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CUPRINS

PRELEGERI

MODELING AND DESIGN OF OLIGOMERIC AMYLOID AGGREGATES, NANOFIBRILS AND NANOPARTICLE PROTEIN CORONAS

Buchete Nicolae-Viorel[1,*]

[1]University College Dublin, National University of Ireland, Dublin, Ireland
*Corresponding author: buchete@gmail.com

Computational molecular modeling methods are growing in popularity due to their increasing applicability to study a broad range of molecular biophysics systems, spanning multiple system sizes (e.g., form atomistic to residue-based representations, and even to multiple protein-protein interactions). This talk will present several recent examples on how modern computational modeling methods, from atomistic molecular dynamics to protein docking can be used in conjunction with physics-based enhanced sampling methods to unveil structural details and molecular mechanisms of biomolecular systems of high biomedical relevance, from Alzheimer's disease to type 2 diabetes and cancer.

TAXONOMIE ȘI ECOLOGIE

SECȚIA: *TAXONOMIA ȘI ECOLOGIA INSECTELOR*

COMUNICĂRI ORALE

BIOACUSTICA ȘI PERSPECTIVELE TAXONOMICE ÎN CADRUL GENULUI *ISOPHYA* (*INSECTA*, *ORTHOPTERA*) ÎN CARPAȚI

Iorgu Ionuț Ștefan[1,*], Iorgu Elena Iulia[2]

[1]Universitatea Stefan cel Mare, Suceava, România
[2]Facultatea de Medicină și Științe Biologice, Universitatea Ștefan cel Mare, Suceava, România
*Autor corespondent: isiorgu@gmail.com

Cuprinzând aproximativ 90 de specii, *Isophya* se numără printre cele mai diverse genuri palearctice din ordinul Orthoptera. În ciuda faptului că acești cosași au morfologia aproape uniformă, structura ritmică a semnalelor acustice emise de masculi prezintă diferențe clare interspecifice. La momentul prenupțial, masculul și femela formează un duet acustic – o componentă semnificativă a sistemului de recunoaștere a partenerului conspecific. Un număr de 14 specii sunt cunoscute până în momentul de față din munții Carpați, iar cel mai interesant grup este complexul *Isophya camptoxypha*, care conține specii cu putere de dispersie geografică limitată, restricționate la câteva masive montane. Într-un cadru mai larg, ne propunem să investigăm relațiile filogenetice și filogeografice dintre speciile acestui grup, clarificând taxonomia și istoria lor evolutivă, sintetizate din studiul bioacusticii, biologiei moleculare și modelarea nișei ecologice.

DIPTERA (*INSECTA*) FROM THE CARPATHIANS, ROMANIA: BARCODING DARK TAXA IN A BIODIVERSITY HOTSPOT FROM EUROPE

Terec Andrei-Bogdan[1,2,*], Dénes Avar-Lehel[3], Keresztes Lujza[1]

[1]Centre of Systems Biology, Biodiversity and Bioresources (3B), Advanced Hydrobiology and Biomonitoring Laboratory (LabHAB), Babeş-Bolyai University, Clinicilor 5-7, 400006, Cluj-Napoca, Romania
[2]Doctoral School of Integrative Biology, Babeş-Bolyai University, Republicii 44, 400015, Cluj-Napoca, Romania
[3]Institute of Interdisciplinary Research in Bio-Nano-Sciences, Babeș-Bolyai University, Treboniu Laurian 42, 400271, Cluj-Napoca, Romania
*Corresponding author: andrei.terec@ubbcluj.ro

„Dark taxa” represent the overlooked part of biodiversity in international genetic databases, due to their problematic taxonomy, being part of little researched groups of organisms, although it most commonly includes endemics or regional taxa, with major roles in assessment of the native aquatic biodiversity. In Romania, six biodiversity hot spots have been identified in the Carpathian Mountains. They provide an evolutionary well defined geographic template for the survival and formation of new species and also harbour unknown or overlooked species. Diptera are a very

important, yet poorly explored component of aquatic ecosystems due to their difficult species level taxonomy and cryptic larvae forms.
Our initiative proposes the species-level identification of aquatic and semi-aquatic Diptera from important areas regarding the aquatic biodiversity of the Carpathian Mountains, using morphological and molecular methods.
In total, 1211 specimens were collected between 2012 and 2022, analyzed and DNA barcodes were obtained, using the standard barcode region (*mt*COI). 859 sequences belonging to 170 morphologically identified species and 26 undetermined taxonomic units, mostly represented by larvae. A total of 111 concordant BINs, 113 singleton BINs, with 68 new BINs not previously reported in the Barcode of Life Data System (BOLD) were identified.
Our results estimate a more realistic dimension of aquatic biodiversity and encourage the application of molecular methods in conservation and management of water resources in the Carpathian area.
The present work received financial support from a national grant offered by the Executive Unit for Financing Higher Education, Research, Development and Innovation, UEFSCDI, of the Romanian Ministry of Education and Research, PN-III-P2-2.1-PED-2019-0214; nr. 476PED/2020.

