of the structure and functioning of the animal world and aquatic ecosystems under the influence of biotic and abiotic factors in the context of ensuring ecological security and the well-being of the population" and project „Assessment of the state of plant, fungi and animal species, development of the list of species with rarity status and the algorithm for their presentation in the 4th edition of the Red Book of the Republic of Moldova".

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Diversity of Jewel Beetles (Coleoptera, Buprestidae) of Georgia

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Key words: diversity, jewel beetles, annotated list, Georgia**.**

Buprestidae, the cosmopolitan family of beetles, includes more than 15,500 described species. 2,617 species are distributed in the Palaearctic region, 133 (27 genera) of which were recorded in Georgia. The first data on Georgian jewel beetles was found in the 70s of the 19th century. The group was intensively studied until the 80s of the 20th century by Georgian and foreign scientists. However, from this period to the present day, no systematic studies of this animal group have been carried out, and the data on the current species composition were fragmentary and scarce. Therefore, our investigations aimed to update knowledge on the species diversity of Georgian Buprestidae.

The material was collected mainly from the Georgian Protected Areas and their environs, during 2021-2024. The materials of the project-Caucasus Barcode of Life (CaBOL), and the Museum of the Institute of Entomology (Agrarian University of Georgia) also were used.

Based on the summary of literary and own data for the first time, an annotated list of Georgian buprestids was created. Nowadays, the list unites 155 species belonging to 28 genera (subfamilies Agrilinae, Buprestinae, Chrysochroinae, Julodinae, and Polycestinae). The diversity of Georgian Buprestidae has been increased by 1 genus and 22 species. One genus, *Habroloma* Thomson 1864, and 6 species are recorded for the first time for Georgia and 1 species of the genus *Sphenoptera* Jakovlev 1908 is new to the Caucasus.

This work is supported by a Master's study-research grant project (MR-23-292) of Shota Rustaveli National Science Foundation of Georgia.

Beetles (Insecta, Coleoptera) from the anthropic subterranean habitats and adjacent caves in Southern Carpathians: preliminary results

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Key words: Coleoptera, tunnels, mines, ecological shelters, species richness, diversity.

In the years 2023 and 2024 we investigated the species communities of 14 anthropogenic underground cavities (tunnels, mine galleries) compared to 7 natural caves in their vicinity in the Southern Carpathians. The aim was to observe the ecological potential of cavities as shelters for different species, in the context of climate change. The species were collected from the walls and floor of the cavities in three sampling areas: the entrance, middle and depth of each cavity, twice a year. Relative humidity, temperature, gallery development, number of entrances, availability of detritus and presence of water were recorded for each cavity. The species richness was estimated using the Jakknife estimator and the faunal heterogeneity (diversity) using the Brillouin index with bootstrap estimate method. Up to present, we identified 73 species of Coleoptera belonging to 20 families. Of these, 47 species (64 %) were unique (found in only one cavity) for anthropic cavities and 16 species (22%) as unique for caves. The estimated richness varied between 34 (tunnel Ploștina) to 3 (tunnel Zărnești) and it was 6 in the tested caves (Izvorul Pietrificat and Ponorul Uscat). Our preliminary data suggests that the species richness is influenced by the combination of local environmental factors, the most important being the presence of water, the number of entrances, the length of the gallery and the availability of vegetable debris. The diversity index varied from 2.85 for Tunnel Ploștina to 0.9 in Tunnel Zărnești. The species composition and species rarity have also been an important goal for us. The presence of several interesting species (*Contaciphon ruficeps*, *Leptinus testaceus*, *Trechoblemus micros, Duvalius deubelianus, Luciola italica, Lamprohiza splendidula*) in subterranean cavities is discussed. The observed combination of phytophagous species together with detritivores and predatory ones is interesting for future studies of species communities in anthropogenic cavities as potential ecological shelters.

Second record of *Megastigmus irinae* Popescu, 2023 (Chalcidoidea, Megastigmidae) in the Maldives Archipelago, from Nalaguraidhoo (Alif Dhaal Atoll) Island

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Key words: *Megastigmus irinae*, Megastigmidae, Chalcidoidea, Hymenoptera, Maldives archipelago.

Between 2017 and 2023, we conducted expeditions to several islands in the Maldives Archipelago: Nalaguraidhoo (Alif Dhaal Atoll) (2017, 2023), Dhigurah (Alif Dhaal Atoll) (2017), Maamigili (Alif Dhaal Atoll) (2017, 2023), Dhiffushi (Kaafu Atoll) (2017), Hulhumale (North Male Atoll) (2017, 2020, 2022), Lhohifushi (North Male Atoll) (2018), Furaveri (Raa Atoll) (2020), Iru Veli (Dhaalu Atoll) (2021), and Kihaadhuffaru (Southern Maalhosmadulu Atoll from Baa Atoll) (2022). The Chalcidoidea fauna from the Maldives archipelago was almost unknown until these investigations (Popescu & Gostin 2017, 2018).

Megastigmus irinae was obtained from the seeds of *Pemphis acidula* (Myrtales: Lythraceae) collected from Kihaadhuffaru and Lhohifushi islands in the Maldives Archipelago. *M. irinae* is a strictly phytophagous species, one larva consuming a single seed from the capsules of *P. acidula* and is the only species from Megastigmidae having a species from Lythraceae as a host plant. It is also the only one association of Chalcidoidea with the genus *Pemphis* and the single species of Megastigmidae and *Megastigmus* known from the Maldives Archipelago. With good eyes, despite the small dimensions, around 1.5-2 mm in length, the adults of *M. irinae* can be observed flying and walking on the host plants of *P. acidula* (Popescu & Gostin 2023).

In 2023 we made an expedition on Nalaguraidhoo island and even though we didn't find *M. irinae* in 2017 on this island, we succeeded to find it now. So, for the moment, this species is an endemic species recorded just from three islands from the Maldives archipelago: Kihaadhuffaru, Lhohifushi and Nalaguraidhoo. But, if we look at the distribution of the host plant, *P. acidula*, from East Africa to India, Southeast Asia, Japan, Australia, Micronesia, the Pacific Islands, and French Polynesia, the future investigations can considerably extend the known distribution area of *M. irinae*.

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Morphology and histocytology of *Lasioptera rubi* galls from *Rubus idaeus*

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Key words: *Lasioptera rubi*, Cecidomyiidae, *Rubus idaeus*, galls, morphology, histocytology.

Rubus idaeus has LC position in IUCN Red List, due to global decline and decrease of quality of specific habitats by agricultural intensification and silviculture. Raspberry has been domesticated for fruit production with mentions from Aristotle and Pliny. The entire plant can be used as astringent, the volatile components from fruits having antibacterial activity, fruits being rich in antioxidants. Cecidomyiidae is a very diverse family with phytophagous, mycophagous, mycosaprophagous, xylophagous and zoophagous species, numerous of them producing galls, being important pests. Species of *Lasioptera* are generally gall makers in stems, these galls being frequently associated with fungal mycelia, so called "ambrosia galls". *Lasioptera rubi* (raspberry gall midge) make galls on stems of *R. idaeus*, being the single one species of the genus developing in *Rubus*.

L. rubi becomes a serious widespread pest of raspberry crop in Romania. Damage produced by *L. rubi* comes from the developing larvae inside the canes of *R. idaeus* leading to apparition of prominent galls inside the canes, sometimes on petioles. The morphology of these galls was just superficially presented in anterior studies (Meyer, 1952, Meyer & Maresquelle 1983). This is the first complex study on *L. rubi* galls, with investigation on types of galls, locations, external morphology, internal anatomy, histocytology, histochemistry, biometry etc. We present a rich illustration using macrophotography, light microscopy, Scanning Electron Microscopy (SEM), and original drawings. Infested canes present inhibited growth, fruit formation being affected, leading to harvest loss. Infested canes can break under the galls, negatively affecting the plant. Using pesticides against *L. rubi* can be harmful to humans and the environment. Environmentally friendly substitutes like the essential oils used as green insecticides are not yet investigated in controlling *L. rubi* (Gostin & Popescu 2024, Popescu et al. 2024). Recommended is visual control of canes, cutting and destroying the ones with galls.

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Fossil and current ant species from Blănarului Hill (Vlădiceni, Iași County, Romania)

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Key words: ants, fossil ants, fossil insects, Sarmatian, Miocene.

The ant (Hymenoptera, Formicidae) fauna of Romania is not as well studied as in western Europe due to lack of experts in the field. The geographical positioning and the diversity of habitats suggests that the number of ant species in Romania could be larger than the one currently known. There is also much left to be studied when it comes to their ecology and the distribution of rare species. This study was aimed at identifying the current ant species from Blănarului Hill (Vlădiceni, Iași County) fossil site and its surroundings. The site was discovered only in 2020 and is dated to upper Bessarabian [middle Sarmatian (s.l.), upper Miocene]. The collected specimens were used as comparative material for describing the fossil ants discovered at the same site. The ant fauna of the site and the surrounding area is composed of 19 species belonging to 3 subfamilies and 9 genera, the most common of which is *Formica* Linnaeus with 5 species, followed by *Lasius* Fabricius with 4 species. As for the fossil specimens, we have catalogued and photographed ants and other arthropod fossils to ease the access of future researchers to them. Most of the fossils are of terrestrial arthropods of which ants are the most numerous. The importance of the study consists in the documentation of ants in the fossil record of Romania and in bringing attention to the arthropod fossils belonging to other taxa, for future research on them.

Extending the Sea-Level Sensitive dynamic model of marine island biogeography to include fusion-fission islands

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Key words: drivers of diversification; glacial-interglacial cycles; island fusion-fission cycles; marine island biogeography; Moliones islands; sea-level oscillations; Solum islands; Soror islands.

This study extends the Sea-Level Sensitive dynamic model of marine island biogeography (Ávila et al., 2019), by integrating the dynamics of fusion-fission islands during glacial-interglacial cycles. We discuss the littoral area variation by Pleistocene sea level change, and its effect on the evolutionary rates of splitting, extinction, and merging of populations, as well as on the speciation rates of marine shallow-water organisms. We distinguish three different types of fusion-fission islands: Solum islands, i.e., islands that have never merged with neighbouring islands during sea-level low stands associated with glacial episodes; Soror islands, i.e., islands that are subjected to fusion-fission cycles due to sea-level changes; and Moliones islands, i.e., two or more islands that, independent of sea level, are

functionally connected from a marine point of view, as the seafloor depths that separate them are shallower than 50 m. For this study, we selected 324 islands located in temperate and tropical climates: 50 Solum islands, 77 islands making up 20 groups of Soror islands, and 197 islands from 34 groups of Moliones islands. Sea-level variation during glacial-interglacial cycles induced changes in the insular littoral area (ILA), which translates into five general types of ILA change curves hereby described and related with several variables, including the age of the island, the tectonic setting, as well as the presence of submarine terraces and subaerial terraces, and also of coral reefs. Finally, we provide several predictions on the frequencies of marine population splitting, extinction, and merging events, as well as, on the speciation rates of shallow-water marine organisms, according to the respective island type.

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Redescription of the last instar larva of *Eurythyrea aurata* (Pallas, 1776) using microphotography and SEM techniques

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Key words: Redescription, *Eurythyrea aurata*, larva, microphotography, SEM techniques

The larval stage of *Eurythyrea aurata* (Coleoptera, Buprestidae) was initially described by M. G. Volkovitsh in 1975 and documented in the Russian language, primarily for comparative purposes vis-à-vis the larval form of *E. quercus*. This scholarly endeavor was supplemented with meticulously crafted illustrations of exemplary quality.

A comprehensive redescription of the mature larva of *Eurythyrea aurata* is presented herein, employing microphotography and scanning electron microscopy (SEM) images as demonstrative examples of head and mouthparts, thoracic plates and both thoracic and abdominal spiracles. We pay close attention to the mouthpieces and the types of sensilla they are fitted with. Furthermore, endeavors were made to establish correlations between these morphological attributes and the larval biology.

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Genetic analyses of the Anatolian populations with different total number of chromosomal arms (NF) of Turkish Hamster (*Mesocricetus brandti* Nehring, 1898)

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Key words*: Mesocricetus brandti*, Turkish Hamster, Cytochrome oxidase-I, Anatolia

Mesocricetus brandti (Turkish Hamster) has a distribution including Türkiye (Anatolia), Armenia, Georgia, Azerbaijan, northwestern Iran and Dagestan/ Russia (Pavlinov et al., 2002). Sub-populations of *M. brandti* show differences in terms of morphology and karyology (Yiğit et al., 2000, 2006). Although the diploid chromosome number (2n) is 42 in Turkish samples, the total number of chromosomal arms (NF) was observed as 82, 83, and 84. It was revealed that FN= 83 samples were hybrid individuals resulting from the mating of samples FN= 82 and FN= 84. The few genetic studies conducted include the allozyme method (Yiğit et al., 2007), and the Cytochrome-b gene region analyses (Neumann et al., 2017).

In this paper, samples with the total number of chromosomal arms of 82, 83, and 84, collected from the Central Anatolia, Central Eastern Anatolia, and Eastern Anatolia regions of the Turkish hamster populations, were analyzed for the first time using the Cytochrome oxidase-I (COI) gene region. Phylogenetic approaches (Maximum Likelihood and Bayesian MCMC trees and Median-joining network) yielded three lineages, one lineage of which was from Konya Province (Central Anatolia), the other two lineages consisted of Central Eastern Anatolia and Eastern Anatolia samples which were not separated, and no distinction was observed according to the NF numbers. Also, the Konya (Central Anatolia) sample was positioned as the basal group. In addition, the mean genetic distances between these lineages according to the *p*-distance (Hamming, 1950) Parameter were found to be between 7.3-7.8%, and regarding the genetic diversity values, polymorphism between lineages was high. Additionally, the divergence times of the three lineages were dated to 616.000 years ago.

As a result, based on the COI region analyses, no distinction was observed between Anatolian populations of *M. brandti* according to the NF numbers, but differentiation was observed between Central Anatolia and Central Eastern Anatolia/Eastern Anatolia populations.

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Symbionts with symbionts: endosymbiotic bacteria of parasitic chewing lice

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Key words: Phthiraptera, *Sodalis*, co-speciation, phylogeny, host-association

Endosymbionts are commonly associated with insects and have interactions ranging from parasitic to mutualistic. In recent years, bacteria in the genus *Sodalis* and bacteria belonging to the family Enterobacteriaceae have been identified as endosymbionts within some groups of chewing lice (Insecta: Phthiraptera: Ischnocera). While other insects are highly mobile and able to respond quickly to adverse conditions in their environment, chewing lice are unable to, due to their permanent parasitic lifestyle. Chewing lice generally rely on direct contact between hosts to disperse, which would limit the opportunities to acquire novel strains of symbionts. Nevertheless, endosymbiont strains are not always perfectly co-radiating with their louse hosts. The routes of acquisition are presently unknown, but due to the lack of free-living stages in the life-history of lice, the options are limited. One option is that they derive novel strains of bacteria from their hosts. Here we examine the endosymbionts of chewing lice parasitizing shorebirds (Charadriiformes). Hosts in this group are generally each parasitized by 1–3 species of ischnoceran chewing lice in the *Quadraceps*-complex, as well as some that are more distantly related (*e.g., Carduiceps*). Phylogenetic data from lice in these genera collected in South China were used to test whether lice in different genera parasitizing the same host have bacterial symbionts that are more closely related than expected by chance. Moreover, we examined whether closely related louse species had closely related symbionts.

Hypogean versus epigean ecotypes of *Gammarus balcanicus* in Apuseni Mountains (Romania)

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Key words: hypogean, epigean, *Gammarus*, food-webs, subterranean

The species from genus *Gammarus* sp. occasionally colonize subterranean habitats, including caves. Following adaptation to the subterranean realm, surface (epigean) versus subterranean (hypogean) populations are characterized by contrasting morphological, life-history and ecophysiological adaptations. In the current survey, a hypogean and an epigean population of the species *Gammarus balcanicus* was surveyed between 2017-2018 for one year in a cave stream flowing through a cave from the Apuseni Mountains (Romania). The results showed that the hypogean population comprised albino individuals (fully depigmented, except for the eyes) that were significantly larger compared to their surface conspecifics, had larger body-size at sexual maturity and that the females produced fewer, but larger eggs, compared to the epigean conspecifics. The trophic position and omnivory were significantly higher for the hypogean versus epigean population and the elemental imbalance for phosphoruswas lower, but similar for nitrogen. Another survey (2021) revealed that following a period of heavy rainfalls, the albino hypogean ecotype was replaced with an abundant epigean population.

First steps in reconstructing the phylogeny and evolutionary history of Alpine groundwater *Niphargus* (Crustacea, Amphipoda)

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Key words: *Niphargus*, amphipod, subterranean fauna, Alps, genome skimming.

Subterranean fauna is an important contributor to global biodiversity. An emblematic taxon of groundwater amphipods is the genus *Niphargus*, which comprises over 440 described species. *Niphargus* is the most common and species-rich subterranean amphipod genus of the West Palearctic and inhabits almost every kind of groundwater in Europe and the Middle East. Although few species from the genus had previously been discovered in high-elevation caves and karstic springs, it is only recently that it was found to be widely distributed along the Alpine chain.

Unfortunately, the taxonomy of most clades in the genus remains unresolved, especially because of old and inadequate morphological descriptions. For this reason, high-quality DNA sequence data are needed to build a strong phylogenetic tree and to obtain a correct reconstruction of the evolutionary history of the genus.

We sampled all type localities of species present in the Alps and collected at many new sites, both in formerly glaciated areas and in areas very close to the Quaternary glacial maximum. We focused our work on mainly three DNA markers, a portion of 28S and the entire ITS region (both part of nuclear rDNA) and the mitochondrial COI, switching from Sanger sequencing to nanopore amplicon sequencing. Furthermore, we sequenced and assembled whole mitogenomes using nanopore-based genome skimming. All sequences of Alpine species stored in GenBank were downloaded and included in the analysis as well.

Combining these two approaches we were able to define the phylogeny of several species complex (such as *N. stygius* and *N. thuringius* - *N. dolenianensis*) from the Alpine chain and to reconstruct the biogeography of different lineages showing several independent colonisation events of the Alpine area at different periods.

The analysis of a hybrid between *Dorcadion lugubre minkovae* Heyrovský and *D. lineatocolle* Kraatz (Cerambycidae, Lamiinae) — a singular occurrence or a recurring event?

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Key words: DNA barcoding, hybrid, introgression, nuclear markers, *Dorcadion*.

Dorcadionini is a hyperdiverse tribus of Lamiinae (Coleoptera, Cerambycidae) with more than 800 described taxa and a Palearctic distribution. Though rare specimens suspected of being hybrids have been known for some time, it is only recently that the use of genetic data showed that interspecific hybridisation might play an important role in shaping their diversity. The aim of this study is the comparative analysis of a hybrid individual with the putative parental taxa *Dorcadion lugubre minkovae* Heyrovský and *Dorcadion lineatocolle* Kraatz, uncovered following a previous DNA barcoding study. The samples for this study were collected from northern Greece and southeastern Bulgaria, i.e. the border area between these two countries, where these species have a sympatric distribution. By using an integrative approach, we have investigated several individuals of *D. lugubre lugubre* Kraatz, *D. lugubre minkovae*, *D. lineatocolle* and the hybrid, looking at the morphology, the karyotypes, two mitochondrial molecular markers and five nuclear molecular markers. We were able to identify the origin of the hybrid and to clarify if this phenomenon is common in the area or is just an accidental occurrence. Additionally, we have observed some other inconsistencies between the morphology and the genetic information obtained from the molecular markers we used regarding *D. lugubre minkovae* that may help us gain more information about the evolution of this group, about the frequency of hybridisation and its impact on species and local populations.

Water scorpions of the Holarctic (*Nepa* spp., Insecta: Hemiptera): genetic diversity and phylogeography

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Key words: *Nepa*, phylogeography, water scorpions, genetic diversity.

Water scorpions of the genus *Nepa* are predatory freshwater insects present across the Northern hemisphere. There are currently five accepted species: the widely distributed *Nepa cinerea* (Eurasia and North Africa), *N. anophthalma* (endemic to Movile Cave, Romania), *N. sardiniensis* (Sardinia and Corsica), *N. hoffmanni* (East Asia), and *N. apiculata* (North America). Specimens covering the entire distribution and taxonomic range were sequenced. One mitochondrial marker (COI) was used for high-resolution phylogenetic reconstruction and detection of phylogeographic patterns and one nuclear marker (28S) was used to confirm species delimitation. *Nepa cinerea* populations show a clear phylogeographic signal and species delimitation tests indicate a cryptic diversity in the Western Mediterranean basin. They also point to a larger extent of *N. sardiniensis* distribution, being sympatric with *N. cinerea* in Northern Africa and Eastern Spain. We show that *N. sardiniensis* is present also in Sicily. Varying degrees of gene flow are present between surface and cave populations of *N. cinerea* and *N. sardiniensis*. The East Asian (*N. hoffmanni*) and North American (*N. apiculata*) species are distantly related to the Eurasian species, suggesting their possible assignment to a new genus. *Nepa anophthalma*, is the only species considered truly cave adapted (depigmentation, loss of eyes), and is genetically closest to *N. cinerea*. Whole genome sequencing projects are currently underway, in an effort to understand the evolutionary history and adaptations of this species to the sulfidic conditions of Movile Cave.

Intra and interspecific genome size variations in arthropods

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Key words: Feulgen image analysis densitometry, genome size, C-value, niphargids, *Asellus*, *Nepa*.

Genome size is a fundamental biological trait that is known to vary considerably across eukaryotic species. Although there have been many studies about interspecific differences in genome size, its intraspecific diversity has been scarcely studied to date. Using arthropods as a model system, we investigated both intra- and interspecific differences in genome size on three selected groups of arthropods: i) niphargid amphipods; ii) *Nepa* insects; iii) *Asellus* isopods. Sequences of mitochondrial COI and nuclear 28S markers were used to construct haplotype networks to delineate species boundaries.

Using a refined Feulgen Image Analysis Densitometry protocol, we found significant differences (2-fold to 3-fold variations) in genome sizes between closely related individuals and species. We are now starting whole-genome sequencing of conspecific individuals of contrasted genome sizes to find out whether hypotheses about the potential genomic factors contributing to the observed differences are due to whole-genome duplications, copy-number variations, supernumerary chromosomes and/or variations in the relative amount of non-coding sequences versus gene-coding ones.

The phylogeography of pelagic eagle rays (Aetobatidae), genetic patterns and coastal ecosystem dependencies

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Key words: spotted eagle ray species, allopatric species, coastal ecosystems, phylogeography.

Spotted eagle rays are large, free-swimming batoids that trophically depend on the benthos. Although commonly occurring on coral reefs and associated habitats, they can undertake long pelagic migrations and are consequently considered semipelagic organisms (i.e., organisms that penetrate oceanic waters but concentrate near continental landmasses). These life history traits, combined with the lack of clear biogeographical barriers to dispersal in marine environments, led to the long-held assumption that spotted eagle rays comprised well-connected populations forming a single circumtropically distributed species. However, molecular data have revealed high levels of genetic structure, possibly due to their apparent dependency on coastal ecosystems. These genetic patterns have resulted in the splitting of spotted eagle rays into several allopatric species.

We herein attempt to link genetic patterns with underlying ecological processes in a phylogeographic study of the pelagic eagle rays (Aetobatidae). We applied molecular species delimitation methods to samples collected throughout the circumtropical distribution of the clade, revealing the presence of several hypothetical species units.

These data were then combined with public sequence data to reconstruct a time- calibrated phylogeny of the species complex. Our findings suggest that the evolutionary history of Aetobatids is linked to shifts in biodiversity hotspots associated with coral reefs. We conclude that the migratory propensity of these semipelagic organisms is diminished by their dependency on coral reefs and associated coastal ecosystems.

Cytogenetic analysis of satellite content of five species of arvicolid rodents (Arvicolinae, Rodentia)

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Key words: satellite DNA, arvicolid rodents, cytogenetic analysis, genome-wide study.

Satellite DNA motifs have an important role in the function and evolution of the genome, as well as in cellular processes, including chromosome segregation, genome organization and protection of chromosome ends. They consist of tandem repeats that are present mainly in heterochromatic regions, such as centromeric, pericentromeric and subtelomeric regions. In addition, rearrangements within autosomes as well as differentiation of sex chromosomes can lead to significant differences between species in the qualitative and quantitative characteristics of satellite DNA motifs.

The arvicolid voles (Arvicolinae, Rodentia) have a high degree of divergence in karyotypes and sex chromosome morphology, which makes them an interesting subject to study the evolution of satellite DNA motifs. Despite this importance, no genome-wide study of satellite DNA motifs has been conducted yet. To expand our knowledge, we conducted Illumina sequencing of genomic DNA at five arvicolid rodents (*Lagurus lagurus, Myodes glareolus, Microtus cabrerae, Microtus fortis, Microtus thomasi*), covering phylogenetically distant clades.

We identified in total 29 different types of satellite DNA motifs by RepeatExplorer. *In situ* hybridization experiments showed that the majority of the satellite DNA motifs accumulate in centromeres, telomeres, or the sex chromosomes.

Hybridization between native red deer (*Cervus elaphus*) and introduced sika deer (*Cervus nippon*) and impacts to red deer populations

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Key words: red deer, sika deer, hybridization, population structure.

The red deer is a native species in Central Europe, but the areas where it lives in sympatry with the introduced sika deer have been increasing in the last three decades. Hybridization between the two species and changes in population genetic structure are the most important problems. Red deer stags may be attacked by sika males, which are extremely aggressive in the rutting season and may mate with red deer hinds, with the inherent risk of hybridization and introgression between the two species. Genetic diversity of the red deer and the sika deer species was studied by using tissue samples from the legally hunted animals in Lithuania. Genotyping was based on microsatellites loci (STR) of nuclear DNA. Molecular genetic data combined with evaluation in statistical programmes could lead to a complex view of populations and differences among them. Results of hybridization between the two species are documented in different EU countries. Impacts to red deer populations are discussed.

Phylogenetic evidences indicating more close relationship between the Caspian Sea and the Black Sea fish fauna, lessons from Clupeidae and Atherinidae

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Key words: Silverside, Pontocaspian, sprat, phylogeny, biogeography.

It is confirmed that, about two million years ago, the Caspian Sea became permanently landlocked and separated from the Black Sea at the start of the Pleistocene epoch, but the timing of their last connection is a subject of debate (Bista, 2019).

Two complex groups including silver sides *Atherina* spp. and sprats *Clupeonella* spp. are distributed around the Ponto-Caspian region. *A. boyeri* from the Black Sea and *A. caspia* from the Caspian Sea and *C. cultriventris* from the Black Sea and *C. caspia* from the Caspian Sea are congener species that are taxonomically ambiguous (Coad, 2017). Their morphological features (body and otolith) and two molecular markers including Cyt-b and COI genes sequences were examined for a better understanding of their taxonomy and divergence.

Fish specimens were collected from the coastal waters of the Caspian Sea (Mazandaran and Guilan provinces) and Black Sea (Samsun province) by a beach seine during summer 2023. Morphometric and meristic characters were measured and counted. SEM photos and geometric morphometric characters were used to compare their Saggita otoliths. COI and Cyt-b genes sequence and species delimitation model (ABGD) were used to evaluate their phylogenetic status.

Despite some morphological differences in otolith and body, molecular data indicated that samples from *A. boyeri* and *A. caspia* and also *C. cultriventris* and *C. caspia* belong to the same species, and their divergence time is related to a more recent time comparing ecosystem distinction time (Two million years ago).

Lack of genetic species boundaries is possibly related to the recent isolation of the *A. boyeri* and *C. cultriventris* in the Caspian Sea from the Black Sea, during the Pleistocene era (about 50,000 years ago).

This information indicates non validity of *C. caspia* and *A. caspia* at species level which were described recently based on just morphological characters and habitat distinction. Also, a connection between the Black Sea and the Caspian Sea during the Late Pleistocene and interglacial periods is suggested.

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Protecting Romanian biodiversity: national and international legal frameworks

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Key words: Natura 2000, *Habitats Directive,* protected areas.

Romania ratified the *Convention on biological diversity* (*Rio de Janeiro, 1994*) through *Law 58/1994***.** The objectives of this convention are the conservation of the biological diversity and the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources, especially by appropriate access to these resources and by appropriate transfer of relevant technologies.

Starting with 2007, Romania became a member state and were designated Natura 2000 Network based on the *Habitats Directive 92/43/EEC on the conservation of natural habitats and of species of wild flora and fauna*, and the *Birds Directive 79/409/EEC on the conservation of wild birds.*

The designation of sites of community importance (SCI) is done within the European Natura 2000 Network and is permanently supplemented with additional designations by the member states of the European Union (EU).

In 2007, Natura 2000 network in Romania included 273 Sites of Community Importance (SCIs) and 108 of Special Protection Areas (SPAs). In 2011, the Natura 2000 network in Romania was extended and 109 new SCIs were added, and another 40 SPAs were added. In 2023, a total of 11 SCIs were admitted as Special Areas of Conservation (SAC) under the *Habitats Directive*. Because the designation of sites is a continuous process, currently (2024) the network includes 442 SCIs and 171 SPAs.

The national network with a total of 961 protected areas includes: biosphere reserves (declared under the auspices of UNESCO), RAMSAR Site (Wetland of International Importance), World Heritage Site (natural or mixed), scientific reserves, nature reserves, national parks, natural parks, geologic parks and natural monuments.

Romania has a total 1574 different protected areas, a part of them are sites of community importance and other part is protected areas of national/international interest, covering 24.52% of the state's area, and 23.1% of marine waters. Regarding their surface, between all these protected areas there are overlaps, also total or partial inclusions.

Romania has 533 species and 87 habitats protected under EU law. As all Member States, Romania still needs to make significant efforts to establish and effectively implement conservation measures for species and habitats, and also management plans for protected areas.

The role of management and environmental variables on soil invertebrates' connection with plant species in some grasslands from Făgăraș Massif

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Key words: grasslands, management, environmental variables, soil invertebrates, plant species, Făgăraș Massif.

Sheep grazed from centuries by local people, the grasslands from Făgăraș Massif are under different grazing intensity impact. The management practices applied by local people determine the poor or medium quality of the pastures from alpine and subalpine zones of Făgăraș Massif.

Our study focused on two pastures with varied vegetation coverage due to the different intensity impact of grazing. Establishing 200 quadrats (10 quadrats on 10 transects for each pasture), we recorded: plant species and established their percentage coverage; environmental factors (temperature, air and soil humidity, soil reaction, its penetrability and physical and chemical characteristics); invertebrates from soil, for each using specific methods and creating a database.

The statistical analysis of the database highlighted the dominant vegetation in both grasslands is *Violo declinatae-Nardetum* Simon 1966 with local variations in both grasslands. The invertebrates' diversity is positively correlated with plant species' diversity and their rooting system and together modify the environmental conditions at local scale. (Carrillo et al., 2011; Chiriac et al., 2020)

The functional and structural parameters of plant species and invertebrates' populations is determined by management practices applied on the pastures (grazing impact intensity), by chemical and physical factors that vary in space and time, all of them greatly influencing each other at local scales.

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Soil biodiversity structure in response to land use types and intensity from Pannonian region of Romania

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Key words: biodiversity, linkages, ecosystem services, *challenges*

The SOB4ES EU-funded project develops an integrated framework that accurately reflects the impact of soil biodiversity on ecosystem services across time and space visible to society alongside integration into EU policies services. We will achieve this by evaluating soil biodiversity composition, dynamics, connections with aboveground biodiversity, and network structure under various land uses on nine major pedoclimatic (soil type-climate) regions of Europe. We present here some preliminary results from Pannonian region (Romania) and land uses, including soils from 51 sites: urban, agriculture, forest, wetlands, orchards and grasslands. In each investigated site, 3 plots were established. In total, 153 soil samples were collected for each soil fauna group: Collembola, mites (Mesostigmata, Oribatida, Prostigmata), earthworms, nematodes and enchytraeids.

The results are presented as land use intensity nested within land use type. At the same time, some soil properties were investigated: nutrients (potassium and phosphorus), carbon content, bulk density, saturated hydraulic conductivity, pH and soil moisture. The statistical analyses (VIF and GLMM) were performed in R software (vers. 4.4.1, R Core Team 2024). One-way NPMANOVA was used to identify differences between soil fauna groups. Pairwise NPMANOVA between the pairs of soil fauna groups are provided as a post-hoc test.

One way NPMANOVA indicated that there are significant differences ($F=1,647$; $p=0.04$) as regarding abundances of soil fauna between land use type. Collembola and oribatid mites were more abundant than other groups. Forest and urban ecosystems offered the most favourable conditions for soil fauna. Oribatida populations were significantly related to potassium oxide, moisture and pH. Earthworms were significantly connected to potassium oxide and pH. All the other groups of soil fauna were not significantly related to environmental variables.

In the end, we intend to address the interoperability of this database from Pannonian region so it can be *potentially* used in European and National legislation.

Edaphic mites (Acari, Mesostigmata) – microscopic bioindicators of some praticolous ecosystems from Romania

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Key words: abundance, environment, grassland, grazing, mite, soil.

Grasslands are one of the most important terrestrial ecosystems, strongly associated with human activities. Overgrazing is one of the most spread threats for grasslands. In order to demonstrate the impact of the grazing management on soil mites, four intense grazed and four ungrazed grasslands were studied in Romanian Carpathians.

Edaphic mites are one the most important bioindicators of the ecological status of soils, having two basic and important features: they are one of the most abundant invertebrate groups and they are very sensitive to any environmental disturbance. In order to demonstrate this sensitiveness, eight variables were investigated: vegetation coverage, air temperature, air relative humidity, soil temperature, soil moisture content, soil electrical conductivity, soil acidity and soil penetration resistance. These environmental parameters differed significantly between grasslands. The grazed ones were characterized by the highest values of air temperature, soil acidity, soil electrical conductivity, soil resistance at penetration and vegetation coverage. In the second ones were described the highest values of air relative humidity, soil temperature and soil moisture content.

In total, 80 soil samples were analyzed, with 30 species of mites and 184 individuals. Our study revealed significant differences between two types of managed grasslands, with higher species diversity and equitability in ungrazed ecosystems. The grazed grasslands were characterized by the highest value of numerical abundance (115 individuals), compared with 69 individuals from ungrazed ecosystems. This difference was due to the high numerical dominance of *Alliphis halleri* (G. & R. Canestrini, 1881) (64 individuals), identified in the grazed ecosystems. This species is sapro-coprophilous detriticole, showing a wide ecological plasticity, distributed from lowlands up to subalpine zone of many European countries. Multivariate analysis demonstrated that intense grazing influenced negatively the soil fauna communities.

The structure of the invertebrate fauna in forest and alpine habitats included in ecological reconstruction programs in the Făgăraș Mountains area (Romania)

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Key words: invertebrate fauna, forest habitats, ecological reconstruction, Făgăraș Mountains

The Făgăraș Mountains area with the adjacent massifs, although it is included in two European areas of community interest - ROSCI0122 Fagaras Mountains and respectively ROSCI0381 Raul Târglui-Argeșel-Râușor - has suffered in the past and is still suffering in the present a major anthropogenic impact, with a palette that extends from the construction of hydroelectric dams to clear cuts and overgrazing. As a result of the anthropogenic impact of the last 150 years, forest and alpine habitats have undergone profound changes, which have led to the restructuring of both plant associations and invertebrate and vertebrate associations.

Currently, a number of areas from this region have entered an ecological reconstruction program, coordinated by the Foundation Conservation Carpathia, which aims to return to the natural types of forest and alpine habitats and establish them in the form of a National Park.

For five years, between 2019 and 2023, observations were made on the invertebrate fauna from the epigean layer in several types of habitats, included in the ecological reconstruction program, in some of which renaturation activities were carried out and others were left to renature naturally.

The resulting data allowed the identification of the trends of reconfiguration of the invertebrate fauna from the epigean layer in the habitats that suffered in the past from anthropogenic impact during the transition to natural habitats where anthropogenic impact is excluded and laid the foundations for a long-term monitoring program of the invertebrates from these habitats.

The invertebrate fauna of the epigean layer from different types of habitats in the Retezat National Park (Romania)

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Key words: invertebrate fauna, epigean layer, Retezat Mountains

The Retezat Mountains are one of the most important massifs in the Romanian Carpathians from a biodiversity point of view. The landscape is characterized by a large number of peaks over 2000 m, by the presence of numerous glacial lakes alternating with alpine meadows in a good state of preservation, and supports a mosaic of habitats. Characterized by a large number of endemic plants and animals, these habitats have been the subject of various studies in the 89 years since the park was established.

The first entomofaunal studies were carried out in the Gemenele Scientific Reserve area, more than 50 years ago. During 2022-2024, the invertebrate fauna of the epigeic layer was studied using the pitfall traps method, both in areas with forest-type habitats and in the areas of the alpine meadows located in the vicinity of the Gemenele, Tăul Negru, and Tăul Secat glacial lakes. We characterized the taxonomic groups and functional groups of invertebrates characteristic of different types of habitats and different levels of altitude, also highlighting the differences in recorded composition compared to older studies.

The role of riparian vegetation in structuring aquatic benthic invertebrate communities

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Key words: streams, riparian zones, benthic communities, land-use changes, local environmental context, woody vegetation.

Streams and their associated riparian zones comprise strongly linked systems that underpin landscape integrity. They are subject to multiple human uses, which affect biological diversity, cross-habitat linkages, and ecosystem services provision. Understanding the cross-ecosystem linkages and how they are affected by different human impacts and intensities have become a major issue in stream research and management.

This paper reveals the main patterns that characterize the structure and abundance of benthic invertebrates relative to the characteristics of streams associated riparian areas in catchments with varying land use intensities, from less disturbed conditions to those dominated by agriculture or a mixture of agriculture and urban land use.

The results demonstrate that variables of riparian areas' integrity play an essential role in shaping benthic invertebrate communities. The nearby woody riparian vegetation could mitigate the effects of different stressors resulting from anthropogenic pressures. However, stream ecosystem structure and functions are controlled by a hierarchy of nested biophysical processes operating at varying spatial scales.

Our results provide crucial insights into the role of woody riparian vegetation in shaping the macroinvertebrate communities under different impact intensities. They are instrumental in designing more effective management strategies to protect these critical freshwater ecosystems, the species that depend on them, and the vital freshwater ecosystem services they provide.

The influence of multiple stressors on shredding behavior of macroinvertebrates in stream ecosystems: the role of species richness

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Key words: multiple stressors, shredders, benthic macroinvertebrates, invasive species, species richness, feeding behavior.

Stream benthic macroinvertebrates, particularly shredders, play a crucial role in ecosystem processes such as organic matter decomposition and nutrient cycling. The complex interactions between multiple stressors, such as fine sediment accumulation and invasive plant species in adjacent riparian zones, can disrupt these processes, yet their effects on shredder behavior remain underexplored. This study examines the short-term impacts of two stressors — sediment accumulation and reduced leaf litter quality — on the feeding behavior of three benthic shredder species within a controlled microcosm experiment. Our results demonstrate that both individual and combined stressors influence shredding patterns, with species richness playing a critical role in modulating these effects. In monospecific assemblages, shredder identity primarily dictates the response, while in more diverse assemblages, species richness stabilizes the feeding function, mitigating the stressors' impact. Additionally, shredders exhibit a preference for native leaf litter over that of invasive origin, highlighting the importance of conserving native vegetation of stream-riparian systems. These findings underscore the significance of biodiversity in maintaining ecosystem functions and suggest that the effects of environmental stressors are context-dependent.

Benthic insect (Ephemeroptera, Plecoptera, Trichoptera, Coleoptera) larvae diversity from South and South-Western Romanian mountain streams

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Key words: benthic insect larvae, headwater streams, species inventory, anthropogenic ecological impact.

Insects' larvae are key components in the benthic invertebrate communities playing vital roles in the energy transfer processes from the organic matter compartment to higher trophic levels as fish or birds. Benthic insect larvae require different particle substrate sizes of either organic or inorganic origin as gravel, sand, silt or leaf packs, or need various types of flowing waters. Anthropic pressures like building small hydropower plants (SHPs) may govern the structure of these communities through direct and indirect habitat deterioration like flow and velocity alteration, sediment changes and microhabitat uniformization.

This study investigates, during spring and summer of 2019, the benthic insect larvae communities from 22 headwater streams from Argeș-Vedea, Olt, Jiu, Banat catchments. Sampling sites were located upstream and downstream of SHPs intake points, aiming to quantify spatial and temporal changes in the taxonomic composition of insect larvae communities and relating these to SHPs presence.

A total of 140 taxa were identified, 5 of which at subfamily and tribe level and the rest of them at the species and genus level. They belong to 5 orders (Ephemeroptera, Plecoptera, Trichoptera, Coleoptera and Diptera). Of the 140, 119 taxa were present in May-June and 117 in July-August. Within both sampling moments and all sampled stream sections, only two taxa scored as numerically dominant: *Acentrella sinainca* (27.2%) and *Baetis sp.* (12.5%), Ephemeroptera. In total 17 taxa had a relative abundance higher than 1%, comprising 84.7%. Generally, downstream of SHPs intakes, a lower number of taxonomic families was recorded compared to upstream sites, suggesting an anthropogenic impact on the composition of benthic insect community.

Updating the distribution of *Osmoderma barnabita* in Romania, with new locality records for the northeastern part of the country

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Key words: saproxylic beetle, hollow tree, Natura 2000, distribution, citizen science.

The hermit beetle *Osmoderma barnabita* is a threatened saproxylic species, considered an indicator for the species-richness of invertebrate fauna of hollow deciduous trees. It is part of the *Osmoderma eremita sensu lato* (a complex of several related and morphologically similar species), an important flagship and umbrella species whose conservation efforts has benefits for the preservation of both the habitat and co-occurring species. As such, *O. eremita* is included in Annex II of Bern Convention, Annexes II and IV of the EU Habitats Directive as a priority species for conservation due to its vulnerability to the loss of large veteran trees and habitat fragmentation. The species is also included in the Red Book of Invertebrates of Romania as vulnerable under the name of *Osmoderma barnabita*, the only species present in Romania. The species shows an obvious gap in its distribution in eastern Romania visible on several published maps. Good management practices for the habitats in which the species is present cannot be accomplished due to incomplete data on its distribution. In this presentation we prepared the most complex map containing the distribution of the species in Romania, from 1885 to present, including all known localities from old publications, online groups and online databases, museums and new field data for eastern Romania.

Movement ecology of Hermit beetles (*Osmoderma eremita*) in Eastern Romanian Carpathians

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Key words: animal tracking, saproxylic species, movement ecology, habitat selection.

Saproxylic beetles are fundamental components of forest ecosystems, contributing to nutrient cycling and decomposition processes, however, past Romanian forestry practices focused on reducing the presence of saproxylic species, as they were considered pests. Movement ecology can help protect saproxylic beetles by identifying the key habitat features that they require for movement and dispersal. For instance, saproxylic beetles might need particular types of deadwood, such as logs or snags, for feeding or breeding, or they may require specific microhabitats within deadwood, like decaying cavities. Understanding these needs enables the development of conservation measures that improve the protection and conservation of these species. Between 8 July and 29 August 2022, we monitored the movements of 28 Hermit beetles (*Osmoderma eremita* species-complex) using miniaturized VHF transmitters (Advanced Telemetry Systems T15). The research was conducted in an old-growth Beech Forest near Lepşa village in Vrancea county, southeastern Romania, situated on the right bank of the Putna River. The beetles were captured using flight intercept traps baited with Decalactone (Synergy Semiochemicals, Burnaby, Canada). Using homing radiotracking, we monitored individuals with transmitters three times a day, recording their position, behavior, and location. The results showed that the beetles moved between 6 and 405 meters (median = 21.43), with some remaining static or moving short distances. Individuals that remained in the same position typically moved vertically or stayed static in cavities.

Priority conservation areas for protected saproxylic beetles in Romania under current and future climate scenarios

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Key words: Climate change, saproxylic beetles, protected areas, spatial prioritization, Natura 2000.

Climate change is threatening species and ecosystems globally, including forest ecosystems, which harbor a rich invertebrate diversity. Saproxylic beetles, which rely on old trees and decaying wood, are increasingly under threat. As a result, conserving saproxylic beetles has become a priority for EU Member States. We developed ensemble species distribution models for five saproxylic beetles for current and three future time horizons under two Shared Socioeconomic Pathways and two Global Circulation Models. We then used a systematic conservation planning approach to assess the effectiveness and resilience to climate change of Romanian Natura 2000 network for saproxylic beetles while identifying future areas for protected area expansion to meet EU conservation targets. Our study revealed that under all scenarios and time horizons, the saproxylic beetles could lose over 80% of their suitable habitat and restrict their distribution to higher elevations. According to the conservation prioritization analysis, we found that when considering 30% of the landscape as protected, an average of 85% of species distribution is retained with priority areas overlapping the Carpathian Mountains, while for the current protected area coverage (18% of Romania's terrestrial area), the existing Natura 2000 network does not perform well, with only ~30% of the saproxylic species distributions falling inside the network. Our results corroborate other findings on saproxylic beetles range shift and contraction due to climate change; our results question the effectiveness of the current Natura 2000 network as it is currently insufficient for protecting these species. To achieve the goals of the EU Biodiversity Strategy 2030 of protecting at least 30% of the EU's land, we urge the expansion of the Natura 2000 sites to future suitable saproxylic beetle habitat.

Analysis of non-target beetle species collected on pheromone-baited adhesive panels in two oak stands infested with *Lymantria dispar* (Linnaeus, 1758) in southern Romania

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Key words: *Lymantria dispar*, non-target beetle species, pheromone-baited adhesive panels, oak stands.

This research aims to highlight non-target species of Coleoptera caught on adhesive panels used for monitoring the population of *Lymantria dispar*.

The experiments were carried out in two oak stands in southern Romania, aged 65-90 years old (Baba Ana; Tatina), during the adult *Lymantria dispar* flight season (June-August 2023), where the species produced outbreaks of varying intensities.

The installed panels were made from white polypropylene, one side of which was coated with adhesive, while the other side was baited with atraDISPAR, a sexual lure manufactured by the "Raluca Ripan" Institute of Chemistry Research-Cluj-Napoca, Romania. Twelve panels distributed randomly and split into three duplicates were mounted in each oak stand.

A total of 1844 specimens belonging to 20 non-target beetle species were collected. The 20 non-target species belonged to 11 families of Coleoptera, namely: Bostrichidae, Buprestidae, Ciidae, Cleridae, Curculionidae, Elateridae, Eucnemidae, Histeridae, Mordellidae, Ptinidae and Zopheridae. The species were classified according to their food preference, resulting in six categories (xylophagous, entomophagous, phytophagous, mycetophagous, xylo-mycetophagous, and saprophagous), with most species (11) being classified as xylophagous.

Among the 20 species caught, *Agrilus angustulus* and *Agrilus biguttatus* are thought to have a role in the phenomenon of oak decline in Western Europe. Additionally, *Platypus cylindrus*, *Xyleborinus saxesenii*, and *Scolytus multistriatus* can be vectors for pathogens that put the health of host trees at risk.

The total number of species (13 in Tatina and 12 in Baba Ana) did not significantly differ between the two forest stands, however there were notable differences in the total number of individuals (139 in Tatina and 1705 in Baba Ana). *Agrilus angustulus* was the most common species in Baba Ana forest, with 1628 specimens collected, whereas the majority of individuals in Tatina forest belonged to the species *Xyleborinus saxesenii* (55) and *Agrilus angustulus* (54).

A survey method based on adhesive panels may be developed in the future, as evidenced by the positive reaction to the capture method of several Coleoptera species that are thought to be secondary agents.

Distribution and diversity of fishes and lampreys in Transylvanian river systems

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Key words: conservation, fish distribution, freshwater ichthyofauna, Natura 2000, non-native species.

Freshwater fishes are in a serious state of decline across the world, making them one of the most threatened groups of vertebrates. The Danube River catchment area in Europe holds the richest freshwater fish community, but our knowledge of the current distribution of these species is limited. The rivers of Transylvania are significant tributaries of the Danube, with 77 fish species and two lamprey species recorded to date. Despite this large diversity of freshwater fishes, there is a lack of systematic survey for the past 50 years. We present data on the occurrence and distribution of fishes and lampreys collected between 2007-2022. We recorded 65 species of fish and three species of lampreys, and we also reported an additional nine species based on information from competent people. Of the 77 species recorded 19 (24.7%) are non-native, although their relative abundance was low (5.1%) compared to other similar regions in Europe. We present the first records of *Neogobius melanostomus*, *Piaractus brachypomus*, *Pygocentrus nattereri* and *Salvelinus alpinus* in Transylvanian rivers, the first record of *Cobitis elongata* outside the Nera River basin (from the Caraş River), and the detection of three new populations of the endangered *Umbra krameri*. We also provide data on changes in distribution that have occurred since the last comprehensive survey 50 years ago. We discuss the importance of our results in conservation planning, including the designation of new protected areas for freshwater bodies, and the compilation of the Romanian Red List of fishes.

Biotic interactions across time: conserved predator-prey dynamics shape species ranges

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Key words: character displacement, consumer, mosaic variation, prey-predator relationships, range shifts.

Understanding how biotic interactions influence species distributions across time and space is crucial for predicting species responses to environmental changes. We investigate the relationship between western spadefoot toads (*Spea bombifrons* and *Spea multiplicata*) and their prey, fairy shrimp (Crustacea: Anostraca), to examine the covariation of their range shifts in response to climate change oscillations and the implications for species distribution modeling. Using multiple modeling techniques, we estimated the potential distributions of these species across central and western North America under present-day and Last Glacial Maximum (LGM) conditions. We created a shrimp species richness map by aggregating individual species estimates and examined the relationship between spadefoot toad presence and fairy shrimp richness. Our results reveal that the same abiotic environmental variables shape the distributions of both spadefoot toads and fairy shrimp across time. Notably, areas of sympatry between *Spea bombifrons* and *Spea multiplicata* correspond with regions of dry conditions and higher shrimp richness. These predator-prey interactions exhibit spatial variability, forming a mosaic across the species' ranges. We conclude that incorporating biotic interactions, particularly in species with dietary specialization, is essential for accurate species distribution modeling. These interactions are likely conserved across geological time, making them valuable for projecting species distributions across different temporal scales. Our study underscores the importance of including biotic factors in ecological models to better understand and predict the dynamics of species distributions in response to environmental changes.

Thermal preferences of melanistic and patterned *Vipera* (*berus*) *nikolskii* under laboratory conditions

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Key words: thermoregulation, *Vipera*, melanism, colour polymorphism, thermal preferences, snakes.

Ectotherms are animals that have to rely on environmental heat sources to maintain their body temperatures within limits that allow for metabolic processes to take place normally. Reptiles, such as snakes, fall into this category and because of that they usually regulate their body temperature by basking in the sun or taking cover in shade, as necessary. Our work seeks to better understand how different colour morphs respond to environmental factors and how thermal preferences vary among the individuals within the same species. In this study, we designed an experiment where we simulated a basking situation, creating a temperature gradient within an enclosed space and observing the basking behaviour and thermal preferences of melanistic and patterned individuals. The individuals used in the experiment originated from two distinct populations, one polymorphic (where both patterned and melanistic individuals occur), and one monomorphic (where all adult individuals are melanistic). We found that on average melanistic individuals manage to keep a higher body temperature than the zigzag marked ones relative to the environment's temperature, vipers during the shedding process prefer cooler shadier spots and the average preferred temperature is higher in melanistic vipers than in non-melanistic individuals. Also, body-flattening as a heat absorbing strategy has been observed much more frequently in melanistic snakes than in non-melanistic snakes, being more than twice as frequent.

Patterns of road mortality in the Caspian whip snake (*Dolichophis caspius* Gmelin, 1758) in Romania

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Key words: road mortality, road ecology, species distribution model, habitat fragmentation, seasonal activity.

Roads are some of the most important human modifications of the natural landscape and they pose a serious threat to wildlife populations through habitat loss and degradation, disturbance, pollution (both chemical and light pollution), secondary development, barrier effect and, obviously, mortality caused by direct impact with vehicles. Amphibians and reptiles are especially affected and, coincidentally, they were among the earliest road casualties noted. Although snakes are especially prone to vehicular collisions due to certain characteristics such as elongated body and slow movement, this group is often overlooked in the field of road ecology.

Our study investigates the patterns of road mortality in the Caspian whip snake (*Dolichophis caspius*) in Romania, a frequent victim of road mortality. Our database, aggregated from original data, as well as on-line databases (GBIF, iNaturalist, Facebook groups) included 270 road-killed individuals, mostly adults, found predominantly on national and county roads. The analysis confirmed the existence of „hot moments", road-killed individuals being more frequent during May-June and September-October, periods associated with reproduction and hibernation. The developed ensemble model emphasized road sectors with high likelihood of vehicular collisions and stressed the importance of road density, terrain ruggedness and habitat configuration as predictors for the phenomenon. The information obtained is essential in optimizing management costs and guiding conservation efforts.

Spatial and environmental drivers of melanism in a widespread polymorphic snake species

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Key words: color polymorphism, melanism, climatic niche divergence, citizen science, viper, *Vipera berus*.

Wide ranging species typically occupy diverse climates, where alternative color phenotypes (morphs) may emerge as adaptations to local environmental conditions. This makes color polymorphic species excellent models for testing various ecological and evolutionary hypotheses, as coloration often reflects underlying differences in morphology, physiology, and behavior. Generally, morphs coexist within the range of a species, but they may also exhibit non-random distributions along environmental gradients, suggesting that different morphs have evolved to exploit distinct ecological niches. The common European adder (*Vipera berus*) is one such color polymorphic species, inhabiting a wide variety of habitats across an extensive range. It exhibits two distinct morphs: one with a typical dark zigzag pattern on a differently colored dorsal background, and another that is completely black (melanistic). In this study we investigate the patterns of geographical segregation between these color morphs and determine whether they occupy divergent climatic niches.

We compiled a dataset of crowdsourced, georeferenced photographs of *V. berus* and classified each snake as one of the two discrete color phenotypes (melanistic or zigzag). We then analyzed the geographical segregation of color morphs using exploratory point-pattern process analysis and quantified the similarities and differences between each morphs' climatic niche in both univariate and multivariate environmental spaces.

Our results reveal that while both morphs co-occur across much of the species' range, the melanistic morph becomes more prevalent towards the eastern parts of the distribution, particularly in Ukraine and southwestern Russia. Climatic niche analysis indicates that the melanistic morph is linked to areas that are relatively more arid, have lower annual mean temperatures, and exhibit slightly broader temperature ranges than those preferred by the zigzag morph.

Same color, same choice? Habitat use and activity patterns in melanistic vs. patterned vipers from monomorphic and polymorphic populations

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Key words: reptiles, snakes, coloration, adaptation, behavior.

Animal colorations represent adaptations to different biotic or abiotic environmental factors and play crucial roles in predator avoidance, inter- and intraspecific communication and sexual selection, or thermoregulation. In ectothermic animals, coloration may also be important for thermoregulation. Color polymorphism is present along numerous animal lineages, and melanism is probably the most studied type. In several Eurasian viper species of the genus *Vipera*, populations greatly vary with regards to the frequency of melanistic individuals, and the maintenance of polymorphism has been attributed to either adaptive or non-adaptive processes. Current theory would predict that melanistic vipers should be more frequent in colder environments (normally higher latitudes or altitudes), and this is mostly confirmed for the Asp Viper (*Vipera aspis*). For Adders (*Vipera berus* complex) however, the pattern is not as broadly supported, as numerous purely melanistic populations, or polymorphic populations with high frequency of melanic individuals, are present in warmer areas (lower altitudes and latitudes). Here we investigated habitat use and activity patterns in a polymorphic (with patterned and melanistic individuals) and a monomorphic (purely melanistic) population, in order to test whether said patterns could play a role in the maintenance of high melanism frequency in these warm environments, and whether melanistic individuals from different populations share similar preferences. While differences in habitat use between melanistic and patterned vipers were not evident, melanistic vipers from both the monomorphic and the polymorphic population were more prone to be active during cloudy and and rainy weather conditions compared to patterned vipers. This may have relevant adaptive implications for the evolution of purely melanistic populations, as it can lead to assortative mating, and therefore contributing to the maintenance of high frequency of melanic individuals, and, potentially to ecological speciation.

Assessment of the impact of natural and anthropogenic predators on ungulates in the Iron Gates Natural Park (Romania)

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Key words: ungulates, predators, dog, anthropogenic, disturbance, Parcul Natural Porțile de Fier.

The increase in the human population and the proportional decrease in natural habitats lead to the growth of interactions between wild species and humans. Our study took place in the Iron Gates Natural Park (Parcul Natural Porțile de Fier) in the Southern Carpathians, Romania, where the impact of human presence and stray dogs on the wildlife was studied. Between September 2020 and May 2023, we monitored feeding sites set up by hunting associations and nearby game trails using camera traps. Analyzing the data from the camera traps, we calculated the non-parametric activity overlap coefficient (Δ4) to estimate avoidance between natural predators, humans, stray dogs, and ungulate species. Additionally, we used a Two-species occupancy model to calculate occupancy interaction, occupancy interaction and detection, and Species Interaction Factor (SIF) values.