CONTRIBUȚII LA TAXONOMIA GENULUI *CALOSOTA* (*HYMENOPTERA, EUPELMIDAE*)

Fusu Lucian[1,*]

[1]Grupul de Cercetare în Diversitatea și Filogenia Nevertebratelor, Facultatea de Biologie, Universitatea ”Alexandru Ioan Cuza” din Iași, România
*Autor corespondent: lucian.fusu@uaic.ro

Genul *Calosota* grupează specii de himenoptere parazitoide din familia *Eupelmidae*, suprafamilia Chalcidoidea. Biologia lor este diversă, unele specii fiind parazitoizi ai larvelor de coleoptere precum cele din familiile *Anobiidae*, *Cerambycidae*, *Cleridae* sau *Curculionidae*. De asemenea, pot fi parazitoizi primari ai altor grupe taxonomice precum *Lepidoptera, Diptera, Hymenoptera* sau hiperparazitoizi. *Calosota obscura* este una dintre cele mai frecvente specii ale genului din Europa, însă datele moleculare pentru două gene, una nucleară şi alta mitocondrială, o indică ca fiind un complex de două specii criptice. Mai mult, descoperirea unei noi specii de *Calosota* din Europa aduce în discuţie limitele morfologice ale genului.

NOI DATE DE DISTRIBUȚIE A UNEI SPECII RARE DE FURNICI DIN ROMÂNIA

Georgescu Ovidiu Andrei[1,*], Pintilioaie Alexandru-Mihai[2], Tăușan Ioan[3], Fusu Lucian[1]

[1]Facultatea de Biologie, Universitatea Alexandru Ioan Cuza Iași, Iași, România
[2]Stațiunea Biologică Marină „Prof. Dr. Ioan Borcea” Agigea
[3]Department of Environmental Sciences, Lucian Blaga University of Sibiu; Applied Ecology Research Centre, Dr. Raţiu 5-7, 550012 Sibiu, Romania
*Autor corespondent: andrei.gg.2002@gmail.com

Mirmecofauna României este mai puţin studiată comparativ cu cea a ţărilor vecine, întrucât numărul de specii înregistrate pana acum este mai mic. Ținând cont de faptul că România este singura ţară din Uniunea Europeana care are pe teritoriul sau cinci bioregiuni, numărul speciilor de furnici ar trebui să fie mai mare. Este foarte probabil că multe dintre speciile criptice sau parazite au trecut neobservate, iar pentru cele deja semnalate pe teritoriul țării datele de distribuție si ecologie sunt insuficiente. Prezentarea noastră aduce date noi despre distribuția si ecologia unei specii de furnici aflata pe lista roșie a nevertebratelor din România, cunoscuta pana acum în țara noastră după un singur individ, dar și despre metode de colectare până acum ignorate în mare masură de către mirmecologi care par sa aibă succes în cazul speciilor cu comportament criptic.

REDESCRIPTION OF LARVA OF *LAMPRODILA MIRIFICA* (COLEOPTERA: BUPRESTIDAE) BASED ON SEM PHOTOGRAPHY

Ruicănescu Adrian[1,*], Manci Cosmin-Ovidiu[2], Barbu Lucian[3]

[1]Institute of Biological Research Cluj-Napoca, Romania
[2]S.E.O.P.M.M. Oceanic-Club Constanța, Romania
[3]“Babeș-Bolyai” University of Cluj-Napoca, Faculty of Biology and Geology, Romania
*Corresponding author: adrian.ruicanescu@icbcluj.ro

In this communication the larva of *Lamprodila (Lamprodila) mirifica* is described using optical macrophotography and SEM techniques. A previous description has been published, but under the name of another species of the genus, in which the structure of the gut mucosae was primarily used.