Our results showed that the daily activity patterns of ungulates, (*Cervus elaphus* and *Capreolus capreolus*) can overlap more with natural predators (*Canis lupus* and *Canis aureus*) than with anthropogenic predators (dogs) and humans, indicating that ungulates tend to move with natural predators away from non-natural predators. Based on our analyses, we found that the presence of natural predators has a moderate positive effect on the occurrence of ungulate species, with a higher probability of detection together, especially for red deer and wolf. On the other hand, the presence of humans and stray dogs negatively affects the occurrence of ungulate species and reduces detectability. Our results suggest that disturbance by humans and domestic stray dogs is more significant for ungulate species than disturbance by natural predators. In addition, it was found that disturbance caused by dogs is more important than human disturbance for red deer, while no significant difference in disturbance caused by dogs and humans was found for roe deer.

How a national emergency looks like. The curious case of the Carpathian brown bears

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Key words: brown bear, human-wildlife interactions, wildlife habitats, national policies.

Human-wildlife interactions (HWI) are increasingly common as human disturbance as development continues to remove wildlife habitats. Brown bears are one of the VIP species in the Northern hemisphere when the HWI topic arises. In this study, we apply a novel method for the evaluation of patterns of interactions by using publicly available data from emergency calls (EC). Between 2015-2020, the 112 Emergency Call Center registered 21,862 EC reporting interactions with a wild animal in urban (21%) or rural areas (79%). The brown bear was the second species reported (N=3122) summing 14,3% of the EC. Each EC data consisted of (1) species, (2) spatial location, (3) date and time, and (4) a short description of the emergency. We recorded an increasing trend in bears related EC over the 5 years period and we mapped the large-scale distribution and type of interactions to capture variations at the national level. The spatial distribution of interactions shows the existence of several "hot spot" areas in Romania, highlighting areas with frequent human-bear interactions. Further, we analyzed the social and the biophysical factors potentially influencing the occurrence and frequency of interactions. The results showed that social factors have the same effect on all species, while the effect of the biophysical factors varied between species. As a response to a high level of HWI, the national authorities included the bear in the list of high risks for people's safety and proposed an "intervention protocol". During 2021-2023, according to the EPA reports the authorities were called to intervene in 1415 cases and 69 bears were shot during the emergency interventions. We consider that extrapolating the socio-ecological context of these "emergency hot spot" areas to the national level and developing national policies based on these examples is neither justified nor useful to build up human-bear coexistence.

Feather mite collection (Acarina, Analgoidea) of "Grigore Antipa" National Museum of Natural History

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Key words: bird ectoparasites, feather mites, Analgoidea, museum collection, new species.

Feather mites (Acarina: Analgoidea) are commensals that permanently live in the plumage and on the skin of birds. The Feather mites collection of the "Grigore Antipa" Museum was initiated by our team, having as a goal to study birds ectoparasites (feather mites and chewing lice).

The collection currently includes over 40 000 specimens of feather mites that have been identified and preserved either as slides or in alcohol and is relatively young, being initiated in 2012. The first specimens that have been included in the collection in the first year of study come from Romania (especially Danube Delta). Most of the acarological material studied was collected in the next years by the research team from Asia (India and China) and Africa (Morocco), in a series of scientific expeditions that were organised by the Grigore Antipa Museum: "Dakhla - 2012", "Merzouga - 2013" (Morocco), "Khahnar - 2013", "Shnongrim - 2014", "Kharkhana - 2014" (India), "China - 2019".

The collection includes 41 holotypes of feather mite species that were described by us between 2013-2024, and that were published in 22 scientific papers. A number of other 20 paratypes with species described from Brazil were received in our collection through an exchange of acarological material. Valuable acarological material was obtained from the birds collection of "Grigore Antipa" Museum either dry specimens (museum skins) or birds preserved in alcohol. For example, 3 new species of feather mites of the genus *Proterothrix* have recently been described from some old specimens of birds of paradise (over 100 years old). From some birds collected in the expedition organised in 1991 by "Grigore Antipa" Museum in Indonesian Archipelago, have been identified and described 4 new species of feather mites. This highlights the scientific importance of the collections, which can be studied and exploited even after long periods of time.

At this moment Acarina (Analgoidea) collection includes material from 4 continents (Europe, Asia, South America, Africa), respectively from 15 countries, being one of the representative collections of feather mites worldwide.

POSTER PRESENTATIONS

First record of prehistoric mud dauber wasps nest in Moldova, Romania

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Key words: mud dauber wasp, prehistoric nest, Eneolithic, Moldova, *Sceliphron*.

Surface surveys and geophysical investigations of the *Topolița - North-west of the village* site (Grumăzești, Neamț county) revealed substantial archaeological remains, with the richest archaeological evidence belonging to the Eneolithic period, specifically the Precucuteni culture (5th millennium BC). The site is represented by the remains of several burned dwellings, household pits, and hearths, along with numerous artifacts. During the archaeological campaign of 2021 carried out at the archaeological site of Topolița, a large sized dwelling (6 x 10 m) noted L.3, was investigated. Among the burnt remains, it included broken pots, stone tools and anthropomorphic representations modeled in clay. Among the more remarkable objects discovered inside this dwelling, in its north-western part, was a fragment of a mud wasp nest, identified at a depth of 0.70 m, at the top of the burnt wall remains.

Mud-nesting wasps are solitary aculeate wasps found in all main biogeographical regions of the world, building their nests often in close association with human dwellings. The nest fragment collected from the Topolița site was identified as belonging to the *Sceliphron* wasp genus. The nests of these species are composed of clusters of several tubular brood cells, each a few centimeters long, where the female mud dauber wasp stores prey and lays eggs. Wasps gather material for their nests from surrounding areas, mud collected by female wasps containing sand, clay, surface sediments and a variety of organic materials. The nests become petrified after abandonment.

The mud wasp nests at the Topolița site provide evidence that structures or surfaces were present in the environment during the time of nest construction, indicating human habitation or natural formations that offered suitable conditions for wasp activity. This type of prehistoric mud dauber nest shows also that such a nesting strategy has been a successful and long-lasting evolutionary adaptation, unchanged for thousands of years.

This present discovery is, to the best of our knowledge, the first documented fragment of mud dauber nests recovered from a Moldavian archaeological site in Romania and likely one of the few such finds in Europe.

Glinoye - a new location of Late Neogene vertebrate fossils on the left bank of the Dniester River

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Key words: fossil fauna, Glinoye, Kherson, Meotian, Late Neogene.

The site of the fossil fauna is located 1.3 km south of the village of Glinoye, Grigoriopol district (47˚12′25″N, 29˚25′00″E). Rock outcrops containing fossil vertebrate remains are confined to the middle part of the gully located on the left side of the Glikskaya gully. Bone remains of large mammals were first collected by N. Romanovich.

Here in a small gully at an absolute level of +75 m, a sandy-clayey stratum up to 10 m thick with a pack of clayey gravel in the upper part of the section is exposed. The lower part of the visible section is represented by fine fine-grained oblique sand. The fine-grained sands are overlain by a small thickness of clayey interbedded gravels containing vertebrate fossils.

In geological terms, the location of the Glinoye fossil fauna is confined to the area of undivided clay-sand deposits of the Kherson and Meotian regions of the Late Neogene of the Dniester-Prut interfluve.

According to preliminary data, the fossil vertebrate fauna from the Glinoye locality is represented by remains of Hyaenidae, Rhinocerothidae, *Hipparion* sp. and shell fragments of several turtle species.

Additional field and laboratory studies are required to clarify the age of the Glinoye site sediments, its stratigraphy and species composition of the fossil fauna.

Applications of IRMS technology in paleodiet reconstruction using bone collagen

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Key words: IRMS, bone collagen, $\delta^{13}C$, $\delta^{15}N$, paleodiet.

Isotope ratio mass spectrometry (IRMS) is a technology that has advanced the field of archeology through paleodiet reconstruction, allowing for a better understanding of feeding behaviors over time. This analytical technique has become increasingly accessible (a good price-performance ratio), extending its applications beyond the traditional domains of geology and geochemistry. The applications of IRMS in bioarchaeology are not limited to food analysis, as it also provides vital information about ancient societies' environmental conditions, migration patterns and social connections.

Reconstructing the diets of past populations is crucial for anthropological and archeological research. Therefore, by studying the stable carbon and nitrogen isotopes in bone collagen, scientists can reveal specific details about the types of foods ingested and trophic connections within previous ecosystems. The ratio of stable isotopes of carbon ($\delta^{13}C$) reflects the source of dietary protein, such as in marine and terrestrial plants, and meat, whereas the stable isotopes of nitrogen ($\delta^{15}N$) reveal an individual's position in the food chain (Bocherens et al., 1991).

The combination of these isotopic analyses of bone collagen with classical archaeological information allows researchers to understand the intricacies of human and animal diets over time.

In Romania, the use of this method is quite new and Romania's lack of isotopic data is a major obstacle to the interpretation of past diets and ecological relationships and emphasizes the need for more investment in this domain.

In this study, we aim to bring new isotopic information from nine domestic mammalian bones (3 *Bos taurus*, 3 *Sus domesticus* and 3 *Ovis aries*) from a neolithic site from Southeastern Romania (Dobrogea), compare them with a similar site (from Cheia settlement) and investigate the broader context of these findings.

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Paleoecology and extinction of large mammals from Isotopic Stages 3-1 of the Romanian Carpathians (and beyond): an integrative approach (INTEGRATE) — Preliminary results —

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Key words: *Ursus spelaeus*, stable isotopes, microwear analyses, radiocarbon, palaeoecology, Late Pleistocene.

Previous research on the extinct Marine Isotope Stage 3-1 (Late Pleistocene-Holocene) fauna attempted to decipher the species’ responses to environmental change through isotopic studies and palaeodietary reconstructions. Although significant progress was made, the palaeoecology and the causes of extinction for many Late Pleistocene species remain to be addressed.

During the INTEGRATE project we generated a wealth of novel data focused on MIS 3 cave bear (*Ursus spelaeus*) sites that are particularly abundant in Eastern Europe. These include: 1) 3D models for 65 cave bear mandibles obtained using photogrammetry; 2) microwear data of the lower carnassials (m1) for cave bears and associated fauna from: Bulgaria (N=127 specimens), Republic of Moldova (N=117), Serbia (N=54) and Romania (N=289); 3) 2D size and shape geometric-morphometric data for 100 cave bear molars from different fossil locations across Romania; 4) osteometric analyses for over 300 cave bear specimens; 5) $\delta^{13}C$ and $\delta^{15}N$ stable isotope analyses for over 300 bone samples (cave bear and associated fauna); 6) $\delta^{13}C$ and $\delta^{18}O$ serial sampling for cave bear canines (N=6); 7) $\delta^{13}C$ and $\delta^{18}O$ isotopic data for ca. 100 cave bear mandibles; 8) $\delta^{44/42}Ca$ analyses for N=88 samples (cave bear and associated fauna); 9) radiocarbon dating for 41 samples (cave bear and associated fauna); and 10) *mt*DNA analyses for *ca*. 12 samples (cave bears and wolves). Such an extensive dataset provided unprecedented insights into both population dynamics and supposedly related drastic palaeoecological constraints in the context of MIS 3-1 rapid climatic changes. Cave bears show remarkable phenotypic changes in relation to climate changes and the isotopic signature of associated fauna equally follows an ecological pattern of habitat tracking. Dating suggests disappearance of cave bear post 27 ka possibly related to disappearance of key habitats, genetic depletion, predation, competition with humans, climate shifts and other possible causes (*e.g.*, vulcanism).

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Suidae (Mammalia, Artiodactyla) from the Early Pliocene locality Priozernoe in the Dniester Valley

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Key words: Early Pliocene, Priozernoe, biozone MN 14b-15a, Suidae, *Potamochoerus provincialis*, *Dasychoerus arvernensis*.

The Early Pliocene of the Dniester-Prut interfluve is characterised by two species of the family Suidae: *Potamochoerus provincialis* (Blainville, 1847) and the smaller species *Dasychoerus arvernensis* (Croizet, Jobert, 1828). These species are characteristic representatives of the Kuchurganian and Moldavian vertebrate faunal complexes (biozones MN 14-15).

Finds of remains of *Potamochoerus provincialis* are known from the Lucheshty, Pelinei and Nikolskoe localities (Zakharov & Tchepalyga, 2012; Marareskul, 2015; Picford & Obada, 2015). *Dasychoerus arvernensis* is known from Musaid and Dermendji localities (Picford & Obada, 2015).

In the period from 2011-2023, the author collected fossil remains belonging to two species of Suidae from the Early Pliocene locality of Priozernoe (biozone MN 14b-15a). The material is represented by two isolated teeth and a whole metacarpal bone. Based on morphometric and morphological characters, the following were assigned to the species *Potamochoerus provincialis*: lower left molar – m2 sin (length – 25.0 mm; width – 16.5 mm) and upper left premolar – P3 sin (length – 15.2 mm; width – 13.4 mm). The right fourth metacarpus – mcIV dex (length – 68.6 mm; proximal breadth – 14.1 mm / proximal height – 12.0 mm; distal breadth – 14.4 mm / distal height – 14.3; diaphysis breadth – 13.1 / diaphysis height – 9.5) was assigned to another species of Suidae. This specimen is very similar to the fourth metacarpus – mcIV sin from Dermenji (measurements respectively: 66.6 mm; 15.3 mm / 12.2 mm; >13.2 mm / >12.0; 12.1 / 9.1). Both metacarpals are small in size and belong to the smaller Suidae species. Due to the lack of comparative material on IV metacarpal bones of *P. provincialis* and *D. arvernensis*, it is possible to determine these specimens only to the family Suidae Gray, 1821.

Thus, two species of Suidae were determined from Priozernoe: *P. provincialis* and a smaller species – Suidae gen.

This study was performed within the subprogram no. 010701 and within the doctoral project "Fossil fauna complexes and the evolution of vertebrate fauna in the early stages of the formation of the Dniester Valley (Pliocene-Early Pleistocene)".

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Priozernoe - largest Early Pliocene locality remains of primates of the genus *Dolichopithecus* (Colobidae, Primates) in the Northern Black Sea region

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Key words: Early Pliocene, Priozernoe, biozone MN 14b-15a, Primates, Colobidae, *Dolichopithecus ruscinensis*.

The Priozernoe locality was discovered by A. Tchepalyga and D. Zakharov in 2007. It is located 20 km south-east of Tiraspol at the northern outskirts of the village of the same name, where the thickness of the Early Pliocene sediments of the Kuchurgan River, a left tributary of the Dniester, was uncovered (Tchepalyga et al., 2011). The vertebrate fauna from the Priozernoe has more than 70 taxa and correlates with of the 14b - 15a Meine biozones (Zakharov, 2023).

Finds of primate fossils in the region are extremely rare. Single specimens of monkeys of the genus *Dolichopithecus* are known from several Pliocene localities (Novopetrovka, Voynichevo, Tsebrikovo, Budey, Musaid), and one Early Pleistocene (Kotlovina) (Mashchenko & Marareskul, 2010).

During the field season in the summer of 2008, in the scree on the slopes of the quarry near the village of Priozernoe, the author found the right milk incisor – id2 and a fragment of the ulna, previously attributed to a monkey of the genus *Dolichopithecus*. In 2009, V. Marareskul discovered a fragment of the lower mandible of a young specimen of *Dolichopithecus* sp., ♂ (Mashchenko & Marareskul, 2011). In the period from 2014-2023, the author found the following remains: a fragment of the lower mandible from m1-m2 of a female identified as *D. ruscinensis*, ♀; a fragment of the lower mandible from p3-m3 belonging to a large male *D.* cf. *ruscinensis*, ♂; the lower right molar – m3 dex and the lower right canine – c1 dex, defined to the species *D. ruscinensis*, as well as 2 fragments of teeth that are only definable to the genus.

The number of primate remains found in Priozernoe totals 9 samples, which makes this location the most representative in terms of the number of remains belonging to monkeys of the genus *Dolichopithecus* in the Northern Black Sea region.

This study was performed within the subprogram no. 010701 and within the doctoral project "Fossil fauna complexes and the evolution of vertebrate fauna in the early stages of the formation of the Dniester Valley (Pliocene-Early Pleistocene)".

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Cornu aspersum (Gastropoda, Helicidae) presence in Romania confirmed in the wild

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Key words: terrestrial snails, allochthonous species, introduced species.

Cornu aspersum, also known as the European garden snail or the brown garden snail, is a helicid species with a native Mediterranean distribution. As it is highly appreciated for its taste mostly in Mediterranean countries, this species has been farm-raised for economic reasons. It is not native to Romania, but there have been attempts to introduce it in snail farms in the past. These attempts failed, as the snails could not adapt to the winter conditions in Romania fast enough.

What seems to be a healthy multi-generational population was found on the Ovidiu Island located in the Siutghiol Lake, on the Black Sea littoral, in April 2023. This island is relatively isolated, accessible only by boat, and highly anthropic. Also, the weather conditions in the region are influenced by the proximity to the Black Sea, with less harsh winter conditions than the rest of the country. The *C. aspersum* snails observed here seem to be forming a stable population, the species having most likely been accidentally introduced along with some type of plants.

Five adult snails were collected by hand in July 2023 from Ovidiu Island and preserved in 96% ethanol. For identification, both morphological and genetic approaches were used. The shape, dimension, colour and pattern of the shell clearly indicated the *Cornu aspersum* species. The species identity was confirmed by DNA-barcoding, using a 593 bp-long COI fragment. The search was performed against the NCBI and BOLD nucleotide databases and at least 10 significant matches were identified, with high similarity scores of up to 99.63%.

So far, *C. aspersum* seems to be thriving on this small island, but it might be affected by harsher winters in the future. This population needs to be closely monitored, as there is the possibility that some individuals could be transported through human-mediated dispersal vectors, potentially establishing new populations outside their current location.

Diversity of fish helminths in the river Mtkvari (Georgia)

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Key words: Caucasus, freshwater river, fishes, helminths.

The Mtkvari (Kura) River is the largest river in the Caucasus, which flows through the territory of several countries (Georgia, Azerbaijan, Turkey). Most of the fishes are of commercial importance. They play a very significant role in the diet of the population of the towns and villages located on its banks. In recent decades, systematic parasitological studies of fishes of the Mtkvari River have not been conducted in Georgia. For the purpose of parasitological examination of fishes, the research material was collected from five study areas (Aspindza, Borjomi, Khashuri, Tbilisi and Gardabani) of the Mtkvari river dynamically, according to the seasons in 2021-2024. 145 specimens of 16 species of fish - *Silurus glanis*, *Carassius gibelio*, *Luciobarbus mursa*, *Capoeta capoeta*, *Pseudorasbora parva*, *Squalius agdamicus*, *Ponticola cyrius*, *Alburnoides eichwaldii*, *Alburnus filippii*, *Acanthobrama microlepis*, *Alburnus chalcoides*, *Hemiculter leucisculus*, *Barbus cyri*, *Neogobius fluviatilis*, *Gobio caucasicus* and *Luciobarbus capito* were examined; 100 (68,9 %) of them were infected. 11 species from five taxonomic groups of helminth parasites were identified: *Ancyrocephalus* sp., *Dactylogyrus* sp., *Gyrodactylus* sp., *Paradiplozoon* sp. (Monogenea), *Diplostomum* sp., *Tylodelphys* sp., *Posthodiplostomum* sp. (Trematoda), *Diphyllobothrium* sp. (Cestoda), *Porphorhynchus* sp., *Neochinorhynchus* sp. (Acanthocephala), *Rhabdochona* sp. (Nematoda). Among the examined fish species, infestation of *Alburnoides eichwaldii* was 97,2%. The dominant parasite species was *Paradiplozoon* sp., which was observed in six species of fish. The results obtained so far clearly show that the helminth fauna of Mtkvari fish needs further research, which will be an important step for the modern assessment of the diversity of the helminth fauna of Georgian fishes.

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The occurrence of gastrointestinal helminths of small mammals in some geographical areas of Georgia

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Key words: small mammals, gastrointestinal helminths, geographical area, Georgia

Diversity of landscape zones and the associated range of features areas reflected in the helminth fauna of the micromammals. Our research aim was to investigate gastrointestinal helminths of micromammals in the previously parasitological unexplored landscape zones of Georgia. The material was processed using methods generally accepted in helminthology. Based on morphological and morphometric parameters the species of helminths was determined. In October 2022 – 2023 in the vicinity of Koda (Tetritskaro municipality) in the steppe zone Asia Minor gerbils (*Meriones tristrami*) (n=3) were examined. In the section of the large intestine were recorded the nematodes *Trichocephalus muris* and *Syphacia sp.*; the prevalence of infestation was 66.6 %. In the vicinity of Lake Madatapa and the village of Gilhidak on the Javakheti Volcanic plateau (Ninotsminda municipality) in the zone of mountain steppe and subalps were not found gastrointestinal helminths in weasels (*Mustela nivalis*) (n=4). In May 2024, in the vicinity of Dedoplistskaro in the zone of secondary steppe and forest plantations, as well as in the zone of mountain steppe and subalps *M. nivalis* was not infected, however in the large intestine of gray hamster (*Cricetulus migratorius*) was found nematodes *Syphacia sp.* In Georgia, study of helminth fauna of *M. tristrami* was carried out for the first time. Within our research *M. tristrami* were found to be infected with nematodes *T. muris* and *Syphacia* sp. In the vicinity of Dedoplistskaro, *C. migratorius* were infected with nematodes of genus *Syphacia* with low intensity. The obtained data indicate a poor helminth fauna of gastrointestinal helminths micromammals in the studied areas and is represented only by geohelminths. Thus, the formation of the helminth fauna of small mammals depends on the natural and climatic conditions of landscape zones and the characteristics of the ecosystem of each specific geographic area.

Caught in the web: three new crawly records for the Romanian Arachnofauna found at South-Eastern part of Romania

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Key words: faunistics, spider (Aranea), new record, South-Eastern part of Romania.

In the present work, three new spider (Aranea) records are presented as new faunistic elements for Romania: *Maimuna vestita* (C. L. Koch, 1841), *Leptodrassus albidus* Simon, 1914, and *Saitis tauricus* Kulczyński, 1904, from three families: Agelenidae, Gnaphosidae, Salticidae. This is also the first time when these three new genera are recorded in our country.

We want to highlight the need of more arachnological field work in different regions in Romania, pointing out the opportunity to discover new species for the country and to have a more complete data about the Romanian spiders, working towards an up-to-date Catalogue of Spiders from Romania, the last one being updated in 2000 containing 972 species, but since then numerous works attest the presence of new genera and species on the territory of Romania. Also, based on the distribution, many species, including the species mentioned here *S. tauricus*, should also be present in the Republic of Moldova, which leads to a second role of our work, namely the necessity of arachnological studies in the Republic, which was deprived of a particular faunistic study and which can be full of surprises.

Trachelipus razzautii (Arcangeli, 1913) and *Typhloiulus serborum* Ćurčić & Makarov, 2005 – new species of Oniscidea and Diplopoda for the Romanian fauna

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Key words: new records, Oniscidea, Diplopoda, Romania.

Biological collections have a significant role in fields at the forefront of biological sciences as cornerstones in biodiversity and the prominence of references to biological collections in peer reviewed publications is a testimony of their contribution to scientific knowledge. However, the importance of scientific collections is underappreciated by the public and by the policymakers, resulting in insufficient financial support for their maintenance and improvement (Suarez & Tsutsui, 2004).

Scientific collections are essential for taxonomic work by providing raw data: as centralized storehouses of reference material, acting as sites of accumulated knowledge and resources, sometimes diminishing the need for costly fieldwork (Suarez & Tsutsui, 2004) and providing unexpected discoveries.

Two such discoveries are the finding, for the first time in Romania, of *Trachelipus razzauti* (collected in Dobrogea in 1964) and *Typhloiulus serborum* (collected from Oltenia and Banat, in the period between 1956 and 1965).

Up to the present, *Tr. razzauti* was known from Northern Italy, Switzerland, Slovenia, Greece, Turkey, Bulgaria, Russia (Vilisics et al., 2012; Schmalfuss & Khisametdinova, 2015) while *Ty. serborum* was considered as endemic for Serbia (Ćurčić et al., 2005).

Both species have been "discovered" in the collection of the "Emil Racoviţă" Institute of Speleology. A part of this collection, began by professors Orghidan and Dumitrescu, and continued by drs. I. Tabacaru, Ştefan and Alexandrina Negrea, M. Georgescu, M. Gruia, I. Căpuşe, D. L. Danielopol, V. Decu, D. Dancau, E. Nitzu and many others, is still not identified to the species level and as the two species clearly show can provide significant developments.

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The parasitic louse faunas of China and Sweden (Phthiraptera)

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Key words: Phthiraptera, biodiversity, museum studies.

Our knowledge of the louse fauna in different parts of the world is often patchy. Few countries have ever had long-term research programs dedicated to surveying of chewing lice, least of all countries outside Europe and North America. As a result, the geographic range of many lice is imperfectly known. Moreover, lice are often identified based on host associations, and existing museum specimens may be unpublished and uncatalogued, thus underestimating regional diversity estimates and geographical ranges. In recent years, we have examined museum collections in Sweden and China, during work with national checklists of these countries. In Sweden, through fresh collections and studies of unpublished specimens at the Natural History Museum, Stockholm, we increased the known fauna from 204 species in 76 genera, to 332 species in 88 genera, an increase of ~63%. In China, studies in the National Natural History Museum of China, Beijing, led to an increase from 180 species in 56 genera, to 257 species in 68 genera, an increase of ~43%. However, for the Chinese collections only the Ischnocera have so far been identified, and almost half of the museum's collection is still unpublished. Moreover, 92 of the 180 (51.1%) species previously known from China are based on our fresh collections during 2017–2023, meaning that our combined museum and field work has increased the known diversity by 192%. Despite this, we estimate that >80% of the true diversity of Sweden and >94% of the diversity in China is still unknown. Discovering the true diversity of these countries will require more field collections, but studies of specimens in extant museum collections may go a long way towards recording lice on hosts that are rare or difficult to catch. Critical museum studies of lice are sorely needed, not least for collections from Asian and African countries.

Morphology informs biogeography in chewing lice (Phthiraptera, Ischnocera) parasitizing gamefowl (Aves, Galliformes)

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Key words: Phthiraptera, Ischnocera, biogeography, altitude, Galliformes, morphology.

Most ischnoceran lice parasitizing galliform hosts have traditionally been considered to comprise a small number of morphologically heterogeneous genera (*Goniodes, Goniocotes, Lipeurus, Oxylipeurus*). These broad definitions of genera undeniably mask substantial amounts of morphological variation within each genus, and alternative classifications that divide each genus into smaller groups have been proposed. Following extensive revisions and redescriptions in these louse genera, we examined the distribution of lice, both using broader and narrower definitions of each genus. The broader definitions imply that all four genera are global in range, and have little predictive value. The narrower definitions, which increase the number of genera from 4 to 39, have helped reveal patterns in host associations and biogeography. Many of the smaller genera appear to be limited to single host genera or clades, for instance the many genera exclusively found on megapodiid hosts. However, host associations do not explain all the apparent patterns. Several genera are limited to very high-altitude hosts, whereas others appear to be limited to hosts of different groups occurring in drier environments. In both cases, the specialized groups may cut across different, distantly related host groups, indicating that host-switching within an environment may be an important factor in galliform louse evolution. On a larger scale, there are clear divisions between New World and Old World faunas of galliform hosts, and in at least *Goniodes* s. lat. and *Oxylipeurus* s. lat. the centers of diversity appear to be Southeast Asia. Moreover, a large number of previously unrecognized morphological groups have been found, many of which have already been described. More revisions are needed to separate lice on galliform hosts into smaller genera, supported by both genetic and morphological data, particularly as many species have never been adequately described or illustrated.

Meconema meridionale (Orthoptera, Tettigoniidae) a new uninvited guest to Romanian Fauna

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Key words: oak bush-crickets, areal expansion, invasive species, highway routes.

Species that expand their distribution range are documented more often. These expansions can be driven by various factors, including environmental changes, availability of resources, and human activities (Blackburn et al. 2014). *Meconema meridionale* Costa, 1860 (Orthoptera: Tettigoniidae), or the Southern oak bush-cricket, is one such species. Its native range is a limited area in northern Italy, Croatia, and southern France (Vlk et al. 2012). Following climate change, it has expanded its distribution northward, but this range expansion has been further facilitated by humans through major traffic routes (Vlk et al. 2012). The Southern oak bush-cricket has thus been introduced to numerous countries in Europe, reaching as far as Germany and Poland to the north and Hungary and Slovakia to the east (Cigliano et al. 2024). It has been documented as forming stable populations in the tree canopy in urban habitats (Essl and Zuna-Kratky, 2021). In Romania, the species was reported for the first time last year through social media sites dedicated to citizen science.

The aim of our study was to investigate the distribution of the species in Romania as well as its genetic diversity and to identify the sources of the populations established in the country. We identified the species in three different localities and we collected samples. Genomic DNA was extracted and a fragment of the mitochondrial gene COI was amplified for DNA barcoding and genetic variability analyses. The obtained sequences were compared with sequences deposited in online databases. Of the six sequences analyzed from Romania, five grouped together with samples from Germany in one single haplotype. A sixth sequence belongs to a private haplotype that is five mutations away from the first haplotype. In terms of the origin of *Meconema* individuals from Romania, we can say that the species entered our country from two different sources, but due to the small number of samples and the lack of sequences from the area of origin of the species (northern Mediterranean), the original source of the identified individuals cannot be determined. Further investigation is needed to answer the questions regarding the spread of the species in Europe.

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New additions and further records of non-native Coleoptera in Romania

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Key words: beetles, biodiversity, faunistic record, synanthropic species.

In an increasingly globalized world, where non-native species are currently introduced at an unprecedented rate, the continuous updating of non-native species occurrences is a key step in understanding their introduction and spreading trends.

This report details the discovery of five new non-native coleoptera species from the Romanian fauna: *Cis chinensis* Lawrence, 1991; *Latheticus oryzae* C.O. Waterhouse, 1880; *Palorus subdepressus* (Wollaston, 1864); *Tribolium destructor* Uyttenboogaart, 1933; and *Litargus balteatus* LeConte, 1856. Furthermore, the distribution of a further 19 species labeled "data deficient" was updated. The identification of the new species in a natural setting indicates that they are well-established and warrant further monitoring to determine their current distribution at the national level and potential impact on the environment and human activities. This indicates the current extent of our understanding of the diversity of non-native coleopterans in Romania and emphasizes the necessity of further investigation into this group, with a particular focus on those species with the potential to become invasive.

Contributions to the knowledge of Lepidoptera from Northern Dobrogea

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Key words: Lepidoptera, butterflies, moths, monitoring, protected species, Dobrogea

Lepidoptera is an important group of insects, functioning as essential pollinators in wild habitats and in some cases representing agricultural pests. Monitoring wildlife is crucial in evaluating human impact on nature and although in Dobrogea there are a lot of faunistic records concerning butterflies, few studies were done in a systematic way. Our study focuses on the investigation of lepidopterans from four areas in Northern Dobrogea, namely the Ciuperca Lake in Tulcea, the Somova Hills, the fields near the Sarica Hill and the dam near the Bălteni de Sus village, during July-September of 2023. The observations also included some behavioral aspects.

The method used was the Pollard Walk, which implies traveling across each transect during favorable conditions while making observations. Each species of butterfly or moth was photographed on the vegetation or captured with an entomological net and subsequently identified at species level.

58 species of butterflies and day-flying moths belonging to 11 families were reported, three of them being protected: *Lycaena dispar* (Haworth, 1802) and *Cupido alcetas* (Hoffmannsegg, 1804) from Fam. Lycaenidae and *Neptis sappho* Pallas, 1771 from Fam. Nymphalidae. Abundance and specific richness in relation with the environment conditions are presented, as well as the Jaccard index to compare the four transects. In all cases the site least affected by human activities (Bălteni) turned out to be the richest in observations, while the site situated directly in the city, Ciuperca, has the lowest values. The study also describes aspects related to the ethology of the insects, like mating dances, mating itself, taking up salts through puddling, the preferred flowers, and also intra- and interspecies interactions.

Dobrogea has a complex Lepidoptera fauna, and more studies are needed to be fully understood. The present contribution allows us to expand the knowledge about the Lepidoptera in this area.

The return of two Mediterranean species - *Leptotes pirithous* (Linnaeus, 1767) and *Lampides boeticus* (Linnaeus, 1767) (Lepidoptera, Lycaenidae) in Dobrogea

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Key words: Mediterranean butterflies, climate changes.

Leptotes pirithous and *Lampides boeticus* are two species that are characterized by the ability to expand their range in the last 20 years not only to the North, and this trend can be put in connection with the current climate changes. About 40 years ago, these species were occasionally found in Romania, usually during hot summers.

A few years ago, as a result of the general trend of climate warming, both species developed stable populations in Dobrogea. The populations in question were observed in several successive years, until a winter in which the temperatures dropped suddenly determined their disappearance.

This year, in very special thermal conditions, both species appeared in large numbers in the south of the Romanian coast, between Techirghiol and Mangalia.

Isolated specimens of *Leptotes pirithous* were identified in semi-anthropized habitats in the area of Techirgiol in July 2024, while dozens of specimens of *Lampides boeticus* were observed in Techirghiol and in Mangalia, depositing eggs, in August 2024.

The presence of a significant number of specimens of both species demonstrates their ability to adapt, as well as to expand their range when the environmental conditions are favorable. In the current period, marked by global climate warming, this situation can only be added to the list of observations that attest to the ability of some species to expand their range, contributing to the diversification of the structure of the local fauna.

Presence and population dynamics of the vine bud moth *Theresimima ampellophaga* (Bayle-Barelle, 1808) in Dealu Mare Vineyard (Romania)

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Key words: *Theresimima ampellophaga*, monitoring, sex pheromone, Dealu Mare Vieneyard, Romania.

The vine bud moth *Theresimima ampelophaga* (Bayle-Barelle, 1808) (Lepidoptera: Zygaenidae, Procridinae) is an invasive species of the Lepidoptera which damage the grapevine in Southern Europe. In Romania, it was identified in 1895 (Caradja, 1895) in the vineyards of the west and east of the country.

In this study, we follow the presence and population dynamics of *T. ampellophaga* in Dealu Mare Vineyard situated on the Southern Subcarpathian hills. The monitoring activities were carried out during the growing season from May to September 2024, on six vineyard plots distributed in four viticultural centres, Valea Calugareasca, Urlati, Ceptura and Breaza, including local and international grape varieties such as Feteasca alba, Chardonnay, Merlot and Pinot Noir. Delta sticky traps baited with the synthetic sex pheromone of *T. ampellophaga* (Subchev et al., 1998) were used to detect and monitor this species.

Our results confirmed the presence with variable abundance of *T. ampellophaga* in all six monitored vine plots from Dealu Mare Vineyard.

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GBIF occurrence data for Red Book predatory birds in the Republic of Moldova

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Key words: GBIF, predatory birds, occurrence dataset, Red Book, Republic of Moldova.

GBIF (Global Biodiversity Information Facility) is an international biodiversity database that integrates more than two billion worldwide species occurrences. In our study we aimed to obtain and analyze a GBIF dataset (GBIF.org, 2024) regarding the occurrence of Red Book predatory birds on the territory of the Republic of Moldova from 2015 untill 2024. The query referred to all species of predatory birds included in the last edition of Moldavian Red Book (23 species) and was carried out using the *R* language and the *rgbif* package.

Thus, 2374 observations that refer to 15 species from 3 orders were obtained: *Accipitriformes* - 2199, *Falconiformes* - 162 and *Strigiformes* - 13. The most observations refer to the species *Clanga clanga* (891), and the fewest – to the species *Aquila heliaca* (one observation). Regarding the belonging to the IUCN Red List categories, 1341 observations are for species in the LC category, 1017 – for species in the VU category and 16 observations are for species in the NT category. At the top of the locations where the observations were made are the village of Besalma near the Congaz Lake and the Beleu Lake which is part of the Ramsar zone "Prutul de Jos". Thus, according to the data recorded in the GBIF database, in the period 2015-2024 in Moldova there were observed 15 out of 23 predatory bird species included in the Moldavian Red Book.

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GBIF Occurrence Download https://doi.org/10.15468/dl.7tffue Accessed from R via rgbif (https://github.com/ropensci/rgbif) on 2024-08-07.

On the uncertain status of the Common Nightingale (*Luscinia megarhynchos*) in the Republic of Moldova: new breeding records

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Key words: breeding proof, monitoring survey, distribution overlap, "Lower Prut" scientific reserve.

The Common Nightingale *Luscinia megarhynchos* is a small passerine from the Muscicapidae family, a close relative of the Thrush Nightingale *Luscinia luscinia* with which it can easily be confused, both species being found in Europe. These two species are vicariant, sharing only the edges of their distribution area, where they live in sympatry. On the territory of the Republic of Moldova, the Thrush Nightingale is a widespread species, with no official proof of breeding of the Common Nightingale in the area until recently. Previous studies conducted in the Republic of Moldova never mention the breeding of the Common Nightingale, excepting one monograph that has no proof to support the breeding status.

The study area is located within the "Lower Prut" scientific reserve and the field data were collected during specially conducted surveys, with subsequent monitoring of identified individuals carried out during nighttime, when the species was the most active and easy to detect by territorial singing.

On 18.04.2024 we identified a single male of Common Nightingale, singing at night, which stayed loyal to the same bush for at least 8 days in a row. After dawn the individual couldn't be monitored since tens of Thrush Nightingale males were all of the sudden starting to sing also, covering the lone Common Nightingale. The general habitat consisted of flooded willow forest on the edge of a natural canal. On 29.07.2024 we managed to record on film a 1cy bird, less than one kilometer away from the other observations.

This late proof of breeding could be influenced by the probable peripheral distribution, low densities compared to the Thrush Nightingale, lack of dedicated field trips and the ease of confusing the species. At least one location from the Republic of Moldova is now confirmed to host breeding pairs of Common Nightingales, with further research needed to conclude the whole distribution.

The beaver (*Castor fiber* L.) in the Reserve "Yagorlyk"

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Key words: beaver, *Castor fiber*, reserve "Yagorlyk", Dniester, Republic of Moldova.

According to scientific research, the European beaver (*Castor fiber* Linnaeus, 1758) disappeared from the territory of the Republic of Moldova in the middle of the second millennium AD.

Until the 1930s, the beaver in neighboring Ukraine was found in three northern regions, with a total population of less than 100 individuals. Since the 1950s, as a result of reacclimatization efforts, beaver populations began to recover and their range began to expand westwards and southwards from the northern regions of Ukraine, including downstream of the Dniester River.

Large beaver populations are known in the Carpathians in the upper reaches of the

Dniester, as well as in the Danube Biosphere Reserve (Romania, Ukraine) and in the Lower Prut Reserve (Republic of Moldova).

The scientific State Reserve "Yagorlyk" is located on the left slope of the Dniester River valley (Dubossary reservoir) 12 km north of Dubossary (47º22′N, 29º12′E).

Occurrence of the European beaver in the territory of the Yagorlyk Nature Reserve was recorded in autumn 2021. In early November its presence was noted in the tract "Balta" and in the tract "Litvina". In 2022 the presence of beaver and its active activity was recorded by fallen trees and characteristic gnawing of bark and trunks of trees (willow) in the tracts "Balta" and "Litvina". No beaver tracks were recorded on the rest of the Reserve's territory.

In 2023 no fresh traces of beaver were recorded, which is probably connected with its temporary departure from the territory or death of individuals.

In spring 2024, during the period of minimum water level in the Dubasari reservoir, beaver dwellings and fresh traces of beaver activity were found on the territory of the Reserve, which indicates its successful settlement and acclimatization on the territory of the Reserve.

In the medium term, given the rate at which this species is spreading downstream of the Dniester, it should be expected to appear in the Dniester delta in the vast wetlands of the Lower Dniester National Park.

New reports of bat fauna (Ord. Chiroptera) from Sulfur Cave and Old Pixaria Cave in the Vromoner Canyon on the Greek-Albanian Border

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Key words: sulfidic subterranean ecosystems, bat species and colonies, conservation, protected areas, Vromoner Canyon, Sarandaporo Valley.

Sulfidic hypogene caves are exceptional geological formations with great geochemical and biological value. Here we report the results of bat fauna surveys conducted in the spring and summer of the year 2024 (26th June – 02 July and 30th March – 06 April 2024) in the unique sulfidic hypogene cave systems located in Vromoner Canyon (Sarandaporo Valley), on the Greek-Albanian border.

Visual observations, thermal imaging, mist netting and recording of ultrasounds and analyses with specialized software allowed the identification of at least six bats species belonging to three families (Rhinolophidae, Miniopteridae and Vespertilionidae).

In the main gallery of Sulfur Cave we recorded eight visible clusters (between 50 – 200 individuals each) as well as young specimens which presumably lost their roost-hold and fell to the ground. Based on visual observations and ultrasounds, we estimated a number of 1000 individuals from six species: *Rhinolophus ferrumequinum* (Schreber, 1774), *Rhinolophus hipposideros* (André, 1797), *Rhinolophus blasii* Peters, 1866, *Rhinolophus euryale* Blasius, 1853, *Miniopterus schreibersii* (Kuhl, 1817), *Myotis* sp.

In Old Pixaria Cave we collected data using ultrasound recordings, direct observations, and capturing using mist net. We estimate a number of 500 individuals belonging to four species: *Rhinolophus ferrumequinum* (Schreber, 1774), *Rhinolophus hipposideros* (André, 1797), *Rhinolophus blasii* Peters, 1866, *Myotis emarginatus* (Geoffroy, 1806).

We consider that this study will strongly help the bat research and conservation both in Greece and Albania for the coming years. To date, there are 32 species of bats recorded in Albania, while in Greece there are 35. Sulfur Cave and Old Pixaria Cave host two of the biggest bat colonies in these two countries with several strictly protected bat species, listed in the Annex II of the Habitats Directive, 92/43/EU. Therefore, their inclusion in the Natura 2000 Network is well justified and of paramount importance for their conservation.

Recent Researches on the Bat Fauna of the natural regional Park "Parco regionale dei Colli euganei" (province of Padova, region Veneto, N.E. Italy)

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Key words: bats, bat distribution, Euganean Hills, *Rhinolophus ferrumequinum, Tadarida teniotis*, Veneto.

Placed in the Po River plain, separated from other mountain groups, the regional Park of Euganean Hills was the first natural Park established by the Region Veneto (N.E. Italy) in the year 1989. The protected site covers an area of approximately 18.695 hectares, all within the province of Padova, with hills of volcanic origin, with an upper thin layer of limestone rocks with some caves. Maximum elevation is 601 m a.s.l. (mount "Monte Venda"). Most of the area is greatly anthropized, with Roman ruins, several Venetian villas and cultivated areas mixed with natural areas. In July 2024 the Euganean Hills Park was designated as a Biosphere Reserve, according to UNESCO's Man and the Biosphere Programme.

In the year 2021 a monitoring of presence and distribution of Bats (Mammalia, Chiroptera) was conducted in the Park area. Previous works recorded 7 species of bats. Most data come from monitoring with active and passive bat detectors. Active bat detectors were used to perform transects in selected areas, and also by car for long distance monitoring. Passive bat detectors were placed in six different areas, selected as foraging areas or near habitats with several potential roosts.

In the year 2021, these species of Bats were recorded in the "Parco regionale dei Colli euganei" Park: *Rhinolophus ferrumequinum* (Schreber, 1774), *Pipistrellus kuhlii* (Kuhl, 1817), *Pipistrellus nathusii* (Keyserling & Blasius, 1839), *Pipistrellus pipistrellus* (Schreber, 1774), *Myotis myotis*, (Borkhausen, 1797), *Myotis daubentonii* (Kuhl, 1817), *Eptesicus serotinus* (Schreber, 1774), *Nyctalus noctula* (Schreber, 1774), *Nyctalus leisleri* (Kuhl, 1817), *Hypsugo savii* (Bonaparte, 1837), *Plecotus austriacus* (Fischer, 1829), *Miniopterus schreibersii* (Kuhl, 1817), *Tadarida teniotis* (Rafinesque, 1814).

During the research new roosts were found of these bat species: *Myotis daubentonii*, *Pipistrellus kuhlii, Myotis myotis, Plecotus austriacus. Rhinolophus ferrumequinum* was found in six grid squares of the park (previous works recorded only two sites), in buildings and in caves (natural and artificial), but everywhere with little populations. *Tadarida teniotis* was recorded in six grid squares of the park (previous works recorded only two sites), demonstrating that this park represents a good foraging area for this species, for a long time underestimated in northern Italy.

Genus *Drobacia* (Gastropoda, Helicidae) in Romania - preliminary molecular results

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Key words: terrestrial snail, Natura 2000 species, protected snail species, relict species.

The genus *Drobacia* included, until recently, two species: *Drobacia banatica* (Rossmässler, 1838), a Carpathian relict found in Romania, Hungary, Ukraine, and Serbia, and *Drobacia maeotica* (Wenz, 1926), which was initially described as a late Miocene fossil from southern Romania and later confirmed alive in the Apuseni Mountains by D. Lupu. A 2016 molecular phylogenetic analysis identified these two species as genetically distinct, but subsequent morphometric studies revealed intermediate forms, leading to the current classification of *Drobacia* as monospecific, recognizing *D. banatica* as the only extant species, with *D. maeotica sensu* Lupu, 1966 treated as a synonym.

For this study, a total of 42 specimens from the genus *Drobacia* were examined. Both adults and juveniles were hand-collected from various locations in Romania: 8 specimens from Valea Stanciului in Răchiţele (Cluj), 13 from Valea Someşului Cald, west of Ic Ponor (Bihor), and 21 from other regions within the species' Romanian distribution (from Arad, Hunedoara, Braşov, Argeş, and Prahova). A 585 bp fragment of the mitochondrial COI gene was utilized for molecular analyses.

The sequences were organized in two groups (banatica and maeotica) based on their over 99.5% identity to other *Drobacia* COI sequences available in the GenBank online database (https://www.ncbi.nlm.nih.gov/genbank/). Network analysis revealed a dumbbell-shaped phylogeny with two haplogroups separated by over 50 mutational steps. Among the 42 analyzed samples, 33 samples identified as *D. banatica* grouped together forming one star-shaped cluster, while 9 samples molecularly identified as *D. maeotica* formed the other star-shaped cluster of the phylogeny. Mean genetic distance between the two haplogroups defined as banatica and maeotica was calculated at 8.71% (±0.114 SE).

These results may suggest that both species are valid or that we are dealing with two subspecies within the *Drobacia banatica* taxon. To clarify this, further genetic studies with a larger sample size will be necessary.

A case of variation in the dorsal setae d_1 of *Ledermuelleriopsis ayyildizi* Doğan (Prostigmata, Stigmaeidae)

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Key words: Anomaly, asymmetry, dorsal seta, mite, morphology.

Ledermuelleriopsis Willmann is a relatively small genus of the family Stigmaeidae Oudemans (Acariformes: Prostigmata), with 32 species currently recognised (Fan et al., 2016, 2019; Beron, 2020; Khaustov, 2021; Doğan and Doğan, 2024). *Ledermuelleriopsis ayyildizi* Doğan, known from Türkiye, can be recognized by the presence of dimples on dorsal shields, patterns on humeral and suranal shields similar to those of dorsal shields, dorsal body setae bushy and homeomorphic, humeral setae c_2 similar to the dorsal body setae, and pseudanal setae ps_1 thicker than other pseudanal setae (Doğan, 2004).

This species typically exhibits a metapodosomal shield bearing three pairs of setae (c_1, d_1, and d_2). However, in a female, the d_1 on the right side is in a much weaker structure than that of the other side. Various researchers, including Dilkaraoğlu et al. (2016), Bingül et al. (2017), Doğan et al. (2019) and Seeman et al. (2023), have documented some variations in the species of *Eustigmaeus* Berlese, *Stigmaeus* Koch and *Storchia* Oudemans in the family Stigmaeidae. However, no variation has been documented for *L. ayyildizi* to date. This study presents the first evidence of variation in setae d_1 of *L. ayyildizi*.

The mite specimen in this study was obtained during a project (№ 121Z986), financially supported by the Scientific and Technological Research Council of Türkiye (TÜBİTAK). We gratefully appreciate TÜBİTAK's financial assistance.

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Astigmata mites and their species diversity in forests of Hamedan province

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Key words: fauna, species diversity, mite, Astigmata, Iran**.**

In this study, fauna and species diversity of astigmatid mites from forests in four regions in the Hamedan province (Western Iran), including Asad Abad, Toyserkan, Nahavand and Hamedan, were studied at three different times (May, August and October). The astigmatid mites were collected and extracted from soil and litter under forest trees by using a Berlese funnel, then directly mounted in Hoyer's medium for permanent microscope slides. In this survey, 11 species belonging to four genera from two families were collected and identified. Among them, a species was recorded as a new species for astigmatid mites and also one species new for Iranian mite fauna that were marked by * and **, respectively.

The scientific names of species are presented below:

-- **Acaridae Latreille, 1802**
\+ ***Tyrophagus* Oudemans, 1924**
\- *Tyrophagus perniciosus* Zakhvatkin, 1941
\- *Tyrophagus* **sp. nov.***
\- *Tyroglyphus longior* Gervais, 1844
\- *Tyrophagus similis* Volgin, 1949
\- *Tyrophagus vanheurni* Oudemans, 1924
\- *Tyrophagus neiswanderi* Johnston & Bruce, 1965
\- *Tyrophagus putrescentiae* (Schrank, 1781)
\+ ***Rhizoglyphus* Claparède, 1869**
\- *Rhizoglyphus robini* Claparède, 1869
\- *Rhizoglyphus echinopus* (Fumouze & Robin, 1868)
\+ ***Cosmoglyphus* Oudemans, 1932**
\- *Cosmoglyphus* sp.
-- **Glycyphagidae Berlese, 1897**
\+ ***Austroglycyphagus* Fain & Lowry, 1974**
\- *Austroglycyphagus* (*Austroglycyphagus*) *hughesae* Fain, 1975**

The species diversity indexes were calculated for sampling regions by using the Ecological methodology 6.0 software and data analysis was performed by using SPSS 20 software. Based on one-way ANOVA, the highest species diversity and richness were shown in the Toyserkan region. The Nahavand region was the second grade after the Toyserkan region. The Smith-Wilson's evenness index in Nahavand region was categorized between Toyserkan and Hamedan regions. Also, the Nahavand and Toyserkan regions had the highest species similarity index while the Asad Abad and Hamedan regions had the highest species similarity. The members of *Tyrophagus perniciosus* had the highest species stability in all regions, especially in the Toyserkan region (65.49 > 50).

Taxonomic diversity of zooplankton communities in the Dubasari Reservoir (Republic of Moldova)

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Key words: zooplankton, the rezervoir Dubasari, fauna, diversity.

The taxonomic structure of zooplankton communities is determined by the number and diversity of component species, this serves as a criterion for assessing the stability of the aquatic ecosystem, as the changes in the structure of biotic communities affect directly the functioning of aquatic ecosystems.

The Dubasari Reservoir was built in 1954 in the lower part of the middle sector of the Dniester River, on the territory of the Republic of Moldova, being divided into three main parts: upper, middle and lower sector. The study of the faunal spectrum of the zooplankton of the Dubasari Reservoir ecosystem presented in this paper is based on the data of zooplankton monitoring during the years 2008-2024 at three sampling points (Erjovo, Goieni, Cocieri).

The taxonomic diversity of zooplankton in the ecosystem of the Dubasari Reservoir during the investigation period was represented by 199 species and taxonomic varieties belonging to 79 genera, 34 families and 12 orders, which represent three main groups of zooplankton: Rotatoria and two large groups of lower crustacean - Cladocera and Copepoda. It was identified that the Rotifera fauna of the Dubasari Reservoir is composed of 117 species belonging to 33 genera and 19 families. The most numerous family was Brachionidae, with four genera (*Brachionus, Kellicottia, Keratella, Notholca*) and 28 species and varieties, out of which the main contribution was the genus *Brachionus*, with 18 species and varieties. Cladocerans were represented by 49 species from 28 genera and 10 families, with the most numerous family Chydoridae and included 26 species. Copepods were represented by 33 species belonging to 18 genera and 5 families the main contributor being the family Cyclopinae with 27 species.

The research results showed a maximum diversity of zooplankton in the middle sector of the Dubasari Reservoir, which constituted 143 species or 72% of the species diversity.

This study was supported by the research national projects (Eutrophication processes of the Dubasari Reservoir under climate change conditions. 23.70105.7007.09T), ("Determination of changes in the aquatic environment, assessment of migration and the impact of pollutants, establishment of the legitimacy of the functioning of hydrobiocenoses and prevention of harmful consequences on ecosystems" 20.80009.7007.06), and (Evaluation of the structure and functioning of the animal world and aquatic ecosystems under the influence of biotic and abiotic factors in the context of ensuring ecological security and the well-being of the population 010701) funded by (Ministry of Education and Research).

A new species of *Synapseudes* (Crustacea, Tanaidacea, Metapseudidae) from the Seas of Crete

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Key words: Mediterranean Sea, new species, SEM, molecular markers, Cytochrome *C* Oxidase I (COI).

A new species of the genus *Synapseudes* is reported and described here, from the shallow waters of northern Crete. This species represents the first report of the genus from the Seas of Crete and the fourth species described from the Mediterranean Sea.

The already described three species of *Synapseudes* are: *S. shiinoi* Riggio, 1973 found on the rocky shores of Mount Pellegrino, Bay of Palermo, North West of Sicily, *S. mediterraneus* Băcescu, 1977 from the waters of Israel, and *S. cystoseirae* Amar & Cazaubon, 1978 from Le Brusque region, and Frioul Archipelago, the Gulf of Marseille, France.

Synapseudes n. sp. described here differs from the other three known species by the following relevant characters: pereopod 1 propodus with three, rarely four ventral spines; pereopods 2, 3 propodus with three, very rarely four ventral spines; number of dorsal apophyses of pereopods 1-3 basis; antennule peduncle with articles 2 and 4 wider than long; antennule inner margin of first peduncular article with about nine denticles; antenna peduncular article 2 with two sharp denticles on inner margin.

A partial fragment for the cytochrome *c* oxidase subunit I (COI) gene (610 bp) was obtained from a specimen of *Synapseudes* n. sp.; this will represent the first public sequence record of a *Synapseudes* species in the GenBank and Bold Systems databases.

With the description of *Synaspseudes* n. sp, the total number of species in the genus will increase to 28.

Invasive or just non-native? The fate of two introduced land snail species in central Romania

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Key words: allogenous species, brown lipped snail, white lipped snail, invasiveness, dispersion, variability.

Two species belonging to the genus *Cepaea*, *C. hortensis* and *C. nemoralis* have been previously recorded for the first time in Romania, in the city of Sibiu, being introduced almost a century apart. Since the first record, the colonies of *C. hortensis* were studied in 2004, 2017 and 2024 while *C. nemoralis* was annually monitored, the results being presented here.

The current distribution of *C. hortensis* suggests that following the deliberate introduction, during the last century the snail has successfully colonised the city of Sibiu, becoming the most abundant species in the urban area, but only accidentally present around the city. The isolated colonies express a wide variability, and the changes in their location, size and genetic structure in the short term, suggest the effect of drift and high human pressure.

C. nemoralis was most probably introduced accidentally and has colonised a small playground in a highly urbanised area of Sibiu, where it seems to be still confined. The size of the colony has increased, with some annual fluctuations. The founder effect is evident in the low variability of the colony of this snail, known as expressing a high polymorphism. While for *C. hortenis*, the current distribution excludes an invasive behaviour, the expansion of *C. nemoralis* is most probably hindered by the isolation of the first colony. At this point, the colony appears to be the only one in Sibiu, though passive dispersal could allow the species to colonise more favourable habitats, making it impossible to predict the evolution and invasiveness of *C. nemoralis* in Central Romania.

Spatial distribution, frequency, density and yield of octopus *Octopus vulgaris* from the Algerian central coast

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Key words: *Octopus vulgaris*, distribution, frequency, density, yield, Algerian central coast.

Data on the distribution, frequency, density and yield of the octopus *Octopus vulgaris* were obtained from experimental trawling surveys. The specimens were caught during the period May-July of the three years 2013, 2014 and 2015 using the GOC73 bottom trawl in the trawlable areas 20-200 m deep of the coastline of the central Algerian region (Tipaza, Algiers and Boumerdes), covering three strata (A, B and C).

This species is caught in the central region, but differences were recorded in all three sectors studied. This species extends mainly from the coast to the end of the continental shelf 100 m depth, however catches at depths exceeding 200 m are scarce and exceptional. The Tipaza and Boumerdes sectors recorded the highest catches in weight with a frequency of 33%. The maximum frequency of the common octopus *Octopus vulgaris* is recorded at the level of the first two strata is 74%. The densities obtained are relatively close with a slight superiority of the year 2014. The surveys highlighted a decrease in densities with depth. The density of stratum A is the highest over the three years reaching 1209.90 individuals/km^2. The highest yields are noted at the level of the Tipaza and Boumerdes region. The yield with depth shows a tendency to regression. As for the years, this index obtained in 2014 seems to be higher than that of 2013 and 2015.

Digeneans (Platyhelminthes, Trematoda, Digenea) of Georgia

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Key words: biodiversity, Caucasus, Digenea, helminths, host, parasite.