STUDIU PRIVIND PREFERINȚELE DE HABITAT ȘI DISTRIBUȚIA GÂNDACULUI SIHASTRU *OSMODERMA BARNABITA* MOTSCHULSKY 1845, ÎN ESTUL ROMÂNIEI

Hanceanu Lucian[1,*], Dascălu Maria-Magdalena[2], Fusu Lucian[3]

[1]Facultatea de Biologie, Universitatea Alexandru Ioan Cuza din Iași, Iași, România
[2]CERNESIM, Institutul de Cercetări Interdisciplinare, Universitatea ”Alexandru Ioan Cuza” din Iași, România
[3]Grupul de Cercetare în Diversitatea și Filogenia Nevertebratelor, Facultatea de Biologie, Universitatea ”Alexandru Ioan Cuza” din Iași, România
*Autor corespondent: hanceanu.lucian@yahoo.com

Osmoderma barnabita sau gândacul sihastru este o specie saproxilică, dependentă de arborii scorburoși. Datorită distrugerii habitatelor, sau eliminării arboriolor cu scorburi prin managementul silivic şi cel al spaţiilor verzi, specia este pusă în pericol. În Europa, complexul *Osmoderma eremita* este protejat prin Conventia de la Berna (Anexa II), Directiva Habitate (Anexele II si IV), în România este inclusă în Cartea Rosie a Speciilor de Nevertebrate și în Anexele III și IVa a OUG 57/2007. În România, conform Ghidului Sintetic Pentru Monitorizarea Speciilor de Nevertebrate de Interes Comunitar din România, este prezentă doar *Osmoderma barnabita*. Datele privind distribuția speciei în estul României (regiunea Moldovei) sunt aproape inexistente. O nouă semnalare realizată recent în podișul Moldovei ne demonstrează că specia are o distribuție

mai largă, dar dat fiind caracterul criptic al speciei, aceasta este foarte greu de observat. Astfel că pe durata studiului îmi propun utilizarea capcanelor feromonale pentru a identifica siturile în care specia este prezentă.

STADIUL CERCETARILOR MOLECULARE ÎN TRIBUL *DORCADIONINI* (*CERAMBYCIDAE*: *COLEOPTERA*)

Caba Florina Georgiana[1,*], Dascălu Maria-Magdalena[2], Fusu Lucian[1]

[1]Facultatea de Biologie, Universitatea Alexandru Ioan Cuza din Iași, Iași, România
[2]CERNESIM, Institutul de Cercetări Interdisciplinare, Universitatea Alexandru Ioan Cuza din Iași, Iași, România
*Autor corespondent: florinag_caba@yahoo.ro

Cercetările de taxonomie integrativă au devenit standardul internațional în ultimii 20 de ani. În aceste studii, sunt folosite date de morfologie, ecologie, biogeografie și date moleculare pentru a identifica relațiile inter- și intraspecifice. Speciile criptice, evoluția paralelă, ecotipurile, zonele hibride sunt doar câteva dintre subiectele ce pot fi elucidate și cu ajutorul analizelor moleculare. O bază de date, ce cuprinde cât mai multe secvențe de ADN compatibile, este o unealtă importantă pentru astfel de studii. Tribul Dorcadionini este un grup răspândit în zona Palearctică și este reprezentat de 6 genuri cu peste 850 de specii. După unii autori, taxonii acestui grup reprezintă circa 40% din cerambicidele cunoscute în Europa. Cu toate acestea, secvențele de ADN existente pentru diverși taxoni din cadrul tribului reprezintă doar aproximativ 0,06% din secvențele de Coleoptere acumulate până acum în BOLD (Barcode Of Life Data system), din care ~0,04% nu sunt publicate și nu pot fi utilizate de alți cercetători. Astfel, parcurgerea rezultatelor cercetărilor moleculare anterioare pe un grup taxonomic și sintetizarea acestora, reprezintă primul pas în orice studiu de taxonomie integrativă, utilizându-le ca un ghid în identificarea de abordări noi și originale.