Digeneans (Platyhelminthes, Trematoda, Digenea) have complex life-cycles with several hosts involved. They are parasites of all vertebrate groups and of a vast variety of invertebrates. In the present study we aim to provide an inventory of digenetic trematodes from Georgia including records from the freshwater, marine and terrestrial realms. Our data are based on a critical review of literature and our new records. The trematode fauna of Georgia is represented by 186 species belonging to 108 genera, 47 families and 17 superfamilies. A total of 37 species belong to the order Diplostomida and 149 species to Plagiorchiida. The most recorded trematode species belong to Echinostomatidae (19 species), followed by Lecithodendriidae (13 species), Diplostomidae (12 species), Dicrocoeliidae (9 species), Brachylaimidae (8 species) and Strigeidae (8 species). Whereas Panopistidae, Azygiidae, Philophthalmidae, Typhlocoelidae, Encyclometridae, Haploporidae, Eumegacetidae, Faustulidae, Phaneropsolidae, Prosthogonimidae, Stomylotrematidae, Deropristidae, Cryptogonimidae, Brachycoeliidae, Orientocreadiidae are represented with only one species. The majority of digenean species were recorded as adults (160 species), only a small fraction being found as cercariae (33 species) or metacercariae (24 species), in their first or second intermediate hosts, respectively. Predominantly, records of trematodes (62 species) from birds were found, followed by those parasitising fish (50 species, i.e. 32 species as adults and 18 as metacercariae), mammals (33 species) and amphibians (25 species, i.e. 23 species as adults and 2 as metacercariae), with the least number of species reported from reptiles (12 species, i.e. 9 species as adults and 3 as metacercariae). The majority of digeneans were freshwater species (154 species), while a much lower number of marine (12 species) and terrestrial (21 species) digeneans was found. Adult digeneans recorded together with another life-cycle stage (metacercariae and/or cercariae) comprised 28 species, i.e. for 15% of the total trematode species number, a part of their life-cycle is known. Thus, large-scale investigations are needed to obtain data on trematode biodiversity, life-cycles and transmission pathways to be further used for ecological and epidemiological studies, as well as for biodiversity conservation in Georgia.

Earthworm species diversity of mountainous territories of Georgia

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Key words: species diversity, earthworms, conservation, mountainous territories, Georgia**.**

Georgia is a mountainous country with half of its territory located above 1000 m a.s.l. Climate change caused by natural and anthropogenic factors pose a serious challenge to the biodiversity of this ecosystem and its study is significant for the conservation and sustainable use of its components.

Earthworms (Oligochaeta: Lumbricidae) are the most important soil components and interesting organisms from a species diversity point of view. Summarizing the literature and our own data shows that the mountainous territories' lumbricofauna of Georgia is represented by forty-one species and subspecies belonging to eleven genera. Thirty-seven species and subspecies are inhabitants of low- and mid-mountain regions. The genus *Dendrobaena* Eisen, 1874 is characterized by species diversity, with eighteen described species and subspecies. The genera *Eisenia* Malm, 1877 and *Omodeoia* Kvavadze, 1993 are both represented by four species/subspecies. Three species/subspecies represent the genus *Dendrodriloides* Kvavadze, 2000 and two species represent the genus *Allolobophora* Eisen, 1874. Only one species is described for each of the six genera: *Aporrectodea* Örley, 1885, *Bimastos* Moore, 1893, *Dendrodrilus* Omodeo, 1956, *Eiseniella* Michaelson, 1990, *Helodrilus* Hoffmeister, 1845 and *Octolasion* Örley, 1885. Sixteen species and subspecies belonging to six genera are distributed in the high mountain territories of Georgia. *Dendrobaena* and *Dendrodriloides* are relatively species-rich genera (with five and four species/subspecies, respectively) while the genera *Allolobophora*, *Eisenia* and *Omodeoia* comprise of two species/subspecies each, and only one subspecies represents the genus *Eiseniella*.

These results contribute to the lumbricofauna monitoring of Georgia's mountainous regions and to the continuous evaluation and conservation efforts of their biodiversity.

Helminthological research of the invasive impact on cucumber culture in greenhouses under the conditions of the Republic of Moldova

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Key words: cucumber sectors, nematodes, phytosanitary control, diversity, invasive impact.

The results estimate the phytosanitary helminthological control achieved at the cucumber growth from protected areas, in elucidating the parasitic impact with the establishment of the invasive nematodes, with the determination of the degree of affection, the structure, the frequency and argumentation of protection system. The investigations were carried out in 15 localities, 25 cucumber sectors from various areas specialized in the cultivation of vegetables. As a result of the nematological researches was established the structure of the parasitic nematode complexes with: 30 species included in eight families from two orders classified according to the specialization of the trophic spectrum in five groups, with the predominance of species in the sector of the Center area (30 species), compared to the North area (22 species), classified by trophic specialization. It was found the values with variations from 10% to 50%, caused by invasive associations, with specific parasitic effects of the generes: *Meloidogyne* sp., *Pratylenchus* sp., *Ditylenchus* sp., *Paratylenchus* sp., *Helicotylenchus* sp., *Rotylenchus* sp., *Fylenchus* sp. The results of this phytosanitary monitoring estimate the application and the contribution in elucidating the degree of nematological damage for the forecasting and argumentation of the protection measures predestined to the vegetable agrocenoses.

The investigations were carried out with the support of the institutional project - State Program with the theme: "Diversity of hematophagous arthropods, zoo- and phytohelminths, vulnerability and strategies to tolerate climatic factors. the development and implementation of innovative procedures for the integral control of species of community interest", with code: 20.80009.7007.12 F and of the Subprogram with code 010701 "Evaluation of the structure and functioning of biocenoses, aquatic and terrestrial habitats under the influence of biotic and abiotic factors in the context of ensuring ecological security and the well-being of the population", from the USM.

Relationship between root-knot nematodes of the genus *Meloidogyne* and their telluric antagonists

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Key words: *Meloidogyne*, pesticides, antagonists, vegetable crops.

Root-knot nematodes of the *Meloidogyne* genus are extremely polyphagous obligate soil parasites. They are considered one of the most formidable enemies of market garden crops, both in greenhouses and in open fields.

The study was carried out on market garden crops (zucchini and bell pepper) in the commune of Fouka wilaya of Tipaza. Our work focuses on the damage caused by root-knot nematodes of the *Meloidogyne* genus, by studying the root-knot index of the market-garden crops surveyed, as well as carrying out phytosanitary and pedological studies, and attempting to inventory the antagonists of these bio-aggressors. These show that the *Meloidogyne* incognita species is dominant in the region. Various physico-chemical soil studies reveal that the Fouka region has an alkaline pH, rich organic matter and high moisture content. We found that the different crops studied (zucchini and bell pepper), at different depths (10 cm and 20 cm), showed a high diversity of predatory and parasitic nematophagous fungi. We were able to identify two genera: *Arthrobotrys* and *Aspergillus,* with a dominance of the *Arthrobotrys* genus.

Effect of habitat structure on web characteristics of orb web spider *Neoscona vigilans* (Pakistan)

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Key words: behavior flexibility, web geometry, orb web characteristics, prey capture, consequences of the forest edge.

The effectiveness of arachnids in their environment is frequently evaluated as an environmental secret. Spiders are closely examined as top ecological predators because they control prey density, which has an effect on the web's dominance. Arachnids' circular configurations are among the best mathematical structural models among living things.

To fully understand the spectrum of flexibility in spiders' web-building behavior, more research on spiders in their natural environments is required. It is believed that spiders growing in environments where environmental factors like wind significantly damage their webs will require flexible web designs. Spiders' ability to hunt depends on the availability and selection of suitable habitat.

In order to examine the influence of habitat variables on orb web features and prey capture, I investigated the web features of the orb spider *Neoscona vigilans* (Araneae) in two dissimilar environments that differed in their vegetation structure (canopy size and plant height). Despite pronounced changes in wind speed, I discovered substantial differences in web geometry (mesh height, capture region, capture fiber span, and web asymmetry) and the amount of prey caught between webs built inside the protected habitat of *Duranta erecta* and those built along an open field of *Morus rubra*. This shows that *Neoscona vigilans* have a considerable degree of wind-dependent web-building flexibility. In addition, my findings may be explained by differences in insect caught and damage caused by wind between habitats, demonstrating that different species employ different defense systems to deal with environmental restrictions.

Variation in demographic parameters of two cave-dwelling *Paranemastoma sillii sillii* (Opiliones: Nemastomatidae) populations

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Key words: *Paranemastoma sillii sillii*, mark-recapture, survival, recapture probability, abiotic factors.

Caves are considered extreme environments, primarily due to the absence of light and the limited availability of organic matter (Culver & Pipan, 2009). Facultative cave-dwelling species, which inhabit both surface and subterranean habitats, play an important role in linking these two environments. Understanding how their demographic parameters vary in time and among populations can shade light on factors influencing cave colonisation. *Paranemastoma sillii silii* Hermann 1871 (Dyspnoi: Nemastomatidae), is a troglophile species that can be found in both surface and subterranean habitats. From July 2023 to May 2024, we conducted a mark-recapture study using a robust design in two Romanian caves: Cloșani Cave and Lazului Cave. Each captured individual was uniquely marked with acrylic paint, using a combination of marks and colour applied dorsally and on the femur (Plăiașu et al., 2017). We estimated two demographic parameters: recapture probability and survival. In Cloșani Cave, 272 unique individuals were captured, with 82 individuals captured only once. In Lazului Cave, 946 unique individuals were captured, with 397 individuals captured only once. In Cloșani Cave, the recapture probability was significantly lower in December and significantly higher in August. Survival was generally high, with a significant decrease in November. In Lazului Cave, the recapture probability was significantly lower in March and significantly higher in November. Survival was generally high but lower in the autumn months. Our results suggest that recapture probability and survival vary over time and between populations. Quantifying this variation is essential for understanding population dynamics in these extreme environments.

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Niche partitioning of feather mites within a seabird host, *Calonectris borealis*

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Key words: mites, shearwaters, mite counts, spatial and trophic partitioning, stable isotopes, Canary Islands.

According to classic niche theory, species can coexist in heterogeneous environments by reducing interspecific competition via niche partitioning. However, support for the role of competition on niche partitioning remains controversial. Here, we tested for spatial and trophic partitioning in feather mites, a diverse and abundant group of arthropods. We focused on the two dominant mite species, *Microspalax brevipes* and *Zachvatkinia ovata*, inhabiting flight feathers of the Cory's shearwater, *Calonectris borealis*. We performed mite counts across and within primary and tail feathers on free-living shearwaters breeding on the oceanic island Gran Canaria (Canary Islands). We then investigated trophic relationships between the two mite species and the host using stable isotope analyses of carbon and nitrogen on mite tissues and potential host food sources. The distribution of the two mite species showed clear spatial segregation among feathers; *M. brevipes* showed high preference for the central wing primary feathers, whereas *Z. ovata* was restricted to the two outermost primaries. Morphological differences between the two mite species support an adaptive basis for the spatial segregation of the two mite species. However, the two mites overlap in some central primaries and statistical modeling showed that *Z. ovata* tends to outcompete *M. brevipes*. Isotopic analyses indicated similar isotopic values for the two mite species and a strong correlation in carbon signatures between mites inhabiting the same individual host suggesting that diet is mainly based on shared host associated resources. Among the four candidate tissues examined (blood, feather remains, skin remains and preen gland oil), we conclude that the diet is most likely dominated by preen gland oil, while the contribution of exogenous material to mite diets is less marked. Our results indicate that ongoing competition for space and resources plays a central role in structuring feather mite communities.

Entomofauna diversity and vegetation analysis from Bacău II Lake (Bacău County)

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Key words: Entomofauna diversity, vegetation analysis, Self Organizing Maps, Hierarchical Cluster Analysis.

This study aimed to investigate the entomofauna diversity and vegetation analysis at Bacău II Lake – Șerbănești (Bacău County). The study was conducted in the warm seasons of 2022 and 2023 and the beginning of the warm season of 2024. For the entomofauna analysis, the Self Organizing Maps (SOM) algorithm was used to order insects according to environmental variables and communities of aquatic insect taxa. Analytical indices, such as abundance (A), constancy (C), and dominance (D), with the synthetic index represented by the ecological significance index (W) were determined. For vegetation analysis, phytocoenological relevés were conducted at each station.

The study results showed that the entomofaunistic diversity in Bacău II Lake is significantly influenced by the surrounding vegetation and environmental conditions. Specific associations between insect taxa and vegetation types were identified, highlighting the ecological interdependencies within these habitats. The entomofauna sampled from the three stations on the shore of Bacău II Lake consists of a total of 770 individuals of aquatic insects (larvae, pupae and adults), which belong to 28 determined taxa, classified into eight orders: *Collembola* Avebury, 1870; *Ephemeroptera* Hyatt, Arms, 1890; *Odonata* Fabricius, 1793; *Heteroptera* Latreille, 1810; *Megaloptera* Latreille, 1802; *Coleoptera* Linnaeus, 1758, *Trichoptera* Kirby, 1813; and *Diptera* L., 1758. The highest numerical abundance was recorded in May when most aquatic insects have their developing aquatic stage. Also, aquatic insects are abundant in the studied lacustrine environment throughout the warm season. The constancy index showed that some taxa from the family *Coenagrionidae* Kirby are euconstant, and some taxa from the families *Chironomidae* Newman, *Corixidae* Leach and *Gerridae* Leach are constant. The index of ecological significance shows that some taxa from the families *Chironomidae*, *Coenagrionidae*, *Baetidae* Leach, and *Corixidae* Leach are characteristic species of the Bacău II lake biocoenosis. The rest of the species are accessory or accidental. The transparency and depth of the lakes varied between the sampling stations. The plant associations identified are part of the classes *Potamogetonetea* Klika in Klika et Novák 1941 and *Lemnetea* O. de Bolòs et Masclans 1955.

In conclusion, this study emphasizes the importance of maintaining and protecting the entomofauna and vegetation of Lake Bacău II. The abundance, constancy, and dominance indices provided a comprehensive understanding of the insect community structure, while the ecological significance index emphasized the

critical areas for conservation efforts. Maintaining and protecting the entomofauna and vegetation of Lake Bacău II is essential for preserving its ecological balance.

Insect biodiversity in the burned forest in Northern Algeria

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Key words: fire, insects, Collembola, Diptera, Baïnem Forest.

Forests are home to many species of insects that are astonishingly diverse from a biological point of view and which play an important role in the functioning of ecosystems. Little is generally known about the intimate relationship between certain insects and fires. The objective of this study is to evaluate, through a qualitative and quantitative inventory of the entomofauna after the passage of fire, the post-fire dynamics of entomological stands. Thus two stations are chosen in the Baïnem Forest, one burned down, the other not. Insects were sampled using pitfall traps. Sampling was planned from December 2019 to March 2020 but with the Covid-19 pandemic we were only able to sample until January 2020. Thus, a total of 20 Barber pots are sampled at the level of each of the two study stations. Sampling is repeated every 15 days.

The results obtained reveal a richness of 32 species (with 278 individuals) at the burnt station with a predominance of Collembola and Diptera. On the other hand, the non-burnt station revealed a richness of 32 species represented by 190 individuals with a predominance of Hymenoptera and Diptera. The equi-distribution values show that the non-burnt station (E = 0.56) is more structured than the burnt one (E = 0.39), which implies that the numbers of species present in the burnt station tend to be in imbalance between them due to the passage of fire. At the end of the work, the fire, when it is spontaneous and moderate, appears as an ecological factor which determines the entomological distribution and diversity. The modifications brought about by fire on vegetation and on the physicochemical composition of the soil play a determining role in the population dynamics of insect species.

The relationship between the characteristics of *Crambe tataria* populations and the insect communities in Northeastern Romania

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Key words: *Crambe tataria*, plant-insect interactions, correlation test, entomology, biodiversity, steppic habitat.

The relationships between insect species and plant morphological characters are complex but vital in their ecosystem structure and functioning. These relationships are especially important for the distribution and abundance of insects since they influence ecological processes that have to do with the growth and development of host plants. Our study focused on certain morphological characters of the species *Crambe tataria* Sebeók (Brassicaceae) and the diversity of associated entomofauna to show how biotic factors influence host population dynamics. The study, carried out in May 2024, involved the collection of data from four localities in Iași and Vaslui counties, analysing 125 individuals of *C. tataria*. We investigated insect presence, plant growth stages (vegetative or flowering), and environmental variables such as elevation, slope, and aspect. Measured *C. tataria* variables were plant height, number of leaves/plants, and inflorescence circumference, and insect variables included the total number of insects and number of individuals for the species *Bibio hortulanus* L., *Camponotus piceus* (Leach, 1825), *Carpocoris purpureipennis* (DeGeer, 1773), *Cercopis sanguinolenta* (Scopoli, 1763), *Dolycoris baccarum* L., *Eurydema ornata* L., and *Tropinota* (*Epicometis*) *hirta* (Poda, 1761).

To understand the relationships between these variables, we applied the Kendall's rank correlation test, using R. The study results showed that 38 insect species were identified on the *C. tataria* individuals (seven of them determined only at the level of gender). The trophic groups were represented by 26 phytophagous insects, six omnivorous insects and five predatory insects. The most frequent families were Cetoniidae (575 individuals) and Cercopidae (237 individuals), and the most frequent orders identified were Coleoptera (607 individuals) and Hemiptera (343 individuals). Also, the study revealed statistically significant relationships between some morphological characters of the *C. tataria* species and the diversity of associated insects.

Along with the decrease in the number of leaves/plants, there was an increase in the number of insects/plants. At the same time, the increase in the plant height and the inflorescence circumference causes an increase in the number of insects/plants. In addition, a positive correlation was observed between plant height and the number of individuals of *Cercopis sanguinolenta*, suggesting that this species prefers taller plants, more suitable for feeding and hiding from predators. As the inflorescence circumference increases, the number of individuals of *Cercopis sanguinolenta*, *Eurydema ornata* and *Bibio hortulanus* increases. This suggests that these species prefer plants with larger inflorescences, which are a better source of food for them.

Morphological characters of *C. tataria* largely determine the diversity and abundance of associated insects, underlining the paramount importance these traits have for plant-insect community interactions. This type of study will be also very important to understand the complex insect-plant interactions, which in turn can form a background for the application of different strategies aimed at the conservation of rare plant species.

Three new species of dragonflies (Insecta: Odonata) from the Plaiul Fagului Reserve, Republic of Moldova

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Key words: Odonata, new record, forest reserve, rare species.

The Plaiul Fagului Reserve (47°29'43"N 28°2'69"E) is located in the north-western part of the Central Codri Plateau, 70 km from the Chișinău city. The territory of this reserve is crossed by several small streams, one of which is the Rădeni River. On the territory of the reserve there are four large ponds, as well as several small ones, that dry up periodically.

In the Plaiul Fagului Reserve a total of 26 species of Odonata were identified, which belong to 16 genera and 6 families (Munjiu & Bușmachiu, 2023; Grozdeva et al., 2023).

The investigations carried out during April-August 2024 in the Plaiul Fagului Reserve resulted in identification of three new species of dragonflies: *Aeshna cyanea* (Müller, 1764), *Cordulia aenea* (Linnaeus, 1758) and *Isoaeshna isoceles* (Müller, 1767). *Aeshna cyanea* is the 47th dragonfly species confirmed in the Republic of Moldova.

Currently, the number of Odonata species from the reserve is 29, being more than half of the number reported from the Republic of Moldova (Bușmachiu & Munjiu, 2024).

The Plaiul Fagului Reserve is one of the most valuable protected areas with unique and rare species of dragonflies *Leucorrhinia pectoralis* and *Anax imperator* included in the Red Book of the Republic of Moldova (2015) and can be considered as a model of efficient management of natural ecosystems from our country.

The work was carried out with financial support by project „Assessment of the state of plant, fungi and animal species, development of the list of species with rarity status and the algorithm for their presentation in the 4th edition of the Red Book of the Republic of Moldova".

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Studies concerning the invasive Auchenorrhyncha fauna detected in Southern Romania in the 2022-2023 period in apple and plum orchards

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Key words: invasive insects, leafhoppers, planthoppers, treehoppers, apple, plum.

Invasive species have become an extremely important area of study in recent years, especially in Europe and the Americas. In the context of human activity and global warming, different species of insects penetrated new regions, with a negative impact on local biodiversity. The Auchenorrhyncha suborder represents a group of economically important sap-feeding insects, many of them being invasive in Europe.

This paper presents data on the presence and abundance of invasive Auchenorrhyncha in orchards of apple and plum in the experimental field Moara Domnească Didactic Station near Bucharest in the years 2022 and 2023, from April to November. The insects were collected on yellow sticky traps (21 x 29.7 cm - the size of an A4 page), nine traps/orchard and replaced every two weeks. A total of 234 traps were used for each year. In total, eight invasive species of Auchenorrhyncha have been identified in apple and plum orchards in this study: *Metcalfa pruinosa* (Say, 1830), *Stictocephala bisonia* Kopp & Yonke, 1977, *Zyginella pulchra* Löw, 1885, *Erasmoneura vulnerata* (Fitch, 1851), *Orientus ishidae* (Matsumura, 1902), *Phlogotettix cyclops* (Mulsant & Rey, 1855), *Scaphoideus titanus* Ball, 1932 and *Japananus hyalinus* (Osborn, 1900). Of the listed species, five are economically important potential or confirmed phytoplasma vectors, namely *M. pruinosa*, *S. bisonia*, *O. ishidae*, *P. cyclops* and *S. titanus*. For both years, the total number of collected specimens was 341, of which 69.8% in 2022 and 30.2% in 2023 and 85.9% in the apple orchard and 14.1% in the plum orchard. Related to the annual abundance, a total of 238 specimens were recorded in the year 2022, of which 85.7% in apple and 14.3% in plum, while in the year 2023 a total of 103 specimens were recorded, 86.4% in apple and 13.6% in plum.

DNA barcoding of Coleoptera (Insecta) from the Republic of Moldova

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Key words: coleoptera, dead wood, molecular biology.

The results of DNA barcoding of 12 coleopteran species belonging to 12 genera and 8 families are presented. Beetles were collected directly from plants and with the help of flight interception traps mounted on the trunks of dead oak (*Quercus robur*), ash (*Fraxinus excelsior*), poplar (*Populus tremula*), willow (*Salix* sp.) and elm (*Ulmus* sp.) in the Plaiul Fagului Reserve. Three traps each were mounted at a height of 2, 4, 6 meters above the ground on 8 trees. Extraction of insects from traps was performed once every 14 days, starting from May till September. Microscopic-sized specimens of coleopterans were extracted from the wood substrate by the modified flotation method.

Among the identified species, 10 are saproxylic (Staphylinidae: *Stenus ochropus* Kiesenwetter, 1858, *Euconnus fimetarius* (Chaudoir, 1845), *Sepedophilus testaceus* (Fabricius, 1792); Scraptiidae: *Anaspis frontalis* (Linnaeus, 1758); Carabidae: *Dyschirius globosus* (Herbst, 1784); Leiodidae: *Agathidium nigripenne* (Fabricius, 1792); Curculionidae: *Scolytus multistriatus* (Marsham, 1802), *Xyleborus dryographus* (Ratzeburg, 1837), *Xyleborinus saxesenii* Ratzeburg, 1837, Zopheridae: *Rhopalocerus rondanii* (Villa & Villa, 1833)), directly associated with dead wood, and 2 species are phytophagous or feeding on nectar and pollen (Elateridae: *Cidnopus pilosus* (Leske, 1785); Nitidulidae: *Brassicogethes aeneus* (Fabricius, 1775)) and were found by chance in the flight interception traps. This study provides a valuable basis for future molecular biology research on saproxylic beetles from the Republic of Moldova.

The work was carried out with financial support from subprogram 010701 „Evaluation of the structure and functioning of the animal world and aquatic ecosystems under the influence of biotic and abiotic factors in the context of ensuring ecological security and the well-being of the population" and project „Assessment of the state of plant, fungi and animal species, development of the list of species with rarity status and the algorithm for their presentation in the 4th edition of the Red Book of the Republic of Moldova".

Cucujus cinnaberinus (Scopoli, 1763) and *Mesosa curculionoides* (Linnaeus, 1761) larvae and their associated fungi in Plaiul Fagului Reserve, Republic of Moldova

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Key words: coleoptera, fungi, molecular biology, dead wood.

Stressful climatic conditions are highly affecting deciduous trees, increasing the risk of premature dying. Most wood-inhabiting fungi are generally assumed to be primarily dispersed by wind, with the exception of a few species that are involved in mutualistic relationships with insects, particularly wood-inhabiting beetles (Coleoptera). The aim of this study is to reveal the insects and their associated fungi found on dead wood. Beetle larvae were collected in February 2024 from the decomposing oak trunks (*Quercus robur*) found in the Plaiul Fagului Reserve, Republic of Moldova. For their complete identification, the coleopteran larvae were divided in two parts: anterior part - head capsule with mouthpart was used for fungal isolation and molecular identification and posterior part - abdomen with telson used for coleopteran species identification.

As a result of the DNA barcoding, two Coleoptera species were identified: *Cucujus cinnaberinus* and *Messosa curculionoides*. The fungi *Trichoderma harzianum* and *Clonostachys rosea* were isolated from anterior parts of two larvae of *C. cinnaberinus*. *T. harzianum* was also isolated from *M. curculionoides*, along with another filamentous fungus identified as *Penicillium sumatraense*. Regarding *T. harzianum*, its potential use as a biological control agent against phytopathogenic molds is well known. Similar applications are mentioned also for *C. rosea*. However, the presence of *P. sumatraense* is being reported for the first time on saproxylic insects and decomposing wood.

Further research into saproxylic insects and their communities of wood-inhabiting fungi will contribute to better understanding of the ecosystem services provided in the saproxylic-oriented forest management.

The work was carried out with financial support from subprogram 010701 „Evaluation of the structure and functioning of the animal world and aquatic ecosystems under the influence of biotic and abiotic factors in the context of ensuring ecological security and the well-being of the population" and project „Assessment of the state of plant, fungi and animal species, development

of the list of species with rarity status and the algorithm for their presentation in the 4th edition of the Red Book of the Republic of Moldova".

Temporal and spatial analysis of carabid diversity (Coleoptera: Carabidae) in a maize (*Zea mays* L.) agroecosystem

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Key words: Carabidae, bioindicators, biodiversity, sustainable agriculture, integrated pest management (IPM).

The Carabidae (Coleoptera) serve as a valuable tool for monitoring the impacts of various control measures, highlighting their role as potential ecological indicators. This study investigates the diversity and spatial-temporal distribution of carabids in a maize (*Zea mays* L.) agroecosystem within the context of integrated pest management (IPM). The study was conducted over two agricultural years (2022–2023), collecting seasonal data from the experimental field at Moara Domnească Didactic Farm (Ilfov County) to evaluate fluctuations in the abundance and diversity of carabid species. Pitfall traps were used to monitor carabid populations at different stages of the maize growth cycle.

The results indicate significant variability in carabid distribution depending on the season and the developmental stage of the maize crop. Certain species, mostly from the *Harpalus* genus, showed peak activity during specific growth stages of the crop, highlighting the dynamic nature of carabid populations in response to agricultural practices. The data suggest that carabid diversity is closely linked to crop phenology and environmental factors, emphasizing the role of these beetles as key bioindicators within the agroecosystem. The study highlights the importance of carabids as bioindicators in agroecosystems and provides valuable insights for the implementation of IPM strategies, thereby contributing to sustainable and efficient maize crop management.

New insights into dung beetle fauna in Valmiki Tiger Reserve, India

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Key words: dung beetles, Valmiki tiger reserve, climate change, biodiversity conservation.

The dung beetle fauna of the Valmiki Tiger Reserve (VTR) and National Park in Bihar, India, was surveyed to document the diversity of this group. The landscape of VTR serves as an ecotone region where two different types of ecosystems meet: the lower Shivalik hills and the flood plains of the Gandak river. As a result, the species present here generally represent both overlapping landscapes. Seventy-two species within eighteen genera, belonging to seven tribes, were collected using dung from various animals (cow, one-horned rhinoceros, elephant, gaur, spotted deer, sambar, nilgai and human) as bait. A total of forty eight species were recorded for the first time in the state of Bihar. Since the present study was conducted in a highly protected tiger reserve, it provides an essential record of the dung beetle fauna and offers the first benchmark data to monitor populations. This data is crucial for conservation efforts and the preparation of a management plan, especially in the face of continued threats from humans, including the climate crisis. The documented diversity not only enriches our understanding of the region's biodiversity but also highlights the ecological importance of dung beetles in nutrient cycling and soil health. Monitoring these populations over time will be vital for assessing the impacts of environmental changes and ensuring the resilience and stability of these ecosystems.

Insights on saproxylic beetles conservation in Romanian Carpathians: LIFE ROsalia project

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Key words: Saproxylic beetles, LIFE Nature, Habitats Directive, EU Biodiversity strategy for 2030, Natura 2000, LIFE ROsalia.

Saproxylic insects rely significantly on habitat conditions, including factors like deadwood availability, old-growth trees, tree diversity, and light. The Putna-Vrancea Natura 2000 site, stands out as one of the most densely forested areas in the Carpathians and covers only a small part of the saproxylic beetle distributions (Mirea et al., 2024).

Nevertheless, historical forestry management practices, including selective logging and the removal of mature trees have simplified the forest structure, leading to a significant decline in saproxylic insect populations. As a result, these species occur in only a limited number of forest stands relative to their potential distribution, and they are isolated from patches of old-growth forest that serve as crucial habitat. Furthermore, until recently, in Romania saproxylic species were deemed pests in conventional forestry practices due to their negative impact on timber value. Commonly, these practices used to advocate the reduction to maximum of the amount of deadwood by isolating stands that harbor a rich diversity of saproxylic beetles.

In 2020, European Commission LIFE Programme financed the project LIFE19 NAT/RO/000023 LIFE ROsalia Conservation of saproxylic beetles in the Carpathians, an initiative aimed to stop and reverse the loss of protected saproxylic beetles (*Rosalia alpina*, *Osmoderma eremita*, *Cerambyx cerdo*, *Morimus funereus*, and *Lucanus cervus*) in the Carpathians by demonstrating conservation actions for increasing the connectivity of favorable habitats in Natura 2000 site ROSCI0208 Putna-Vrancea (Eastern Carpathians, Vrancea County, Romania), and transferring and replicating best management practices in other Romanian Natura 2000 sites (e.g. creating a next generation of veteran trees in areas lacking suitable habitats and providing artificial and natural deadwood habitats to facilitate reproduction and dispersal).

The project LIFE ROsalia will be implemented until 2026 by the EPA Vrancea, University of Bucharest, Putna-Vrancea Natural Park Administration, and Association for Biodiversity Conservation (see www.liferosalia.ro).

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Monitoring beetles communities and habitats in the Carpathians Vrancea

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Key words: saproxylic insects, beetle communities, habitat composition, Putna-Vrancea.

The LIFE project ROsalia aims to stop and reverse the decrease of saproxylic beetle populations in the Carpathians by enhancing habitat connectivity in ROSCI0208 Putna-Vrancea (Eastern Carpathians, Romania) and applying these measures in other Romanian Natura 2000 sites (Mirea et al., 2021). An essential step involves monitoring the beetle populations and communities in the primary habitats of the study area.

Between 2021-2023, we used non-lethal traps across various sites to monitor saproxylic beetle communities. We used flight interceptor traps baited with specific pheromones and conducted habitat sampling to map tree species and microhabitats. Regarding the monitoring of saproxylic insect species and insect communities, their diversity in 2021 amounted to 14 families, 47 species and 466 specimens, in 2022 - 15 families, 43 species, 209 specimens and in 2023 - 14 families, 47 species and 268 specimens. Following the monitoring, we obtained a statistic of the presence and number of specimens of the LIFE ROsalia target species, in 2021 all 5 priority species were identified and monitored, in 2022 the species *Rosalia alpina* and *Osmoderma eremita*, and in 2023, the species *Rosalia alpina*, *Osmoderma eremita* and *Lucanus cervus*.

The diversity of the habitats monitored has a majority composition of beech, fir and oak. Therefore, rich diversity and abundance of insects are shown by the monitoring findings, contributing to the advancement of a national action plan for their protection and closing the information gap in Romania.

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Estimating the potential impact of the Asian hornet, *Vespa velutina*, in Romania

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Key words: alien species, invasive species, pollinators, yellow-legged hornet, Europe, biotic interactions

The Asian hornet (*Vespa velutina* Lepeletier, 1836), an invasive species native to Southeast Asia, was accidentally introduced to Europe and parts of Eastern Asia. Since its introduction in France in 2004 (Monceau et al., 2014), *V. velutina* has rapidly spread to neighboring areas and, by 2022, has been documented in at least 10 European countries (Lioy et al., 2022). Its potential arrival and spread in Romania are a cause for concern due to the environmental and socio-economic impacts observed in other invaded regions (Laurino et al., 2020).

To assess the potential ecological consequences of *V. velutina* in Romania, we collected data from various sources, i.e. scientific publications and citizen science, and built a comprehensive database of biotic interactions between the hornet and other species (Preda & Groom, 2021; Lioy et al., 2022). This dataset, which includes more than 2500 records of approximately 430 interactions, with 65% identified at the species level, was contributed to the open Global Biotic Interactions (GloBI) platform, enhancing its utility for researchers studying invasive species worldwide (Poelen et al., 2014). We used these data to visualize the network of interactions of *Vespa velutina* and to assess its potential impact in Romania. Our findings emphasize the value of species interaction networks in understanding the broader effects of invasive species and highlight the need for effective monitoring and control strategies to prevent the spread of *V. velutina* and mitigate its adverse effects on biodiversity and ecosystems.

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Toxicity and biological activities of a Copper(II) Thiosemicarbazone Complex

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Key words: coordination compound, thiosemicarbazone, toxicity antioxidant activity, antiproliferative activity.

This study aimed to assess the toxicity of antiproliferative activity (APA) and antioxidant activity (AOA) of copper(II) Complex (Cu(L-H)Br) and Thiosemicarbazone (HL) on *Daphnia magna* (Straus, 1820).

The Complex Cu(L-H)Br, where HL is (2*E*)-*N*-(2,4-dimethylphenyl)-2-(2-hydroxy-3-methoxybenzylidene)hydrazinecarbothioamide, was synthesized and characterized using FT-IR, ^{1}H NMR, ^{13}C NMR spectroscopy, elemental analysis, EPR spectroscopy, molar electrical conductivity, and single crystal X-ray diffraction.

Cu(L-H)Br and HL showed high AOA, surpassing Trolox, with IC_{50} values of 6 and 11 μM, respectively. The APA against BxPC-3 cells for Cu(L-H)Br and HL was 7 and 100 μM, respectively, with both showing IC_{50}>100 μM against MDCK cells. Importantly, neither compound exhibited toxicity to Daphnia at 50 μM.

These results indicate that Cu(L-H)Br and HL offer promising applications in fields such as ecology and biodiversity conservation. The significant antioxidant properties suggest potential use in mitigating oxidative stress in various organisms, contributing to healthier ecosystems. Moreover, the lack of toxicity to *Daphnia magna* at reasonable concentrations underscores their environmental compatibility, making them suitable for use in delicate aquatic environments where maintaining ecological balance is critical. The selective antiproliferative activity against specific cancer cell lines, alongside non-toxicity Madin Darby Canine Kidney epithelial normal MDCK cell line, highlights their potential as safer alternatives in therapeutic applications with minimal ecological disruption.

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Macroinvertebrates of the Low Prut River lakes (Republic of Moldova)

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Key words: Beleu, Manta, species diversity, Ramsar Site.

The study of macroinvertebrates was carried out during 2014-2024 in Lakes Beleu and Manta, located along the Prut River, in the southern part of the Republic of Moldova, near the Danube Delta. Lake Beleu is a shallow relict, the largest (area 6.26-9.50 km²) natural lake in the Republic of Moldova, which is connected to the Prut River by four branches. This lake belongs to the Lower Prut Lakes Ramsar Site (No. 1029. 19,152 ha. 45°42'N, 28°11'E). Lake Manta was formed from several former natural lakes, connected by channels. This is one of the most important wetlands for our country. Lakes Beleu and Manta are natural floodplain water bodies with unique ecosystems.

As a result of investigation more then 100 taxa of benthic macroinvertebrates were identified, which belong to the following groups: Nematoda, Oligochaeta, Hirudinea, Crustacea, Gastropoda, Bivalvia, Ephemeroptera, Odonata, Heteroptera, Coleoptera, Trichoptera, Chironomidae, and other groups. *Hirudo medicinalis* Linnaeus, 1758 has been recorded for the first time in Lakes Beleu and Manta and adjacent channels in 2024. Larvae of *Sympecma fusca* (Vander Linden, 1820) have been firstly registered in Lake Manta in 2024.

Unfortunately, the condition of this Ramsar site is negatively affected by significant anthropogenic pressures and climate change. The water depth in these water bodies in the summer of 2024 was about 0.3-0.5 m, which is several times less than usual; in the channels the depth is about 1 m. Thus, it is the decrease in water level in recent years that has become the main negative factor for the development of macroinvertebrates.

The study was supported by the subprogram 010701, and "Assessment of the state of plant, fungi and animal species, development of the list of species with rarity status and the algorithm for their presentation in the 4th edition of the Red Book of the Republic of Moldova".

Structural and functional differences in macroinvertebrate communities upstream and downstream of small hydropower plants intake points

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Key words: macroinvertebrate communities, traits, small hydropower plants, intake points, Romania.

Macroinvertebrate communities, composed of permanent and temporary species with diverse strategies, support a wide range of aquatic and terrestrial consumer populations by transferring matter and energy. Their species and traits diversity makes them effective indicators of aquatic system health. Moreover, their ease of collection makes macroinvertebrates commonly used in monitoring programs. As a result, the response of macroinvertebrate communities to certain anthropogenic pressures, such as organic pollution has been well documented. Instead, for other types of anthropogenic pressures, such small hydropower plants construction and operation, research remains more limited and more focused on the structural response of macroinvertebrate communities, overlooking the importance of functional aspects.

Our research focused on assessing the structural and functional differences of macroinvertebrate communities upstream and downstream to 33 intake points of 17 small hydropower plants (SHPs) in the Carpathian Mountains in Romania. The study was conducted in 2019 across streams in four hydrographic basins (Argeș – Vedea, Olt, Banat, Jiu) and included two sampling periods: May – June and August – September. To estimate the structural (taxonomic) and functional (feeding behavior) composition of macroinvertebrate communities, we used specific indices, including abundance, relative abundance, richness, Shannon diversity, and evenness. Their values were used to identify the differences between the upstream and downstream sections of intake points and to link these differences to hydromorphological and physical-chemical changes. The most significant differences were revealed at the functional level. This research emphasizes the importance of considering multiple species traits in environmental studies focused on small

hydropower plants, in order to assess their impact comprehensively and accurately. Future analyses should consider both more traits and more sampling moments.

Species of phytoplankton and zooplankton as indicators of water quality in the Dubasari Reservoir, Republic of Moldova

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Key words: phytoplankton, zooplankton, species-indicators, water quality.

The results of the hydrobiological investigations carried out in the Dubasari Reservoir, Republic of Moldova during the course of fifteen years are presented here. The diversity and structural parameters of the phytoplankton and zooplankton are indicators of the degree of water pollution. From phytoplankton composition (109 species) of Dubasari Reservoir, 62 species, are species-indicators of water saprobity, which are in proportion of 61% typically beta-mezosaprobic, which were presented in more cases by species: *Anabaena flos-aquae* (D.Saunders, 1894), *Aphanizomenon flos-aquae* (Ralfs ex Bornet, 1886) from the Cyanophyta (Cyanobacteria) phylum; *Cymatopleura elliptica* (Brébisson,1851)*, Cymbella lanceolata* (C.Agardh, 1830)*, Cyclotella kuetzingiana* (Thwaites, 1848)*, Diatoma vulgare* (Bory, 1824)*, Synedra acus* (Kützing, 1844)*,* from the Bacillariophyta phylum; *Trachelomonas hispida* (F.Stein, 1878) from Euglenophyta phylum and *Scenedesmus quadricauda* (Brébisson, 1835) from the Chlorophyta phylum.

From the total number of 199 zooplankton species registered in the Dubasari Reservoir, 180 species, or 90%, were indicator species of water saprobity. Zooplankton, as a saprobic valence of the ecosystem, turned out to be extremely diverse, comprising a wide spectrum of indicator species – from oligo-saprobes to alfa-mesosaprobes and poli-saprobes. In zooplankton community of the Dubasari Reservoir, oligo-saprobe species account for 40% which were: *Colurella colurus* (Ehrenberg, 1830), *Kellicottia longispina* (Ahlstrom,1938), *Mesocyclops leuckarti* (Claus, 1857), *Camptocercus uncinatus* (Smirnov, 1971); oligo-beta-mezosaprobe species contains 32%: *Euchlanis dilatata* (Ehrenberg, 1832), *Notholca squamula* (Müller, 1786), *Pleuroxus uncinatus* (Baird, 1850); and beta-mesosaprobe species were presented in 24%: *Brachionus quadridentatus* (Herman, 1783), *Eucyclops serrulatus* (Fischer, 1851), *Macrothrix laticornis* (Jurine, 1820).

The values of saprobic indexes, estimated on the basis of species-indicators confirm the following: that the water quality of Dubasari Reservoir in the period of study was satisfactory for the development of phytoplankton and zooplankton and was attributed mainly to II-III (good-moderately polluted) quality classes.

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Ectoparasitic infestations in geese (*Anser anser domesticus* L.) from the Central area of the Republic of Moldova

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Key words: geese, ectoparasites, malophages, fleas, gamasid mites, ticks.

As a result of the parasitological studies carried out over several years, it was established that both domestic and wild birds, as well as mammals, are infested with various species of ectoparasites: 300 malophagous species, which taxonomically belong to the order Amblycera and Ischnocera, the family Menoponidae and Philopteridae, 2 species of fleas and 2 species of gamasid mites. At the same time, parasitation of 18 species of malophages was recorded in domestic birds (Lunkashu, M., et al., 2003, 2008)

Infestation of domestic palmipedes from the family Anatidae (geese) was recorded, with 10 species of parasitic agents, which taxonomically belong to 2 classes - Insecta and Arachnida, 6 families - Trinotonidae, Philopteridae, Menoponidae, Lipeuridae, Dermanyssidae, Argasidae and 7 genera - *Anatoecus, Anaticola , Trinoton, Menopon, Lipeurus, Dermanyssus, Argas*.

From the Central area of the Republic of Moldova, 249 biological samples were collected from geese (*Anser anser domesticus L.*). Their infestation with 8 species of malophages ((*Trinoton querquedulae* (Linnaeus, 1758)*, Trinoton anserinum* (Fabricius, 1805), *Anatoecus adustus* (Nitzsch in Giebel, 1874), *Anatoecus icterodes* (Nitzsch, 1818), *Anaticola crassicornis* (Scopoli, 1763), *Anaticola anseris* (Linnaeus, 1758)*, Menopon obscurum* (Piaget, 1880), *Lipeurus caponis* (Linneus, 1758)), one species of gamasid mites (*Dermanyssus gallinae* (De Geer, 1778)) and one species of argasid ticks (*Argas persicus* (Oken,1818)) was determined. Of the species established in geese, one species of mite (*Lipeurus caponis*) is common to domestic and wild Gallinaceae, 2 species of mites: *Argas percicus* - parasitizes wild and domestic gallinaceae, and the species *Dermanyssus gallinae* - is common to several species of domestic and wild birds, and mammals, including humans.

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The investigations were carried out with the support of the institutional project - State Program with the theme: "Diversity of hematophagous arthropods, zoo- and phytohelminths, vulnerability and strategies for toleration of climatic factors, development and implementation of innovative procedures for comprehensive control of species of community interest". with code: 20.80009.7007.12 F and of the Subprogram with code 010701 "Evaluation of the structure and functioning of biocenoses, aquatic and terrestrial habitats under the influence of biotic and abiotic factors in the context of ensuring ecological security and the well-being of the population", within the USM.

Investigation of the individual and combined toxicological effects of valproic acid and meropenem treatments on zebrafish behavior using environmentally relevant doses

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Key words: zebrafish, ecotoxicology, behavior, pollution.

Medications are crucial for human well-being, but if they are not disposed of correctly or are released into wastewater, they have the potential to pollute the environment. This is alarming because wastewater treatment facilities are incapable of eliminating all drugs. Consequently, polluted wastewater has the potential to infiltrate rivers, lakes, and even sources of drinking water (Yin et al., 2016), thereby causing apprehension over the purity of water, the well-being of aquatic species (Mauro et al., 2021), and the overall ecosystem. This study examined the impact of two drugs, valproic acid and meropenem, on zebrafish (*Danio rerio*), using environmental concentrations. The results indicated that fish exposed to valproic acid exhibited more exploration of their environment; however, they also displayed a higher tendency to remain at the bottom of the aquarium, a behavior commonly associated with fish feeling stressed. During the sociability test, the groups that received treatment showed greater levels of exploration. However, social activity decreased when treated with valproic acid, whereas it increased when treated with meropenem and in mixed treatments. The concurrent presence of valproic acid and meropenem in water has a more significant effect on social interaction compared to each treatment individually, highlighting the possibility of heightened environmental risk. Overall, the study's conclusions point to the possibility that drugs in water may change fish behavior and, therefore, have an impact on their survival. Fish may become more susceptible to predators and experience a decrease in their capacity to locate food and mates due to anxiety-related behaviors and alterations in swimming patterns. This underscores the significance of appropriate drug disposal and enhanced wastewater treatment in safeguarding aquatic environments. Further research is needed to fully understand the long-term effects of pharmaceuticals in water on fish populations and ecosystems.

Implementing more stringent regulations on drug disposal and wastewater treatment may be necessary to mitigate potential negative impacts on aquatic life.

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The diversity of ichthyofauna in the plain area of the Râmnicu Sărat River

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Key words: Ichthyofauna, Râmnicu Sărat River, Fulton's condition factor.

This study is dedicated to identifying fish species in the plain area of the Râmnicu Sărat River and evaluating their health status. The Râmnicu Sărat River originates from under the Furu peak and flows into the Siret River, near the village of Măicănești. The plain area through which this river flows begins near the municipality of Râmnicu Sărat and extends to the vicinity of Măicănești.

A detailed analysis was conducted on a sample of 619 individuals, identifying 8 fish species, with data collected on the weight and total length of each specimen. The collected data were used to calculate the variation in weight and total length of the studied specimens, as well as the variation of the Fulton condition factor, an indicator used to assess the nutritional and health status of the fish.

The analysis of these variations allowed the identification of significant trends regarding the health status of the ichthyofauna in the Râmnicu Sărat River. For example, observations on the variation in weight and length can indicate the effects of environmental factors on fish growth and development, while variations in the Fulton condition factor may suggest changes in the availability of food resources that influence the health status of the populations.

The results obtained from this study provide a comprehensive overview of the distribution of fish species and their health status in the Râmnicu Sărat River, thus contributing to efforts to monitor and manage native species. This information can be essential for developing effective environmental protection strategies and maintaining aquatic biodiversity in the region.

DNA barcoding application in study of icthyo-biodiversity in Rivers of Pakistan

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Key words: DNA barcoding, freshwater fishes, taxonomy, biodiversity, Pakistan.

Fish taxonomy plays a fundamental role in the study of biodiversity. However, traditional methods of fish taxonomy rely on morphological features, which can lead to confusion due to great similarities between closely related species. To overcome this limitation, modern taxonomy employs DNA barcoding as a species identification method. This involves using a short standardized mitochondrial DNA region as a barcode, specifically a 658 base pair fragment near the 5′ end of the mitochondrial cytochrome c oxidase subunit 1 (CO1) gene, to exploit diversity in this region for identification of species. To test the effectiveness and reliability of DNA barcoding, 25 fish specimens from nine different fish species found in various rivers of Pakistan were identified morphologically using a dichotomous key at the start of the study. Comprising nine fresh water fish species including *Mystus cavasius, Mystus bleekeri, Osteobrama cotio, Labeo rohita, Labeo culbasu, Labeo gonius, Cyprinus carpio, Catla catla* and *Cirrhinus mrigala* from different rivers of Pakistan were used in present study. DNA was extracted from one of the pectoral fins and a partial sequence of CO1 gene was amplified using conventional PCR method. Analysis of the barcodes confirmed that genetically identified fishes were the same as those identified morphologically at the beginning of the study. The sequences were also analyzed for biodiversity and phylogenetic studies. Based on the results of the study, it can be concluded that DNA barcoding is an effective and reliable method for studying biodiversity and conducting phylogenetic analysis of different fish species in Pakistan.

Considerations on the structure of the fish fauna of the Râmnicu Sărat River (South-Eastern Romania) in the period 2023-2024

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Key words: fish fauna, biodiversity, Râmnicu Sărat River.

The study was carried out over a period of 2 years on the main course of the Râmnicu Sărat River and on some of its tributaries, and it aimed to investigate the diversity of fish fauna. The need for this study arises from changes in environmental conditions resulting from the influence of anthropogenic activities (i.e. road infrastructure works).

Twenty-nine sampling points have been scientifically investigated (13 in 2023, and 16 in 2024). Sampling was carried out by legal methods, respecting the principles of rare species protection.

Taxonomic analysis revealed the presence of 17 fish species (16 in 2023, 14 in 2024), belonging to 3 orders and 7 families. One of these is a non-native species: *Pseudorasbora parva*.

The study revealed some interesting aspects in the structure of fish communities, relative to the past decades and probably influenced by the actual environmental conditions. Thus, we note that 3 of the fish species present in the study area in 2023 were no longer identified in 2024.

On the other hand, in 2024 a new species was identified that was not present in 2023 – *Cobitis taenia*.

The minnow and the common frog: a story of smooth cohabitation?

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Key words: alpine lakes, fish introductions, impact, Retezat Mountains.

Fish stocking represents a major driver of biodiversity loss in naturally fishless aquatic ecosystems. Alpine lakes and the species associated with these ecosystems are especially sensitive, since they lack the coping mechanisms to coexist with novel species. Trout was a common fish actively introduced in European alpine lakes for fishing, followed by accidentally introduced small bait species, mostly minnows. In the alpine lakes from Retezat National Park the minnow, *Phoxinus phoxinus*, persisted in many alpine lakes, even after the disappearance of the introduced trout. The common frog, *Rana temporaria*, is one of the few amphibians breeding in alpine lakes. Tadpoles of this species can also be observed in alpine lakes with fish. However, we don't know the biological costs that tadpoles are subjected to, as a consequence of this cohabitation. Thus, we investigated the potential effects induced by the presence of minnows during the early developmental stages of the common frog, using a mesocosm experimental setup, in Retezat National Park, Romania. We compared (1) growth rates and activity patterns in G26-40 tadpoles, and (2) size, body condition and endurance in metamorphs, between common frog individuals raised in the presence versus absence of minnows. We found that tadpoles raised in the presence of minnows were on average significantly faster (i.e., velocity) and more active (i.e., distance covered) compared to those raised in the absence of fish. Growth rates in tadpoles, and size, body condition and endurance in metamorphs were similar in both experimental treatments (i.e., with fish/ without fish). The increased activity of tadpoles raised in the presence of fish and the lack of modifications in growth rates, size and fitness, suggests that common frogs use a behavioural strategy to avoid trade-offs in size and fitness at metamorphosis, when exposed to an omnivorous fish, like the minnow.

Are amphibians affected by fish stocking in mountain lakes? From co-occurrence to predation

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Key words: fish introduction, biotic interactions, predation, Anura, Caudata.

Amphibians are the most threatened vertebrates in the world. Thus, alterations of their natural habitats can determine imbalances in their reproductive success, time to metamorphosis or even survival. During the past decades, a substantial part of the aquatic ecosystems occupied by the amphibians, including the mountain lakes, have been stocked with fish. This raises serious concerns since fish introductions have a negative effect on water quality, ecosystem functioning and biodiversity in general.

We aimed to document how fish stocking affects the amphibian communities in the most studied mountain ranges around the globe. For this, we reviewed the literature, and extracted 593 biotic interactions occurring between introduced fish and native amphibians, in mountain lakes at altitudes up to 3583 m a.s.l., in a standardized way.

Seventy studies, conducted in mountain lakes from Europe, Canada and USA, highlighted a negative impact of 24 fish species on 33 amphibian species. The impact was either direct, i.e., fish prey, outcompetes or eliminates the adult amphibians, tadpoles or eggs, or indirect, when fish determined alterations in habitat structure and impoverishment of aquatic communities. Nine other studies conducted in the same regions of the world reported a neutral impact of fish (*Salmo trutta*, *Salvelinus fontinalis*, *Oncorhynchus clarkia*, *O. mykiss*) on amphibians, both on anura (*Rana muscosa, R. temporaria, R. luteiventris, Bufo spinosus, Pseudacris regilla, Anaxyrus boreas*) and caudata (*Ambystoma macrodactylum, Euproctus platycephalus*). Only one publication reported a positive effect of the introduction, where individuals of bluegill fish (*Lepomis macrochirus*) were observed to feed on macroinvertebrates commonly preying on *Lithobates catesbeianus* tadpoles in the USA.

Herpetofauna trends in the Republic of Moldova in the context of climate and social-economic changes

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Key words: Herpetofauna, Republica Moldova, trend, climate change.

The results of the research are presented regarding the trends and changes occurring in the herpetofaunal communities in the context of climate and social-economic transformations from the last decades. Based on the scientific importance and, at the same time, the vulnerability of reptile and amphibian species, the studies were oriented towards highlighting the impact of negative factors and determining the importance and priority of various ecosystems for maintaining herpetofaunal diversity. Data regarding the distribution of amphibian and reptile species on the territory of the Republic of Moldova were obtained for a long-term period.

The current herpetofaunistic complex in the Republic of Moldova was formed due to the position of the territory at the interference of three biogeographic zones that actually coincide with the geobotanical zones – Central European (represented by deciduous forests), Eurasian (represented by steppes) and Mediterranean (represented by xerophyte forests of downy oak). Therefore, the local populations of most species exist at the limit of their range, thus increasing their vulnerability.

The anthropic impact and climatic factors of recent years have led to essential changes in the biotope structure of the ecosystems and, as a result, to the structural changes of the faunal communities in general and of the herpetofauna in particular. Factors such as deforestation, excessive use of pastures, aridification of lands, lead to the degradation and reduction of natural ecosystems, causing the fluctuation and reduction of areas. For example, the species *Rana dalmatina*, *Rana temporaria*, *Bufo bufo*, *Emys orbicularis*, *Dolichophis caspius*, *Zamenis longissimus*, *Coronella austriaca*, *Vipera berus* are less tolerant to climate changes and anthropogenic impact and have a tendency to reduce their ranges. The tendency of population fragmentation and insularization is more pronounced in the steppe zone in the south and north of the republic.

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Reproductive characteristics of the European grass snake (*Natrix natrix*) from the Lower Danube Basin

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Key words: clutch size, clutch weight, egg-laying timing, reproductive success, melanism.

Understanding the reproductive traits of reptile populations is an important aspect of their population biology. This study examines the reproductive characteristics of the European grass snake (*Natrix natrix*) in the Lower Danube Basin, focusing on the egg-laying timing, clutch size, egg weight, and the relationship between the female body size and their respective reproductive output. Additionally, the study aims to explore how female phenotype (especially focusing on melanistic versus non-melanistic individuals) influences these reproductive traits. During field campaigns in May and June 2023, and June 2024, 34 pregnant females were collected from three populations (Sfantu Gheorghe, Histria and Ciric) and brought to the laboratory and kept in the same conditions. Our findings reveal that egg-laying in *Natrix natrix* occurs within a consistent temporal window (end of June - beginning of August), with egg weight (4.63 ± 0.88 g) and clutch size (15.06 ± 3.46 eggs/clutch) exhibiting significant variation across individuals. A positive correlation was observed between female body size and the number of eggs laid, indicating that larger females tend to produce larger clutches. Furthermore, small differences in reproductive output between melanistic and non-melanistic females was observed, with lower values in clutches from melanistic females. These results provide valuable insights into the reproductive biology of *Natrix natrix* and highlight the importance of phenotype on reproductive success in wild reptile populations.

New observations of saurophagy in smooth snakes (*Coronella austriaca*) from Romania

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Key words: *Coronella austriaca*, *Natrix tessellata, Anguis fragilis,* saurophagy, feeding behavior, trophic spectrum.

The smooth snake (*Coronella austriaca*) is a small-sized colubrid (usually less than 80 cm total length) with a wide Palearctic distribution, including Romania. Both the eastern slow worm (*Anguis colchica*) and the dice snake (*Natrix tessellata*) are widespread in Romania, and frequently occur in sympatry with the smooth snake.

Here we report two cases of predation involving smooth snakes: (1) on the 10th of May 2023 an adult smooth snake was observed constricting an adult eastern slow worm on the parkway leading to Deva Fortress (Hunedoara county, Romania) and (2) on the 11th of May 2023 an adult smooth snake was observed ingesting a subadult (ca. 60 cm total length) dice snake on the shore of Cerna Dam lake, close to Băile Herculane resort (Caraș-Severin county, Romania).