NEW GENERA OF AFROTROPICAL *CEROCEPHALIDAE, PIRENIDAE* AND *PTEROMALIDAE* (*HYMENOPTERA*: *CHALCIDOIDEA*)

Mitroiu Mircea-Dan[1,*], Rasplus Jean-Yves[2], Van Noort Simon[3]

[1]Faculty of Biology, Alexandru Ioan Cuza University of Iași, Bd. Carol I 20A, 700505 Iași, Romania
[2]CBGP, INRAE, CIRAD, IRD, Montpellier SupAgro, Univ Montpellier, Montpellier, France
[3]Research and Exhibitions Department, South African Museum, Iziko Museums of South Africa, PO Box 61, Cape Town, 8000, South Africa
*Corresponding author: mircea.mitroiu@uaic.ro

As a preliminary step towards a generic key to several families of Afrotropical *Chalcidoidea* (*Hymenoptera*), six new genera in three families (*Cerocephalidae, Pirenidae* and *Pteromalidae*) are described. All taxa are illustrated and the relationships with similar taxa are discussed.

TAXONOMIE ȘI ECOLOGIE

SECȚIA: *ÎN CĂUTAREA IDENTITĂȚII ASCUNSE ÎN PĂMÂNT. ABORDĂRI BIOARHEOLOGICE*

COMUNICĂRI ORALE

ANALYSIS OF THE FAUNA OF THE MEDIEVAL SETTLEMENT OF THE OTTOMAN ERA (16TH – 17TH CENTURIES) FROM PAZVANT – CHEIA (CONSTANȚA COUNTY)

Bălășescu Adrian[1,*], Voinea Valentina[2], Szmoniewski Bartłomiej[3], Radu Valentin[4,5]

[1]IAB – AR, Romania
[2]MINA Constanța, Romania
[3]Polish Academy of Sciences, Cracow, Poland
[4]MNIR Romania
[5]Archaoesciences Bucarest, Romania
*Corresponding author: abalasescu2005@yahoo.fr

The archaeological research carried out in the Casimcei Valley, within the framework of the Romanian-Polish project Central Dobrudja - Landscape Changes and Human-Environment Interactions from Neolithic to Middle Ages (2014 – 2016), allowed the identification of new sites, among them the points Cheia – Pazvant II (Ottoman-era rural settlement) and Cheia Pazvant I (its necropolis).

The fauna from the Cheia - Pazvant II point (Constanța county) comes from a rural settlement, dated in the 16th - 17th centuries, and is among the few Ottoman settlements in Dobrogea studied from an archaeozoological point of view. Faunal remains have all the characteristics of household waste. Several taxa were identified: one species of fish - carp, two species of birds - chicken and goose and ten species of mammals - cattle, sheep, goat, horse, donkey, dog, cat, wolf, fox and hare. The most numerous are the fragments of mammals which represent 93.19%, followed by those of birds (6.33%) and fish (0.48%). Livestock breeding is dominant, the main species found in the sample being cattle, followed by sheep and goats. These were exploited in a mixed manner, both for their by-products and meat. Indices related to horse meat consumption are present in a reduced manner. The pig is absent in the faunal sample, which confirms the existence of religious customs imposed in food, characteristic, in the present case, of the Muslim community.

THE TRANSITION FROM THE MEDIEVAL WARMING PERIOD TO THE LITTLE ICE AGE IN NE ROMANIA (TÂRGU NEAMȚ, LA DAMIAN SITE) INFERRED BY BIOMARKERS AND CHARCOAL ANALYSIS

Butiseacă Geanina-Adriana[1,2,*], Diaconu Vasile[3], Ilie Maria[4], Vasiliev Iuliana[5]

[1]Eberhard Karls Universität Tübingen, Department of Geosciences, Institute of Archaeological Sciences, Paleoanthropology Department, Tübingen, Germany
[2]Senckenberg Biodiversity and Climate Research Centre (BiK-F), Frankfurt am Main, Germany
[3]Târgu Neamţ History and Etnography Museum, Department of Archaeology, Târgu Neamţ, Romania
[4]Horia Hulubei National Institute for Physics and Nuclear Engineering Research, RoAMS, București-Măgurele, Ilfov, Romania
[5]Senckenberg Biodiversity and Climate Research Centre (BiK-F), Frankfurt am Main, Germany
*Corresponding author: butiseacageanina.@gmail.com; geanina-adriana.butiseaca@ifu.uni-tuebingen.de

European medieval climate was marked by important continental scale changes in temperature and moisture availability, with direct impact over human communities. The drastic changes of climate conditions during the Medieval Climatic Optimum and the Little Ice Age together with the transition between the two were extensively investigated in western Europe and even depicted in historical records through literature or art, but not much information is available for Eastern Europe. Here we focus on a medieval archaeological site in NE Romania (Târgu Neamț – La Damian) from the XIVth century in order to assess the changes associated with the transition between the two major events. In this aspect, we have analyzed analyzed membrane lipids (GDGTs) and leaf waxes from the sedimentary record, coupled with charcoal and archaeobotanical remains. Our data indicate a fluctuating temperature with a regional pattern for this time interval, marked by two slightly colder episodes (as low as 7 °C) and two important warmings (up to ~11.3 °C), three degrees more than the present-day average of 8.2 °C. The warming episodes are associated with changes in moisture and vegetation, with the greatest impact over cultivated plants (i.e., cereals and beans), indicating that climatic conditions impacted the community and food availability in the region during this time period.

THE COMPARATIVE USE OF CHARCOAL FREQUENCY, AREA AND MORPHOLOGY TO RECONSTRUCT FIRE HISTORY IN A LATE HOLOCENE PEAT SEQUENCE FROM NW ROMANIA

Petraș Ancuța[1,*], Istrate Diana[1]

[1]Department of Geography, Stefan cel Mare University, Suceava, Romania
*Corresponding author: ancuta.petras@yahoo.com

Ombrotrophic peatlands are ideal archives for reconstructing charcoal fluxes resulting from vegetation burning. Because are sensitive to local environmental changes and the deposition of allochthone material is exclusively atmospheric. This article presents a charcoal analysis in which two generally accepted research methods were compared, namely (i) quantification of the frequency of occurrence (number), and (ii) quantification of the size (area) of charred particles. The peat cores were extracted from the ombrotrophic bog of Tăul Mare in the Eastern Carpathian

Mountains (northern Romania). The two methods for quantifying the occurrence of charcoal yielded similar results showing increasing variability of fire activity during the last ~ 3000 years.
Charcoal peaks are defined in the charcoal area dataset and indicate an increase in charcoal particle size during periods of high charcoal abundance, which points to local fires. Analysis of charcoal morphology showed that, during time intervals with high charcoal abundance, there was a gradual increase in the proportion of burnt wood. This suggests that episodes of high and/or low-intensity burning, on both long and short timescales, may play an important role in determining the charcoal signature of these events. The high level of detection of high-intensity fires suggests that charcoal records may be most useful in systems with high-intensity fires.
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PAST AND CURRENT SOIL/VEGETATION RELATIONSHIPS IN THE WETLANDS OF NORTH-EASTERN ALGERIA: "CASE OF WETLAND COMPLEX OF EL KALA"

Roubal Amina[1,*], Danu Mihaela[2], Benslama Mohamed[1]

[1] Badji Mokhtar - Annaba University P.O Box.12, Annaba-23000 Algeria
[2]Alexandru Ioan Cuza University of Iași, Faculty of Biology, Bd. Carol 20A, 700505, Iași, Romania
*Corresponding author: aminaaroubal@gmail.com

Global warming and its consequences raise many questions. Ecosystem changes, droughts, erosion, sudden weather events or exodus of populations are all challenges that will have to be overcome if the increase in global temperatures continues. Among the most threatened regions of the globe, the Mediterranean zone is located in particularly vulnerable bioclimatic and biogeographic contexts: it is at the confluence of the arid North African climate and the temperate humid central-African climate. In Europe, complex interactions occur between a north Atlantic influence and subtropical and tropical influences.
A great fragility of the Mediterranean region has any significant variation of the global climate results from this balance held. Moreover, the recurrent degradation and fragmentation of natural areas by anthropogenic action is very old. Thus, there remains the thorny question of a climatic and/or anthropogenic determinism of paleoenvironmental changes as evidenced by palaeoecological records on the Mediterranean rim.
The stakes are crucial for the Mediterranean Maghreb. This region is one of the global conservation priorities as a biodiversity hotspot due to a high rate of plant endemism, high taxonomic richness, and high human pressure.
The history of vegetation, climate and human occupation in the Maghreb remains largely unknown due to a very insufficient number of palynological studies.
Finally, in Algeria, only the work of Ritchie, de Salamani and Benslama addressed the question of the Holocene dynamics of vegetation. Knowledge of the history of vegetation and human action during the Holocene in Algeria is also very limited.
The present study of two palaeoecological records collected in the northeast of Algeria (El-Kala region) represents an unprecedented contribution to the North African history of vegetation. The

present work proposes to reconstruct the past ecological dynamics of the region and to evaluate the respective impacts of human activities and climate of the last 15 millennia. Beyond this major issue, the manuscript also addresses the place and biogeographic significance of key woody species such as *Cedrus* or *Myrtus*, whose maintenance is threatened by increasing anthropogenic pressure and climate change.
Main objective aims at the evolution of vegetation over time and consequently climate change in the upper quaternary period, by targeting the North-East Algerian region of El Kala, a very important Mediterranean region and very sensitive to climate change.