According to existing studies, the species' trophic spectrum includes mainly lizards (up to 70% of its diet), occasionally preying on mammals, small birds, snakes and even insects. While the slow worm is known as a frequent prey item for the species, ophiophagy is less frequent and only the grass snake (*Natrix natrix*) and the European adder (*Vipera berus*) have been recorded as potential prey items. Natural history observations are important pieces to understanding all facets of a species' biology and to our knowledge this is the first time the dice snake has been confirmed as prey for the smooth snake.

Field evidence for the selective pressures on coloration in a European viper (*Vipera nikolskii*): insights from predator-prey interactions

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Key words: *Vipera nikolskii*, melanism, coloration, predation-prey interaction.

Animal colorations are adaptations to various biotic and abiotic factors, crucial for predator avoidance, communication, and sexual selection. In ectothermic animals, coloration also significantly influences thermoregulation. The thermal melanism hypothesis states that darker individuals in ectothermic species are better at thermoregulation than lighter individuals. However, nearly all-black (melanistic) individuals may lose the cryptic or warning signals provided by patterned coloration, making them more susceptible to predation. Although these statements hold true for some species and populations, there are exceptions, such as the lowland southern clades of the *Vipera berus* complex, where melanism is prevalent in polymorphic populations or where entire populations consist solely of melanistic individuals.

We aimed to experimentally test whether coloration type is relevant for predator-prey interactions (i.e., vipers being the prey) in a polymorphic population of *Vipera nikolskii* from northeastern Romania and a melanistic population from southern Romania. Using methods proven successful in previous studies, we installed 465 viper replicas made of plasticine in the field within habitats known to be inhabited by vipers. Of these, 50% featured a typical zigzag pattern (patterned), while the remaining 50% were completely black (resembling melanistic vipers). To eliminate the role of crypsis, 50% of all models were placed on a white sheet of cardboard. Replicas were inspected for predation events every 48 hours and retrieved after a total of 10 days in the field. Our preliminary results indicate a significantly higher predation rate on melanistic individuals in the polymorphic population, while in the purely melanistic one, the frequency of attacks was similar between melanistic and zigzag replicas. Our findings show that the high frequency of melanism in these populations is not due to relaxed predation pressure on melanistic individuals.

Comparative analysis of activity and microhabitat selection in *Lacerta agilis* and *Lacerta viridis* in David's Valley Nature Reserve, Iași

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Key words: microhabitat preference, *Lacerta agilis*, *Lacerta viridis*, species-specific factors.

Understanding niche segregation through microhabitat selection is crucial for explaining species coexistence at local scales. This study examines the activity patterns and microhabitat preferences of two European lizard species, *Lacerta agilis* and *Lacerta viridis*, from David's Valley Nature Reserve. The research has two main objectives: to identify the species-specific factors that influence how the lizards interact with the environment, and to determine whether there are significant differences between the two species at the site.

Field observations have been conducted from April to August 2024 across six systematically surveyed one-hectare plots, and the study is ongoing until October 2024. For each lizard encounter, data on individual sex, age, and behavior were recorded, along with five environmental variables (soil temperature, humidity, vegetation cover, vegetation height, and microhabitat features).

Preliminary results from the first four months documented 88 individual lizards, comprising 36 *Lacerta agilis* and 52 *Lacerta viridis*. Both species showed peak activity between 10:00 and 12:00, with consistent observations throughout the day. *Lacerta agilis* favored habitats with soil temperatures around 24.9°C, 53% relative humidity, 40% vegetation cover and 30 cm vegetation height. *Lacerta viridis* preferred slightly warmer conditions (26.8°C), higher humidity (63.1%), 40% vegetation cover, and 20 cm vegetation height.

Preliminary analysis revealed small differences between the species in the measured environmental variables, suggesting potentially weak niche segregation and intense competition for basking spots during the reproductive season.

Slope direction, elevation and clutch size influences breeding success of Kalij Pheasant (*Lophura leucomelanos*) in Margalla Hills National Park

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Key words: breeding biology, incubation, kalij pheasant, Margalla Hills National Park.

Kalij pheasant (*Lophura leucomelanos*) is endemic to Pakistan and recognized as flagship species of Margalla Hills National Park (MHNP), Pakistan. Data on breeding biology of kalij pheasant in MHNP is not available. Therefore, the present study was conducted to document the breeding parameters and influence of slope, aspect, elevation and clutch size on breeding success. Kalij pheasant builds nests with needles of chir pine *Pinus roxburghii* (65% by mass), oak leaves *Quercus incana* (20%), sticky hop bush *Dodonaea viscosa* (5%) and munj sweetcane *Saccharum bengalensis* (5%) on ground and can be found in natural vegetation viz; phulai *Acacia modesta,* sticky hop bush, Indian olive *Olea ferruginea,* shisham *Dalbergia sisso* and boxwood *Buxus papillosa*. Breeding takes place in February to June and clutch size of 6.42 ± 0.30 eggs was recorded. Hatching success was recorded highest in nests with seven-egg clutches (52.57%). Multiple regression analysis shows that slope and elevation influence ($P<0.05$) nesting success. Kalij pheasant builds a higher number of nests on the North facing slope at higher elevation as compared to the South facing slope. Only females incubated and brooded the eggs, eggs were hatched synchronously after 24.12 ± 0.07 days of incubation. Breeding success was recorded as 45%. Daily nest survival probability (0.992) and total survival probability were recorded 0.833 for kalij pheasant. Mongooses *Herpestes javanicus* and jackals *Canis aureus* predated the eggs. It is concluded that breeding activities of kalij pheasant are in good condition and slope elevation and clutch size influences the breeding success. This is the first ever report on the breeding status of kalij pheasant in Pakistan.

Use of ornithochoria in Agro-ecology: Case of the European starling *Sturnus vulgaris*

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Key words : *Sturnus vulgaris,* growth, efficiency, concentration, agro-ecology.

The study aims to evaluate the inhibiting effect of different concentrations of European starling *Sturnus vulgaris* droppings on the development of weeds with the aim of minimizing the use of chemicals. This agro-ecological approach makes it possible to explore the possibilities of using European starling droppings depending on the concentrations applied as herbicides to inhibit the growth of weeds. The droppings of the European starling were collected from the beginning of November 2022, and after being dried in the open air, they were used as a herbicide. This product was evaluated at three distinct concentrations: 25%, 50%, and 75% droppings, in addition to a control group, and its performance was compared to that of a total chemical herbicide to determine its effectiveness in the weed control. It should be noted that this study represents the first attempt to recycle animal waste in an agro-ecological approach. The effectiveness of the bioherbicide was remarkable, particularly for the product containing 75% droppings, when compared to a chemical herbicide. It is clear that our organic product can advantageously replace chemical herbicides, providing a promising and more environmentally friendly alternative for weed management. This study suggests an innovative approach for the use of starling droppings in agriculture, providing a dual-use solution as a biofertilizer and bioherbicide. Optimal effectiveness varies depending on the concentration of droppings, with 25% droppings being the preferred choice for promoting crop growth, while with 75% droppings these bioproducts are more suitable for weed management before the establishment of a culture. This flexibility allows farmers to adapt their use according to their specific needs, thereby contributing to more sustainable agriculture. However, it should be noted that these results require further research to know the long-term impacts of using manure as a source of nutrients for crops.

Historical and current occurrences of Long-legged Buzzard *Buteo rufinus* in Romania

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Key words: Long-legged Buzzard, Romania, museum records, ornithology database, phenology, occurrence data.

The geographic distribution of the Long-legged Buzzard (*Buteo rufinus*) in Romania has expanded during the last decades. Understanding a species' distribution patterns is crucial for identifying critical habitats and regions that require protection, in order to conserve the species and maintain biodiversity. Furthermore, the study of phenological distributions serves to enhance our understanding of the species' biology, ecology, and interactions with the environment.

The aim of our study is to gather a complete dataset regarding the presence of the Long-legged Buzzard in Romania, including all the available historical occurrence data (i.e., between 1891–2000) and recent observations (i.e., between 2001–2023). Those were used to map Long-legged Buzzards' observations and to show the occurrences of the species according to phenological periods of the year, in the different regions of Romania. We mapped the distribution of the Long-legged Buzzards between 1891 and 2000, and found that the species was present during this period in the similar regions of Romania as the ones from where recent observations were undertaken, i.e., between 2001 to 2023. However, after the year 2000 considerably more observations are available, indicating a potential expansion of the species and/or an increased sampling effort. Furthermore, contrary to the previous assumptions, our data revealed that the species is present in recent time in each phenological period of the year, that is, pre-breeding, breeding, post-breeding, wintering, in all regions. Overall, our comprehensive dataset may be the foundation of future works aiming to reveal details about the potential expansion rate, and the temporal and spatial distributions of the species over the last century.

Molecular Identification of Pakistani Predatory Birds through analysis of ND2 mitochondrial gene

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Key words: Phylogeny, birds of prey, falcons, shikra, hawks.

Pakistan is gifted with a variety of habitats and climatic conditions which leads to a diverse range of avian species. Among the avifauna of Pakistan, birds of prey or raptors are well-known because of their beauty and speed of flight. Falcons, hawks, kites, eagles, and vultures are common birds of prey. They are geographically widespread and the most common of all vertebrates. Being predatory birds, they are found at the top of the food chain. Unfortunately, birds of prey are facing serious threats such as loss of habitat, pollution, poaching and injuries. In order to maintain ecological balance and food chains, it is very important to establish strategies for conservation of these predatory birds. However, there is still uncertainty in their taxonomy because these birds are not well studied at genetic level. Morphological identification includes size, color, and body weight etc. which are crude measurements and does not lead to accurate identification at species level. In order to overcome such gaps, the aim of this study was the identification of two broad families of raptors, Accipitridae and Falconidae, at molecular level using mitochondrial ND*2* gene. The partial sequence of ND2 gene was submitted to GenBank. The novel SNPs were investigated and they serve as markers for identification of Pakistani raptorial species. Two subspecies of falcons are also characterized at genetic level for the first time. This study has not been conducted yet in Pakistan. This strategy can be used to identify other species of birds of prey to get diverse genetic data which will be helpful for the conservation planning of these birds and ultimately play a role in the maintenance of the ecosystems.

Synanthropisation process of bird species in Chişinău municipality, Republic of Moldova

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Key words: ornitofauna, synanthropisation index, urban environment, protection, Chişinău municipality.

The present research deals with the trend determination of synanthropisation process of bird communities to urban landscape in Chişinău municipality of the Republic of Moldova. The synatnhropisation degree of the bird species from the urban environment was revealed. In total, 89 bird species were identified. In accordance with the classification of Klausnitzer (1988), the highest share belongs to facultative species (56.63%) and the lowest percentage – to obligate species and partial species (7.8%). This fact proves that the urban environment offers favorable conditions similar to those from the natural environment to the species with a high degree of ecological plasticity and offers them the possibility to find appropriate conditions for breeding and feeding in the city parks and squares. Using the synanthropisation index (Jedryiczkowski, 1979) we established that the highest level (W_s – 1) was registered at village boundaries in the summer season. This fact is due to the less intense influence of the human factor in rural localities than in urban environments. In the same period in city districts with tall buildings, the value of index is 0,57. The lowest value of synanthropisation index (W_s – 0.11) was registered in the residential sector, which is conditioned by the migration of birds on the boundaries of the city, closer to the agricultural lands. The change in the synanthropisation index in some species indicates their high ecological plasticity, which is characterized by the ability of species to adapt to constant changes in the anthropogenic environment.

The synanthropisation process can be considered as a creation of a new ecological niche. The new conditions created in the urban environment and specific ecosystems can contribute to the ornitofauna protection.

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BirdNET Analyzer - A tool for monitoring natural recolonization of birds species in inactive quarries

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Key words: biodiversity, machine learning, bird sound recognition, passive acoustic monitoring.

The quarrying industry is essential for human society, despite its negative effects on biodiversity. Stone quarries and mining activities also create new habitats that are beneficial for certain species. The study was conducted in two inactive quarries from Dobrogea region. In the study area we identified four main habitat types in the adjacent area of the quarry: temporary ponds, cliffs, steppic vegetation and forest. Automated recognition software is crucial for efficient passive acoustic monitoring, as well as a cost-efficient tool in species which vocalize. To assess its impact and significance, we surveyed bird diversity using two methods: transects and audio survey using Audiomoth recorders, and compared their results. The transects included visual observation, footprints and marks (feathers, prey-bird pellets) and audio observations (of bird calls using both observer expertise and Merlin Bird ID application for mobile. The audio survey was done by setting up Audiomoth recorders and further analysis of sounds by BirdNET.

Our results showed a significant difference between the two methods in bird identification in both quarries. Our preliminary results suggest that audio surveys using BirdNET represent a powerful tool for bird surveys, having better results than just observer-based data. In conclusion, we recommend the use of sound recognition techniques for field survey and automated softwares for larger data volumes due to their efficiency, resource and time-wise.

New data on shrew (Mammalia: Eulipotyphla, Soricidae) reproduction in the Republic of Moldova

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Key words: shrews, reproduction, reproductive females, fecundity, climatic conditions.

Shrews are characterized by small body size, accelerated development rates, increased fecundity, early reproduction, smaller offspring, short lifespan and semelparity. A single breeding season is present in shrews, with the production of many sub-adult offspring towards autumn, for successful survival through the cold period ahead.

This study was performed in the 2008-2022 time period, in various types of ecosystems across Moldova. In *Sorex araneus*, *Crocidura leucodon* and *C. suaveolent* reproductive females were registered from March to October, in *S. minutus* – from March to September and in *Neomys milleri* – from April to September. The share of reproductive females was 100% of all adult females in March – June and gradually decreased toward October, when they constituted up to 9.46%. The mean embryo number varied between 3.5 and 6.67, the highest being recorded in May-June. Species of *Sorex* and *Crocidura* mature and breed rather frequently in the year they are born. In August - September, 13.2% of pregnant females were born in the current year.

Following the study of the adaptive strategies of the reproductive process depending on the climatic conditions, it was found that in the years with optimal temperature and humidity, the reproduction starts early and intensively, it is maintained at a high level until its end in August - September. In the dry years, although reproduction begins at the same time, it is much less intense: lower share of reproductive females (below 80%), lower fertility and shorter duration – the process ends in July. The average number of embryos differs significantly ($p \leq 0.05$) between optimal and dry years, and embryo resorptions reach 68.5% in dry periods. *N. milleri* proved to be the most sensitive species to humidity conditions – reproductive females (40%) were found only in May and June, and embryo resorptions reached 83.3%.

The study was performed within the subprogram no. 010701 and within the contract no. 01-23p-096/03-05-2024 financed by National Environmental Fund.

New important bat roost – Parcani limestone mines from the northern part of the Republic of Moldova

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Key words: chiropterans, hibernation roost, diversity, relative abundance, mines, Parcani.

During the winter of 2023 a new bat roost was found near Parcani locality, north-eastern Moldova. The study was performed in various following seasons: February 2023, September 2023 and May 2024. Parcani mines are located on the bank of Ciorna River in a picturesque landscape. There are several entrances and the mines are about 1 km in length along the river bank.

In February, 945 individuals from 6 bat species were registered: *Rhinolophus hipposideros*, *Myotis blythii*, *M. dasycneme*, *M. daubentonii*, *M. mystacinus* and *Plecotus auritus*. The dominant species was *M. blythii* – 84.34%, other species had an abundance between 1.38% (*P. auritus*) and 7.31% (*M. daubentonii*). *M. blythii* was hibernating in colonies ranging from several dozens to several hundred individuals.

In the middle of September, 134 individuals from 7 bat species were recorded: *Rhinolophus hipposideros*, *Myotis blythii*, *M. dasycneme*, *M. daubentonii*, *M. mystacinus*, *Plecotus auritus* and *P. austriacus*. The highest abundance was registered in *M. daubentonii* (42.25%) and *M. blythii* (49.54%), other species' abundance varied from 0.75% to 2.24%.

At the end of May only 49 individuals from 5 species were observed: *Rhinolophus hipposideros, Myotis blythii, M. dasycneme*, *M. daubentonii* and *M. mystacinus*. Dominant was *M. blythii* – 55.1%, followed by *M. daubentonii* with 20.41%, while the other species had less than 15%.

Thus, Parcani mines represent an important hibernation roost for many bat species, especially for *M. blythii*, which was registered with the highest number among other limestone mines in winter periods. During the summer the mines serve as temporary roosts.

All identified species are listed in the Red Book of the Republic of Moldova (2015) with different rarity status.

The study was performed within the subprogram no. 010701 and within the contract no. 01-23p-096/03-05-2024 financed by National Environmental Fund.

Bat species from Holercani limestone mine, Republic of Moldova

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Key words: bats, species, diversity, abundance, roost, Holercani mine.

The research was carried out in September 2020 and in February 2021 in the limestone mine of Holercani, located on the right bank of the Dniester river. Three species of bats from two families (Rhinolophidae and Vespertilionidae) were recorded: *Rhinolophus hipposideros, Myotis daubentonii*, *Myotis bechstenii*. The most abundant species in September was *R. hipposideros* with 66.65%, followed by *M. daubentonii* and *M. bechstenii* with 16.7% each. In the hibernation period *Rh. hipposideros* had an abundance of 73.5%, *M. daubentonii* – 14.7% and *M. bechstenii* – 11.8%. The diversity of species was rather low and the individual's number varied depending on the season, for example, only six individuals were identified during the mating period, and almost 40 during the hibernation period.

The temperature and humidity in the mine, registered in the hibernation period (5.4^{o}C, 79%) are considered optimal for chiropterans and determine their larger number in winter. Therefore, the Holercani mine serves as winter roost for bats, while in other periods it is used as temporary summer roost for a low number of individuals. Various human activities (such as burning tires and dumping inside the mine) represent the main factor that negatively influences the number and diversity of chiropterans in the Holercani mine.

All three registered species of bats are rare and included in the Red Book of the Republic of Moldova. The presence of *M. bechsteinii* must be mentioned, which is a Critically Endangered species in Moldova and has the status of Vulnerable species in Europe according to IUCN. The species was registered only in several locations in the limestone mines from the central part of the country. Thus, the Holecrani mine is an important bat roost and continuous monitoring of bat species is recommended.

The study was performed within the subprogram no. 010701 and within the contract no. 01-23p-096/03-05-2024 financed by National Environmental Fund.

Comparative analysis and anthropic adaptation of bats (Mammalia, Chiroptera) in Chișinău Municipality (Republic of Moldova)

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Key words: chiroptera, urban fauna, adaptation index, Chișinău.

Most of the habitats of bats in Chișinău Municipality are either artificial, represented by limestone mines, human constructions or free spaces in buildings, or natural, such as roosts in forest areas (e.g. hollows, empty spaces under the tree bark). In the anthropized environment, some species find favorable shelter and food conditions, which are essential for their existence.

Among individuals collected from buildings and recorded in underground roosts during the years 2021-2022 the most abundant species was *Nyctalus noctula* with 48.78% abundance index, followed by *Myotis daubentonii* with an abundance of 21.39%, *Eptesicus serotinus* - 4.68%, and *Plecotus* sp. - 4.52%.

According to the anthropogenic adaptation index, all bat species in urban areas were divided into five groups, indicating different degrees of adaptation to the highly anthropized environment. In the first group, the anthropogenic adaptation index value is 8.69; this group includes two species, *Nyctalus noctula* and *Eptesicus serotinus*. The second group, with index values of 8.0, includes the species *Pipistrellus pipistrellus*, *P. pygmaeus*, *P. kuhlii*. The third group has an index of 7.69 and includes three bat species: *Myotis daubentonii*, *M. dasycneme* and *Vespertilio murinus*. The fourth group, with an index of 7.4, includes the two species: *P. auritus* and *P. austriacus*. The fifth group has the lowest index of anthropic adaptation - 7.14 and includes the species *Rhinolophus hipposideros*, *Myotis myotis*, *M. blythii*, *M. mystacinus* and *M. bechsteinii*. Individuals of this group avoid contact with people and are very sensitive to disturbance.

The species *Nyctalus noctula* and *Eptesicus serotinus* were classified as species with an anthropophilic tendency, the species of groups 2, 3 and 4 were considered as neutral species and the species of group 5 were assigned to the anthropophobic category.

The study was performed within the subprogram no. 010701 and within the contract no. 01-23p-096/03-05-2024 financed by National Environmental Fund.

Aspects of the structure and diversity of communities of mammals from the scientific reserve "Pădurea Domnească" from the Republic of Moldova

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Key words: diversity, landscape reserve, rare species, adaptation, abundance, ecotone.

Research in the "Pădurea Domnească" reserve was carried out during the years 1985-2023. A rich diversity of the mammal fauna was confirmed, consisting of about 50 species. In the reserve, the value of the edge effect index in the meadow biotope is 0.19, and in the forest - 0.41. The following share of rodents was established according to the predilection for the biotope: meadow – 30.4%, ecotone – 47.4% and forest – 22.2%. If in the spring the Simpson index in the biotopes studied was respectively a meadow – 0.082; ecotone – 0.304 and forest – 0.109, later, in the autumn period, there was a considerable increase in this index, the diversity being respectively 0.578, 0.852, and 0.322. *Apodemus sylvaticus*, *Apodemus flavicollis*, *Apodemus agrarius* and *Clethrionomys glareolus* predominate among the rodent species, the weight of which varies depending on the season, year and habitat. The most typical representatives of ungulates are *Cervus elaphus, Capreolus capreolus, Sus scrofa*. Rare animal species are also found, such as *Felis silvestris, Martes martes, Lutra lutra*. The diversity of mammals during the last 40 years decreased from 1.97 to 1.62. It was established that both the specific composition and the spatial distribution of mammals on the territory of the reserve demonstrate a wealth of ecological niche diversity. The reserve has a special social and economic value, and its protection measures need to be intensified.

Dynamic of cetacean stranding events between 2010-2023 at the Romanian Black Sea coast

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Key words: Black Sea cetaceans, stranding events, harbour porpoise, bottlenose dolphin, common dolphin, monitoring network.

This study provides a comprehensive analysis of the abundance and distribution of stranded cetaceans on the Romanian Black Sea coast between 2010 and 2023. The research involved examining and photographing each stranded species to identify possible causes of death. Detailed data on sex ratio, stranding frequency by year and month, body size of stranded individuals and their species classification were collected as part of the study. The main aim of these data collections is to identify the dynamic of stranding events in identifying the involved factors to gain an in-depth understanding of the impact of human activities on the diverse cetacean populations in the region.

The Mare Nostrum monitoring program has recorded 1330 cases of stranded cetaceans in the last thirteen years. Of these, the Black Sea harbour porpoise was by far the most frequently encountered, with 1001 individuals stranded, representing 75.26% of all documented cases. The analysis of the seasonal data indicates a significant correlation between strandings and fishing activities, in particular the turbot fishery, suggesting a considerable impact of these activities on cetaceans. In addition, the majority of by-catches are not reported, whether from legal or illegal, unreported and unregulated (IUU) fishing. These findings underline the importance of implementing stricter and more effective measures to protect cetaceans and to mitigate the adverse effects of fishing activities on these species.

The effect of age and sex on some blood parameters in sheep from North-East Algeria

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Key words: Sheep breeding, ram, ewe, blood parameters, age, sex.

Sheep farming in Algeria contributes to satisfying the population's demand for animal-based proteins. However, optimizing production in this sector requires a comprehensive understanding of the health and well-being of the sheep herd.

The objective of this study is to determine the concentration of specific hematological parameters (red blood cell count, white blood cell count, hemoglobin, and hematocrit) and biochemical markers (bilirubin, urea, and creatinine) in three age classes of ewes and rams in North-East Algeria.

This research was conducted on a healthy herd grazing on natural pastures, categorized into three age groups. The study was carried out during the spring, which is considered an optimal season for animal breeding. Blood samples were collected when temperatures ranged between 19°C and 21°C.

The results reveal physiological variations in both hematological and biochemical parameters. Analysis of hematological parameters indicates recorded physiological variations in certain parameters, primarily influenced by factors such as age and sex.

Particularly, the white blood cell count demonstrates a notably elevated level in ewes compared to standard values. However, urea levels fall within the normal range, albeit with a significant difference observed between ewes and rams of the same age. Bilirubin levels do not display any significant difference and remain within the normal range for total bilirubin in sheep.

Romanian contribution to harmonizing plant metabarcoding pipelines in Europe to support monitoring activities in the field of plants and their functional organismic networks

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Key words: DNA metabarcoding, species identification, species monitoring, organismic networks.

In Europe, initiatives for nature conservation rely on species presence, and indicator species form the foundation of decision-making in conservation. However, public and private sector stakeholders need rapid, accurate, and inexpensive methods to monitor plant biodiversity. In this context, the project "Harmonizing plant metabarcoding pipelines in Europe to support monitoring activities in the field of plants and their functional organismic networks" (METAPLANTCODE) (2024-2027) (ERANET Biodiversa+) presents a unique collaborative and transnational approach to test, optimize, harmonize and recommend best practices for plant metabarcoding for samples with varying degrees of species complexity, contamination and DNA degradation using case studies across Europe including organismic networks plants-insects. The innovative combination of accelerated molecular plant monitoring and the integration of diverse biodiversity data with optimized and automated pipelines will close knowledge gaps on the state of biodiversity, interdependencies and dynamics.

The METAPLANTCODE project aims to test and optimize pan-European case studies on metabarcoding, provide best practice recommendations, optimize analysis pipelines for species identification, and create easy-to-use reference databases. The project will identify and specify gaps, publish best practice documents on FAIR data publishing of plant metabarcode data to GBIF and the INSDC databases, and implement ELIXIR-compatible multimodal DL models in novel tools for stand-alone metabarcoding analyses using different data sources. The project will also enhance species identification accuracy through GBIF records and metadata and map regional, national, and international botanical taxonomic checklists, red lists, and floras to the Catalogue of Life (COL) through COL ChecklistBank. Furthermore, taxonomic and floristic literature will be semantically enriched with new entity recognition and relationship extraction modules to support the enhanced identification of species via domain-specific descriptive/phenotypic features. An interface will be provided to link taxonomic names to treatments, identify homonyms and synonyms, and facilitate the conversion and annotation of flora, red lists, and ecological treatments. All METAPLANTCODE products will be available at project end FAIR+.

The project will support knowledge transfer with associated partners and stakeholders from the start. Relevant stakeholders will be identified, priorities set, communication channels established, monitored, and revised as needed. Greater

stakeholder engagement, training, and outreach efforts will be undertaken to ensure that plant metabarcoding becomes a routine standard for biodiversity monitoring in Europe and beyond in the future.

Romanian Dendrocoelidae Hallez, 1892 revisited – a tribute to Radu Codreanu and Doina Codreanu Balcesco

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Key words: Fam. Dendrocoelidae, Romania, *Dendrocoelum* subgenera, species, state of knowledge.

The paper presents the current state of knowledge on Romanian Dendrocoelidae Hallez, 1892, with emphasis on the following aspects:

1) The species inventory comprises 22 species belonging to 2 genera: the genus *Dendrocoelum* Örsted, 1844 – 19 species: *D.* (*Dendrocoelum*) *lacteum* (Müller, 1774), *D.* (*Dendrocoelides*) *tismanae* Codreanu & Balcesco, 1967, *D.* (*Apodendrocoelum*) *brachyphallus* (de Beauchamp, 1929), *D.* (*Paradendrocoelum*) *alexandrinae* Codreanu & Balcesco, 1970, *D.* (*Palaeodendrocoelum*) *geticum* Codreanu & Balcesco, 1970, *D.* (*Eudendrocoelum*) *botosaneanui* del Papa, 1965, etc., and the genus *Polycladodes* Steinmann, 1910 – 3 species: *Polycladodes album* Steinmann, 1910, *Polycladodes voinovi* Codreanu, 1929, *Polycladodes affine* (Codreanu & Balcesco, 1970) (Codreanu & Balcesco, 1967b, 1968, 1970; Gourbault, 1972; Sluys et al., 2009; Stocchino et al, 2017).
2) A discussion on the morphological characters used in the literature for the separation of the genus *Dendrocoleum* in subgenera, cf. Gourbault (1972): *Dendrocoelum*, *Dendrocoelides*, *Eudendrocoelum*, *Neodendrocoelum*, *Paradencrocoelum, Apodendrocoelum*, *Bolbodendrocoelum*, *Palaeodendrocoelum*: the eyes, the adhesive organs, characters of the genitalia – the genital ducts, the copulatory apparatus (Codreanu, 1950; Codreanu & Balcesco, 1967a, b, c, 1970; Gourbault, 1972, Harrath et al., 2012; Sluys & Kawakatsu, 2006; Stocchino et al., 2013).
3) The gaps in knowledge represented by specimen types, incomplete diagnoses, etc. are also discussed.

Consequently, some future directions of study are revealed: identification of the specimen types, designation of neotypes where necessary, species morphological and molecular characterization for a better understanding of their phylogenies and natural history, creation of a national collection of Dendrocoelidae species.

This paper is a tribute to Radu Codreanu and Doina Codreanu-Balceso for their invaluable contribution to the study of the Romanian Dendrocoelidae:

- faunistic contribution by identifying and description of new species;
- systematic contribution by creating the genus *Palaeodendrocoelum* (Codreanu 1949-1950);
- phylogenetic systematic by the use of morphological characters together with other solid criteria to explain the natural history – the biogeographical (phylogeographical) criterium and the ecological criterium, a consequence of the paleogeographical conditions (Codreanu, 1950; Codreanu & Balcesco, 1967a);

- suggests and motivates the maintaining of some *Dendrocoelum* subgenera (*Eudendrocoelum*, *Neodendrocoelum*) at genus rank (Codreanu, 1950);
- introduces the term *infranucleated epithelium* (Codreanu 1943, p. 138 in Codreanu, 1950), a term widely used in nowaday literature.

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The Crustacean Collection of "Grigore Antipa" Museum - 190 years since founding

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Key words: crustacean collection, historical collections, museum, Grigore Antipa, Mihai Băcescu.

We underline the becoming moments from an almost two centuries old collection from the patrimony of the "Grigore Antipa" National Museum of Natural History from Bucharest. The Crustacean collection is part of a larger collection, the Invertebrate Collection in "Grigore Antipa" National Museum of Natural History from Bucharest, which comprises type species (more than 6300 specimens) and non-type specimens (almost 190000 specimens) from the frozen seas to the abyss of the oceans.

The history of our collection begins in the 19th century and has experienced significant growth since the appointment of Grigore Antipa in 1893, April 1st as the director of the Natural History Museum. He will enrich the collections with acquisitions and important donations from the Black Sea, Mediterranean, Adriatic Sea, completing with more material from Indo-Pacific and the Atlantic.

The start of a glorious era in the carcinological researches was during the time frame when Mihai Băcescu led the museum, for 25 years (1964-1988) and following years, together with his disciples (Z. Muradian, A. Udrescu, dr. M. Guţu, dr I. Negoescu and dr. I. Petrescu) he founded *The School of Carcinology*. Together they will describe over 700 new taxons. During this time he published three important monographies, Cumacea (1951), Mysida (1954) and Decapoda (1967). The material described in the monographies is part of this collection.

Important faunal additions came from the most important expeditions of the museum's specialists, conducted or through the collaborations Mihai Băcescu had all around the world: in the Pacific Ocean (1965), Atlantic (1971, 2007-2012) and Indian Ocean (1973-1974, 1977, 1991), Bermuda and Belize (2000, 2001).

In its 190 years of existence, the crustacean collection and the labour of its founders and most dedicated researchers transformed the museum into a pillar for the taxonomical heritage of national and international importance.

The insects (Insecta: Hemiptera, Coleoptera, Lepidoptera, Hymenoptera) from the entomological collection of the "Codrii" Reserve museum (Republic of Moldova)

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Key words: "Codrii" Reservation Museum, Entomological collection, Insecta.

The "Codrii" Reserve holds a special place among the protected areas of the Republic of Moldova, being the first reserve created with the purpose of conserving the most representative forest sectors typical to the Codri Central Plateau region.

The "Codrii" reserve museum was founded on May 18, 2004, in order to preserve, educate and inform the public in the field of biodiversity conservation. The heritage of the museum includes 34 species of mammals, 88 species of birds, 9 species of reptiles, 9 species of amphibians and 364 species of insects.

The present work represents a study of insects from the entomological collection of the "Codri" reservation museum. In the collection, the insects are stored in 14 boxes and estimate 555 specimens, which belong to 365 species from 54 families of the orders: Hemiptera, Coleoptera, Lepidoptera and Hymenoptera. Of the species identified, 11 have been found to be rare and threatened with extinction: *Carabus ullrichi*, *Carabus violaceus*, *Carabus intricatus*, *Lucanus cervus*, *Oryctes nasicornis*, *Morimus asper funereus* – Coleoptera; *Saturnia pyri*, *Euplagia quadripunctaria* – Lepidoptera; *Megascolia maculata*, *Rophites canus*, *Bombus argillaceus* – Hymenoptera, these being included in the Red Book of the Republic of Moldova (3rd edition).

Mainly, the insects were collected between 1978-1991 from the natural ecosystems of the "Codrii" Reserve by researchers Neculiseanu Z., Derjanschi V., Stratan V., Andreev A., and Manic Gh.

The materials presented in the collection have both scientific and historical value and will contribute to the understanding of the evolution of the insect fauna in the territory of the Republic of Moldova.

This study was supported by the research subproject 010701 "Evaluation of the structure and functioning of the animal world and aquatic ecosystems under the influence of biotic and abiotic factors in the context of ensuring ecological security and the well-being of the population.

Coleopteran species (Coleoptera: Megalopodidae, Orsodacnidae, Chrysomelidae) from the collection "R. Stepanov" housed in the Entomological Museum of the Institute of Zoology, MSU

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Key words: "R. Stepanov" entomological collection, Insecta, Coleoptera.

The "R. Stepanov" entomological collection consists of more than 20.000 insects from orders Orthoptera, Lepidoptera and Coleoptera being stored in the Entomological Museum of the Institute of Zoology, MSU, and in the National Museum of Ethnography and Natural History from Chişinău, Republic of Moldova.

This paper is based on analysis of coleopteran species from Megalopodidae, Orsodacnidae, Chrysomelidae families, belonging to "R. Stepanov" collection, housed in the Entomological Museum of the Institute of Zoology, MSU. The collection consists of 205 coleopteran species belonging to 68 genera, 16 tribes, 8 subfamilies: Megalopodidae with 3 species, Orsodacnidae (2 species) and Chrysomelidae (200 species). The study includes only the determined species. The specimens were sampled during an 80 year period (1900-1979). The collection includes species from the Republic of Moldova, Ukraine, Russian Federation, Belarus, Georgia, Lithuania, Hungary, Tajikistan, Kazakhstan, Kyrgyzstan, Azerbaijan and Turkmenistan. From 205 examined species only 99 are from the Republic of Moldova territory.

The "R. Stepanov" collection holds a considerable scientific value and contributes to the knowledge of the evolution of the insect diversity from the Republic of Moldova and the other 11 countries mentioned above.

This study was supported by the research subprogram 010701 Evaluation of the structure and functioning of animal world and aquatic ecosystems under the influence of biotic and abiotic factors in the context of ensuring ecological security and the well-being of the population.

Phratorina and Prasocurina species (Chrysomelidae, Chrysomelinae, Chysomelini) from the Old Palaearctic Coleoptera Collection of "Grigore Antipa" National Museum of Natural History

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Key words: Phratorina, Prasocurina, Old Palaearctic Coleoptera Collection, "Grigore Antipa" Museum.

In the "Grigore Antipa" National Museum of Natural History (Bucharest), the Chrysomelini material (Chrysomelidae: Chrysomelinae) is included in the Old Palaearctic Coleoptera Collection and in the recently formed Collection of Chrysomelidae.

The Old Palaearctic Coleoptera Collection was created around 1960, by grouping all the collections that entered in the scientific heritage of the museum at the end of the 19th and the beginning of the 20th century: Dénes Kenderessy, Arnold Lucien Montandon, Friedrich Deubel, Eduard Fleck, and (Francisc) Franz Salay Collections.

The paper presents the results of the study on the material from the Phratorina and Prasocurina subtribes preserved in this collection.

Information about the collecting date and place, the number of the specimens, the collectors' name, the present distribution range and the host plants for all mentioned species are given.

Based on the examined material (consisting of about 4.440 specimens), the Old Palaearctic Coleoptera Collection includes 17 species belonging of four genera (*Phratora*, *Neophaedon*, *Phaedon* and *Prasocuris*) from Phratorina and Prasocurina subtribes (Kippenberg, 2010).

In this collection, all species belonging to Phratorina and Prasocurina subtribes mentioned in Romania are preserved. Among the rare species in Romanian fauna, *Prasocuris junci* (Brahm, 1790) should be mentioned.

Most of the material originates from Romania, but the collection also includes specimens collected from other countries (e.g., *Phaedon tumidulus* Germar, 1824 collected from Switzerland).

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New subgenera, species and subspecies of *Carabus* in the Coleoptera collections of "Grigore Antipa" National Museum of Natural History

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Key words: *Carabus*, Europe, Asia, Africa, North America, Coleoptera collections.

In October 2016, the Museum acquired the collection of Dr. Pompiliu Lie (1926-2012), a passionate researcher in the field of natural sciences, especially dedicated to representatives of the genus *Carabus*, not only from Romania, but from all over the world. The collection was divided from the beginning into species and subspecies from Romania, respectively, systematically, into species and subspecies of *Carabus* of the world. Even if the scientific activity was carried out on *Carabus* species from Romania, the collection of foreign fauna is valuable by the number of species and subspecies it contains, by the areas where specimens were collected, by the entomologists and enthusiasts with whom it carried out the exchanges. The specimens of *Carabus* of the world came from four continents: Asia, Africa, Europe, North America and 54 countries. After the nomenclature was checked and updated of the 76 subgenera, 30 are new to the Coleoptera collections, and of the 621 species and subspecies, 418 are new to these collections. "Pompiliu Lie" *Carabus* Collection from the world (except Romania) contains 38 paratypes of 21 species and subspecies from China, Georgia, Nepal, Pakistan, Russian Federation, South Korea, Turkey. The *Carabus* of the world collection represents the work of a lifetime of Dr. Lie, being one of the biggest and the most important in Romania made by a private person.

The Catalogue of the Geometer moths (Lepidoptera, Geometridae) from the Patrimony of the National Museum of Ethnography and Natural History of Moldova, and the Technical University of Moldova

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Key words: Lepidoptera, Geometridae, entomological collections, Republic of Moldova.

Entomological collections represent the country's natural heritage and are an invaluable data source crucial in safeguarding any country's biodiversity. These collections consist of important materials due to the variety of specimens collected at a certain time. This paper reviews the collections of geometer moths from the largest state collections that are housed at two institutions: the "R. Stepanov" and "N. Zubowski" stored in the National Museum of Ethnography and Natural History Moldova, and "A. Ruscinschi" stored in the Museum of Department Horticulture and Forestry, of the Technical University of Moldova. These collections recorded more than three thousand specimens from 215 species of geometer moths, belonging to seven subfamilies and 95 genera. For each specimen from the collections is given the locality and data where it was collected, and taxonomic information. The specimens included in the present paper were collected during 1900–1940 by famous collectors and researchers such as R. Stepanov, N. Zubowsky, and A. Ruscinschi on the territory of Bessarabia.

Diurnal butterflies (Lepidoptera, Papilionoidea) from the "R. Stepanov" Entomological Collection housed at National Museum of Ethnography and Natural History of the Republic of Moldova

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Key words: Lepidoptera, Papilionoidea, "R. Stepanov" Entomological Collection, new species.

The paper presents the analysis of diurnal butterflies from Papilionoidea superfamily preserved in the entomological collection "R. Stepanov" which is in the possession of the National Museum of Ethnography and Natural History of the Republic of Moldova. This collection has an indisputable historical and scientific value, being one of the first of its kind in the Republic of Moldova. The specimens kept therein were collected between 1907 and 1978. The 327 butterflies specimens belong to a total of 68 species included in 47 genera and six families: Hesperiidae (7 species), Papilionidae (3 species), Pieridae (11 species), Riodinidae (1 species), Lycaenidae (10 species) and Nymphalidae (36 species).

190 years of ornithology at the "Grigore Antipa" National Museum of Natural History in Bucharest (Romania)

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Key words: bird collection, historical collections, museum, Wallenstein, Grigore Antipa, Dombrowski.

The museum in Bucharest was established on November 3, 1834 by the order given by the first regent Alexandru Ghika. Among the first zoological specimens are the 21 specimens of birds.

The "Grigore Antipa" National Museum of Natural History has the largest and most complete collection of birds in Romania, with specimens from both Romanian and world fauna. The bird collection of the National Museum of Natural History "Grigore Antipa" consists mainly of naturalized-mounted birds, skins, skeletons and bones, eggs, nests, stomach contents and pellets of birds, tarsometatarsus, etc.

The first custodian of the museum was the painter Carol Wallenstein de Vella (1837-1859), drawing teacher at the Saint Sava College, also a passionate ornithologist. The pieces collected and his observations were the basis of the first original work in Romanian ornithology, "*Elements of ornithology according to his own local observations even in Romania*", printed in 1853. His successor, Carlo Ferreratti, led the museum in the period 1859-1867, enriched the collections of birds with pieces collected from Wallachia or obtained in exchange with other museums from abroad. After 1870, Ioan I. Licherdopol took care of the bird collection.

The most valuable period in the development of the collection was between 1894-1916 when Robert Ritter von Dombrowski, a renowned ornithologist, worked in the museum. He compiled a collection of over 1200 specimens and published the first academic work on Romania's avifauna "*Ornis Romaniae*". After his departure from the museum, a long period of more than 30 years followed, which was a setback for the bird collection. After 1950, two meritorious ornithologists, Aurel Papadopol and Matei Vlad Tălpeanu, took care of the bird collection. They have managed to collect over 5000 skins, and have given a new life to the collection. In addition to the activity in the collection, they published more than 350 ornithological works, carried out hundreds of field days and worked tirelessly for the knowledge of the patrimony through temporary exhibitions, conferences, lessons for children in the field and in the museum.

After 1990, the collection was developed by Angela Petrescu and Gabriel Bogdan Chișamera. The patrimony of the collection was enriched by materials collected from the field and donations. During this time over 5600 specimens were introduced: naturalized mounted specimens, skins, skeletons, bones, nests, eggs,

stomach contents, frozen birds, etc. During this period, the museum's specialists published over 320 works on avifauna and ecological education.

The revision of the ornithological collection of the Zoological Museum of Babeș-Bolyai University, Cluj-Napoca, Romania

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Key words: ornithological collection, zoological museum, museum collections, Romania.

The collections from the Zoological Museum of Babeș-Bolyai University, Cluj-Napoca, Romania are among the oldest, most diverse, and historically most interesting natural history collections. The museum houses a large ornithological collection consisting of skins, full taxidermic mounts of birds, eggs, nests and birds' skeletons, which have never been revisited. Here we present the catalogue of the skins and taxidermic mounts of birds deposited or exhibited at the Zoological Museum of Babeș-Bolyai University, Cluj-Napoca, Romania. We identified 2876 specimens, belonging to 489 species from 105 families and 32 orders. The collection includes numerous local and exotic rarities. The information held in this collection can be used as a basis for many valuable ornithological studies. This collection also represents a source of information for the status of the avifauna of the Carpathian basin in the 19th and 20th centuries.

Faunistic data from the past and scientific heritage: The osteological collection held by the Zoological Museum of Babeș-Bolyai University

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Key words: bone, osteology, osteological collection, museum, biodiversity.

An important osteological collection is held by the Zoological Museum of Babeș-Bolyai University, which is unique in many ways: it covers a long time span, it contains a variety of species, belonging to different families and orders, and it is composed of the work of several naturalists and employees of the museum. To date, however, no research has been conducted in order to explore this collection. The specimens had only been partially catalogued and no updates or revision had been carried out. Hence, our aim was to systematically check the species identification of the bone specimens in the osteological collection to provide a catalogue of these specimens.

The collection includes 908 specimens, belonging to 12 bone types. The majority of bones are skulls (431), sternums (159), trophies (127), whole skeletons (95) and pelvises (59). We could identify a total of 220 vertebrate species from 101 families and 44 orders. The collection embraces the times period between 1864 and 1999, most of the specimens originating from Transylvania.

In conclusion, considering its historical background and the presence of rare species, this collection can be viewed as one of the most valuable osteological collections of Eastern-Europe, which could serve as a good basis for further studies. In addition, the maps created by us represent significant faunistic information regarding the distribution of different species in the Carpathian Basin from the 19th and 20th century.

Aspects of the Lepidoptera species in Crâng Buzău Park, Romania

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Key words: Lepidoptera, Crang Park, Romania, fauna, biodiversity.

The research focused on the study of lepidoptera from Crâng Buzău Park, during the months of May-August 2023, within the Butterfly Dream Project, part of the Științescu 2.0 Buzău Program. The objectives are: involve the community in activities to get to know the local horizon, respectively the biodiversity of the parks in the city of Buzău and encourage the community to participate in practical activities to maintain biodiversity in the local horizon.

The Crâng Forest is a part of the old forest of Vlăsiei, a secular forest with an area of 18.9 ha, located in the south-west part of the municipality of Buzău. An important scientific role is represented by the vegetation represented by a mixture of oaks with ash trees which favors the spread of butterfly species and the elaboration of a list of diurnal and nocturnal butterfly species from 14 families: Lycaenidae, Pieridae, Nymphalidae, Papilionidae, Lasiocampidae, Psychidae, Zygaenidae, Noctuidae, Sphingidae, Geometridae, Erebidae, Crambidae, Depresariidae, Nolidae. Research has also been carried out on mining lepidoptera species belonging to the Gracillariidae, Incurvariidae, Coleophoridae, Bucculatricidae, Eriocraniidae, Gellechiidae, Lyonetiidae and Nepticulidae families and the relationships between mining lepidoptera species and host plants have been studied.

Contribution to the knowledge of the Nymphalidae (Insecta, Lepidoptera) fauna from Oltenia and South of Banat Regions (Romania)

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Key words: four-footed butterflies, distribution, fauna, Oltenia.

This paper is a synthesis of the species of Nymphalidae family reported in Oltenia and South of Banat fauna during the years 2018-2023 with the occasion of field observations carried out by the author, as well as from the specimens captured during field trips and preserved in the author's collection.

In the private collection are preserved 42 out of the 50 species and forms identified by the author in the fauna of Oltenia and South of Banat Regions.

Regarding the degree of endangerment (IUCN), the identified species belong to the following taxa categories: one vulnerable taxa (VU), five near threatened taxa (NT), 42 least concern taxa (LC). Six species are protected by Romanian legislation: *Apatura metis*, *Neptis sappho*, *Euphydryas aurinia*, *Coenonympha leander*, *Kirinia roxelana* and *Arethusana arethusa*.

The following species were found with an extended area towards the center and south of Oltenia: *Libythea celtis*, *Brenthis daphne*, *Neptis sappho*, *Euphydryas aurinia*, *Melitaea britomartis*, *Melitaea phoebe*, *Nymphalis xanthomelas*, *Kirinia roxelana* and *Arethusana arethusa*.

Not all species mentioned by Rakosy L. and Goia M. in the book "The Lepidoptera of Romania: a Distributional Checklist" were found in the field and require systematic studies for their reconfirmation in the fauna of Oltenia and South of Banat Regions.

The results confirm the importance of research conducted by non-professionals for the knowledge on diversity and distribution of insect species.

Bucharest the smart city in the field of mosquito surveillance and control - a practical approach

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Key words: Bucharest, Smart City, intelligent mosquito traps, drones, *Culex pipiens*, West Nile Virus.

The Smart City concept is starting to make its appearance more and more. The application of this concept in the field of (DDD) is in itself innovative for a European capital like Bucharest. It was driven by the problems related to the monitoring and control of culicids, vector insects for the West Nile arbovirus, but also by the increase in cases of encephalitis and meningo-encephalitis in the human population in 2024, also caused by mosquito bites.

Our paper describes the experiments carried out in Bucharest in order to monitor in real time the adult mosquito populations (mostly *Culex pipiens* and *Aedes albopictus*) in different sectors of the capital by using intelligent and energy-autonomous gravid traps that allow multiple data to be collected and transmitted to a control center.

The second practical approach that we present here is the development and use in the field (in hard-to-reach areas) of culicid delarvation systems through the use of quadcopter-type drones modified for disinsection treatments in the area of the shores of shallow anthropic lakes such as Lake Cişmigiu.

The advantages and disadvantages of using these new technologies, as well as the results obtained, will be briefly presented.

Cooperation of scientists and fishermen as well as anglers during ichthyological investigations in Serbia

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Key words: fishery, monitoring, biodiversity, fish telemetry, Danube River, citizen science.

Informal cooperation between ichthyologists on one side and fishermen, as well as anglers, on the other side existed in Serbia even before the term of citizen science was first used in a journal paper published in January 1989. Involving fishermen and anglers in research unlocked their unique expertise and knowledge which helped scientists improve their research. Cooperation and co-design of scientists and citizen scientists is a good way to investigate, monitor and manage biodiversity. There are published books and papers regarding the cooperation of fishermen and scientists in Serbia at the end of the 19th and during the 20th century. This cooperation proceeded in the 21st century and is based on good local knowledge of fishermen concerning fish behavior and habitats. A new way of cooperating started with the development of fish telemetry, when tagged fish started appearing in the catch of fishermen. The latest method developed for fish monitoring is eDNA analysis which could also be a good base for cooperation, as anglers and fishermen could be trained to collect samples for eDNA analysis, such a method having already been successfully implemented in the UK (Clarke et al. 2023).

Reference:

CLARKE, S.J., LONG, E., BIGGS, J., BRUCE, K., WEATHERBY,A., HARPER, L.R., HAILS, R.S. 2023 – Co-design of a citizen science study: Unlocking the potential of eDNA for volunteer freshwater monitoring. Ecological Solutions and Evidence, 4, e12273.

New reports of Javelin Sand Boa in Southern Romania

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Key words: Javelin Sand Boa, *Eryx jaculus*, northern range limit, Danube Valley, European boid, citizen science.

Danube Valley proved to be a rich habitat for herpetofauna, including rare steppic species. Here we report results of multiple snake surveys for an elusive species, *Eryx jaculus* (Linneaus, 1758), recently assessed for *The IUCN Red List of Threatened Species* in 2016. These surveys were conducted during the springs, summers and autumns of the years 2014-2024 (May to October) in all Romanian counties neighboring the Danube River, from Mehedinți to Brăila.

Techniques such as visual observations, night transects, road cruising and satellite mapping allowed the identification of two populations of Javelin Sand Boa (*Eryx jaculus ssp. turcicus*), the only Boidae species present in Europe. The first population was accidentally discovered by some local fishermen in September 2014 near Năsturelu, in Teleorman county, with a single individual basking near a loess wall. The next day, a team of four herpers found another specimen that managed to bury in the loess, plus another female and six hatchlings, just some meters away from the point of presence of the first specimen. The next years proved that this is a good sand boa hotspot, regardless of the intense anthropical disturbances (roads, agriculture, loess digging/extraction, previous archaeological works, etc.).

During 2015-2024, teams of snake enthusiasts covered all 8 counties on the left shore of the Danube (Mehedinți, Dolj, Olt, Teleorman, Giurgiu, Călărași, Ialomița, Brăila). All fieldherping participants to this field research are members of the biggest local fauna Facebook Group: "Fauna României – Conservare prin Educație". As other populations (both historically and present) are confirmed on the right shore of the Danube (in Romanian counties of Tulcea and Constanța, and also in Bulgaria), we tried to investigate the current northern distribution range, as this is the northest European point of presence for the species. Another population was discovered în June 2015, in Teleorman county (three young individuals in a loess ridge in Fântânele). Our hypothesis is that the northern distribution range of the species is continuous, with isolated points represented by loess walls, from Mehedinți county to Brăila county, possibly along some other smaller Danube affluents, too.

We consider that this yearly field census of potential points of presence will allow a better understanding of the distribution of this species on the left shore of the lower Danube. To date, there are only two known populations and one historical point of presence (a dead specimen) outside Dobrogea region. Further field work is required in the following years in order to extend the known distribution range of this mysterious boa species, the only one present in Europe.

Urban biodiversity in Bucharest – a pathway to citizen science

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Key words: birds, citizen science, urban parks, Bucharest.

The observation of more than 120 bird species and habitat diversity brought Tineretului Park into the top 3 birdwatching places in Bucharest. The ranking belongs to the Romanian Ornithological Society and is based on the observations gathered for the Breeding Bird Atlas of Bucharest. Tineretului Park was ranked second, right after Văcărești Natural Park.

Old trees, shrubs, meadows, a natural central lake, and a little island covered in reeds make the park a hotspot for wildlife, too. Digitally documented observations of Tineretului biodiversity began 15 years ago, in 2009. From some tens of observations yearly, the quantity of registered data grew to around 2000 observations per year. The group of birdwatchers that submit observations in Ornitodata also grew. During the past 15 years, 8285 observations were registered in Ornitodata (SOR, 2024). Year by year, the observation list grew to 146 species of birds, snakes, frogs, turtles, lizards, and insects that any Bucharest resident can meet while walking in this park.

Now we know that this park is a recurrent nesting place for *Sterna hirundo*, *Accipiter brevipes*, *Asio otus*, *Otus scops, Sitta europaea*, *Parus major*, *Delichon urbicum*, *Curruca curruca*, *Phoenicurus phoenicurus*, and many other species. Seven of the ten species of woodpeckers that can be seen in Romania are present in the park.

The observations were made by members of the Bucharest Branch of the Romanian Ornithological Society. The data is used in projects like the Midwinter Count, the Breeding Bird Atlas of Bucharest, Common Bird Monitoring, and for evaluating the status of the invasive Rose-ringed Parakeet. Tineretului Park is also a good place for learning to discover and protect biodiversity, as volunteers constantly organize birdwatching tours and nature-themed events for the local community.

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Birding and learning in Titan Park from Bucharest (Romania)

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Key words: birds, citizen science, urban parks, Bucharest.

Citizen science in bird watching enables the gathering of valuable data, enhancing bird conservation and fostering a deeper connection to nature.

We are a group of enthusiastic nature lovers collecting bird data from urban parks in Bucharest, mostly from Titan Park, but also curious about other species. We encourage other people to participate in birdwatching tours, teaching them to recognize bird species and how to register their observations through mobile apps. We focus mostly on teaching children and organising field trips for school classes, preparing them to help in monitoring programs implemented on a national or international level. Our work and experience helped the Romanian Ornithological Society in projects such as the Midwinter Count, the Breeding Bird Atlas of Bucharest, the Common Bird Monitoring, and evaluating the status of the invasive Rose-ringed Parakeet.

Our study focuses on establishing the species richness and distribution of bird species in the Titan urban park. Since 2016, we have collected more than 2000 bird observations from Titan Park, with a significant increase starting in 2020. Until now, 96 bird species were observed in the park. The most common ones are *Anas platyrhynchos, Corvus corone cornix, Dendrocopos syriacus, Turdus merula, Sturnus vulgaris, Fulica atra, Parus major, Passer domesticus, Columba palumbus, Cygnus olor,* and *Passer montanus,* species that are breeding in the park. Some of the rare species seen in the park are *Bombycilla garrulus* (a rare and unique sighting from 2012), *Turdus iliacus,* and *Dryobates minor.*

Our plans are to continue educating local visitors and encouraging them to protect the local wildlife.

Romanian Cetacean Stranding Network – one of the longest citizen science efforts in the Black Sea basin

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Key words: Romania, National Cetacean Stranding Network, Citizen science, Black Sea, education, awareness.

Stranded cetaceans have long intrigued naturalists because their causes have eluded simple explanations. Regardless of the cause, strandings also represent a sample of the living community, although their fidelity has rarely been quantified. Regular monitoring of beaches would require significant budget allocation and time from scientists. That is why a collaborative effort is the best way to address this necessity by reducing expenses and fostering citizen and community involvement. Through dedicated public events and specialised training, a committed community can be developed. This is the case of Mare Nostrum's NGO Cetacean Stranding Monitoring Network. Each year, the organisation's specialists issue a call for new volunteers to join the network and fill the positions of those who have stepped down. Each year, several hundred to over a thousand students and teachers enroll. The recruited volunteers participate in a training program and receive mentorship and guidance throughout the year, following a monthly schedule to survey their assigned coastal sectors. The research involves examining and photo-documenting each stranded individual. The collected data complements the scientists' findings and provides a comprehensive analysis of the abundance and distribution of stranded cetaceans along the Romanian Black Sea coast.

Science for all: bridging gaps through citizen science initiatives

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Key words: citizen science, schools, museums, participation, research, climate changes.

This study provides an overview for the potential for schools to co-create research programs on climate change issues using the citizen sciences concept with the help of schools and natural history museums.

Citizen Science is an important tool for achieving environmental education effectiveness, encouraging critical thinking and problem solving, through cross-curricular approaches and in the sense of reducing the discrepancy between theoretical scientific knowledge and community action (Aristeidou et. al., 2022; Dalyot & Golumbic, 2023). In this context, young people can be trained to be more responsible towards the environment and who can actively contribute to the practical application of knowledge about climate change for the behavioral and mental adaptation of society to climate change (Tserej et. al., 2024).

The study analyses data from an online survey regarding Romanian teachers' views on the benefits of students learning through their involvement in research projects.

The cooperation between schools, the formal side of education and museums, which offers the non-formal learning contexts, aims to make the participation of young people more efficient in research projects. Teachers, through their training, are one of the key elements of the practical implementation of these partnerships.

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