EVALUATION OF ANIMAL RESOURCES USED IN COMMUNITIES OF BABADAG CULTURE (HALLSTATT, IRON AGE), IN THE AREA OF NORTHERN DOBROGEA: ARCHAEOZOOLOGICAL DATA

Crețu Eliza-Ioana[1,*], Stanc Margareta-Simina[1], Bejenaru Luminița[1]

[1]Faculty of Biology, Alexandru Ioan Cuza University of Iași, Romania
*Corresponding author: cretuelizaioana99@yahoo.com

Iron Age consists of two periods: Hallstatt and La Tène. The most representative culture of the Hallstatt period is Babadag (11th/8th-7th BCE), specific to the beginning of Iron Age in southeastern Romania. This study aims to assess the animal resources used in the food economy of the communities of Babadag culture on the territory of Northern Dobrogea: Enisala-Palanca, Telița-Amza, Telița-Celic-Dere, Babadag, Niculițel-Cornet and Beidaud. Faunal remains attributed to the classes Mammalia, Reptilia, Pisces, Aves and Mollusca were identified in all of the studied samples. Analyzing comparatively the proportion of mammals, it stands out that the domestic ones significantly exceed the proportion of wild mammals, from which it follows that the basic occupation of the Babadag culture communities was represented by animal husbandry. In the sample from Telita-Amza, domestic mammals were assigned the lowest percentage, more precisely 80%, while in the sample from Beidaud, 95%. However, in order to cover their protein needs, the populations in all the settlements under this study were practicing hunting (especially of large species, such as red deer), molluscs harvesting and fishing. The last activity has an important role because in the sample from Enisala-Palanca, approximately 40% of the remains were attributed to the Pisces class, followed by the sample from Niculițel-Cornet, in a percentage of approximately 30%, but missing in Telita-Amza. Among the domestic mammals, the cattle were preferred, followed by the sheep/goat group, domestic pig, horse, and among the wild species, the most significant are red deer, wild boar and roe deer.

THE ANALYSIS OF THE FAUNAL REMAINS DISCOVERED IN THE LATE IRON AGE SETTLEMENT (4TH-3RD CENTURY BCE) FROM DOBROVĂȚ – LA LIVADĂ

Malaxa Daniel[1,*], Berzovan Alexandru[1]

[1]Institute of Archaeology, Iași, Romania
*Corresponding author: danielmalaxa@yahoo.ro

The Dobrovăț - La Livadă site is located in the northern area of the Central Moldavian Plateau, in the area of the Dobrovăț commune (Iași county). It dates back to the 5th-3rd centuries BCE, at the beginning of the second Iron Age. The site was investigated by A. Berzovan in 2020.
The archaeozoological analysis was carried out at the Institute of Archeology from Iași, the methods applied being: anatomical and taxonomic identification, quantification of faunal remains, taphonomic and paleopathological identification, age estimation, estimation of the amount of meat, evaluation of the paleoenvironment and statistical analysis. The study material is represented by faunal remains of household origin.
With a percentage of approx. 93% domestic mammals, animal husbandry was the main meat-procuring activity of this prehistoric community. Domestic cattle were the most important taxon, accounting for 30% NISP, 25% MNI and providing 90% of the total estimated meat. The horse was mainly used for riding and traction force, but taking into account the traces of butchering, it is possible that this species was consumed in some isolated cases.
Hunting was not an important occupation for this community, the wild boar and red deer being the only wild species identified.
Correlating the wild mammals preferred habitat with the high proportion of domestic ruminants and the domestic pig, we can imagine a palaeoenvironment very similar to that of present day: the settlement surrounded by some open fields so the cattle, sheep and goats can graze but the deciduous forest was not too far from the settlement suggested by the presence of wild boar and red deer and, also, by the high proportion of the domestic pig which at that time were set loose in the forest so they can feed.

ANATOMO-COMPARATIVE STUDY OF SKELETAL REMAINS DISCOVERED IN THE ARCHEOLOGICAL SITE OF ROȘIORI (NEAMȚ COUNTY)

Donciu Paul-Iulian[1,*], Bejenaru Luminița[1,2]

[1]Alexandru Ioan Cuza University of Iași, Faculty of Biology, Bd. Carol 20A, 700505, Iași, Romania
[2]Romanian Academy – Iaşi Branch, “Olga Necrasov” Centre for Anthropological Research, Iași, Romania
*Corresponding author: donciu_p@yahoo.com

Through the archaeological excavations carried out in the Roșiori site (Dulcești commune, Neamț county), located on the upper terrace of the Moldova river, four levels of habitation were identified: Geto-Dacian (5th-4th centuries BCE), Bastarnic (2nd-1st centuries BCE), of the Free Dacians (2nd-3rd centuries CE) and Romanesque (6th-7th centuries CE). A rich faunal material was collected in the nine archeological campaigns carried out in the Roșiori site, and in this paper 1339

skeletal remains from the levels of the 5th-4th BCE, 2nd-3rd CE and 6th-7th CE centuries are preliminarily analyzed.
In all levels, the remains of domestic mammals predominate, and among them the most numerous are those of domestic cattle (*Bos taurus*), sheep/goat (*Ovis aries/Capra hircus*) and pig (*Sus domesticus*). Domestic cattle record maximum frequencies in the more recent levels (2nd-3rd and 6th-7th centuries), and sheep/goat in the Geto-Dacian level. The horse (*Equus caballus*) is better represented in the 2nd-3rd and 6th-7th century levels. The remains of wild mammals are fewer, being identified as deer (*Cervus elaphus*), roe deer (*Capreolus capreolus*) and beaver (*Castor fiber*). The presence of skeletal remains of birds and molluscs has also been reported, but with reduced frequencies.

PRELIMINARY ARCHAEOZOOLOGICAL DATA CONCERNING THE PREHISTORIC SITE OF CUCUTENI A3 CULTURE FROM COSTEȘTI-CIER (IAȘI COUNTY, ROMANIA)

Crețu Eliza-Ioana[1,*], Enea Sergiu-Constantin[2], Bejenaru Luminița[1,3]

[1]Alexandru Ioan Cuza University of Iași, Faculty of Biology, Bd. Carol 20A, 700505, Iași, Romania
[2]"Ion Neculce" High School, Târgu Frumos, Romania
[3]Romanian Academy – Iaşi Branch, “Olga Necrasov” Centre for Anthropological Research, Iași, Romania
*Corresponding author: cretuelizaioana99@yahoo.com

The analyzed faunal remains come from the archaeological site of Costești-Cier (Iași County), being discovered and collected during the excavation campaigns of 2015, 2016, 2017 and 2018. The archaeozoological analysis was carried out on 2155 faunal remains belonging to the Chalcolitic period, Cucuteni culture, phase A3 (4350-4200 cal. BC). The faunal groups identified are represented by mammals (92.11% NISP= number of identified specimens), birds (0.51%), and molluscs (7.38%), the latter one being represented by: *Unio, Cepaea* and *Helix*. Among the identified mammals, the predominant species are the domestic ones (85.35%): *Ovis aries/Capra hircus, Bos taurus, Sus domesticus* and *Canis familiaris*, and the wild ones (14.65%) are represented by: *Cervus elaphus*, *Sus scrofa, Equus ferus, Lepus europaeus, Bos primigenius, Capreolus capreolus, Meles meles, Vulpes vulpes, Canis lupus*, and *Rodentia*. The archaeozoological analysis highlights the main animal resources associated with economic practices by the prehistoric community of Cucuteni culture from Costești-Cier (Iași County, Romania): mollusc harvesting, hunting and animal husbandry, the latter one being the most represented.

PALEOMEDIU ȘI PALEOECONOMIE VEGETALĂ ÎN TIMPURI MEDIEVALE LA EST DE CARPAȚI

Danu Mihaela[1,*], Diaconu Vasile[2]

[1]Universitatea Alexandru Ioan Cuza din Iași, Facultatea de Biologie, Iași, România
[2]Muzeul de Istorie și Etnografie Târgu Neamț, Târgu Neamț, România
*Autor corespondent: mihaela.danu@uaic.ro

Fitolitele reprezintă corpusculi de opal de siliciu care se formează în și între celulele plantelor și care, după descompunerea plantelor, se conservă destul de bine în contexte dintre cele mai variate, devenind martori ai compoziției vegetației din trecut. Acești indicatori biologici sunt produși într-o cantitate mare de către Poaceae, fiind astfel posibilă evidențierea unor aspecte referitoare la practicile agricole din timpuri străvechi, precum și aspecte legate de prelucrarea cerealelor, de hrana oamenilor sau a animalelor ierbivore sau de utilizarea spațiului.
Studiul fitolitelor extrase din câteva probe sedimentare prelevate din 2 situri medievale situate la est de Carpați, mai exact din județul Neamț (Târgu Neamț – La Damian și Cetatea Neamțului) contribuie la cunoașterea paleomediului, a paleoeconomiei și a unor obiceiuri alimentare ale comunităților respective.
Mulțumiri: Această lucrare a fost realizată în cadrul proiectului PN-III-P4-PCE-2021-1180, 2022-2024, *Bioarheologia tranziției de la Evul Mediu la Epoca Modernă, la est de Carpați: orașe emergente din zona de contact dintre Occident și Orient*.

PALEOMEDIUL DELTEI DUNĂRII ÎN EPOCA BRONZULUI. CERCETĂRI PALINOLOGICE

Danu Mihaela[1,*], Messager Erwan[2], Micu Cristian[3], Carozza Jean-Michel[4], Carozza Laurent[5]

[1]Facultatea de Biologie, Universitatea Alexandru Ioan Cuza din Iasi, România
[2]EDYTEM, UMR 5204 CNRS, Univ. Savoie Mont Blanc, Pôle Montagne, 73376, Le Bourget du Lac, France
[3]Institutul de Cercetări Eco-Muzeale ”Gavrilă Simion” Tulcea, România
[4]Department of Human and Social Sciences, La Rochelle University, LIENSs CNRS-UMR 7266, 17000 La Rochelle, France
[5]UMR 5602 GEODE, Université Toulouse-le-Mirail, Maison de la Recherche, Toulouse Cedex 1, France
*Autor corespondent: mihaela.danu@uaic.ro

În regiunea nord-vestică a bazinului Mării Negre, cele mai multe date palinologice provin în principal din sudul Dobrogei, din nord-estul Bulgariei: complexul lacului Durankulak, lacul Shabla-Ezeretz, lacul Varna, lacul Bolata, lacul Arkutino și lacul Oltina. Datele obținute au permis reconstituirea istoriei vegetației din aceste zone de stepă și de silvo-stepă. Studiul secvențelor marine a furnizat, de asemenea, date despre dinamica regională a vegetației pentru întreaga zonă de coastă a Dobrogei.
Deși în zona Deltei Dunării lacurile sunt abundente, datele palinologice holocene sunt extrem de rare, deoarece depozitele sedimentare (lacustre, lagunare și fluviale) nu par a fi favorabile pentru conservarea materialului sporo-polinic. După numeroase încercări de a extrage polen din mai multe carote din Delta Dunării, am reușit să identificăm o secvență sedimentară care conservat material polinic. Studiul nostru furnizează o primă descriere a peisajului din epoca bronzului așa cum rezultă din analizele palinologice, contribuind astfel cu noi date la cunoștințele despre paleoamediul Deltei Dunării.

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EXPLOATAREA RESURSELOR ANIMALE ÎN AȘEZĂRI APARȚINÂND CULTURII COZIA-SAHARNA (PRIMA EPOCĂ A FIERULUI) DIN REGIUNEA NISTRULUI MJLOCIU

Stanc Margareta Simina[1,*], Cristea Alexandra[2], Băț Mihail[3], Zanoci Aurel[3]

[1]Facultatea de Biologie, Universitatea Alexandru Ioan Cuza din Iași, Iași, România
[2]Facultatea de Biologie și Geoștiințe, Universitatea de Stat din Moldova, Chișinău, Republica Moldova
[3]Facultatea de Istorie și Filosofie, Universitatea de Stat din Moldova, Chișinău, Republica Moldova
*Autor corespondent: simina.stanc@uaic.ro

Reconstituirea și înțelegerea fenomenelor culturale din perioada timpurie a primei epoci a fierului (mijl. sec. XII – sec. IX a. Chr.) din bazinul Nistrului de Mijloc a beneficiat recent de o serie de date noi, obținute grație cercetărilor interdisciplinare. Astfel, alături de rafinarea cronologiei absolute a perioadei, au fost vizate și resturile faunistice provenite din siturile arheologice de la Saharna Mare „Dealul Mănăstirii”, Saharna „Rude” Saharna „Țiglău”, Horodiște „La Cot”. Deși studii paleoantropologice și arheozoologice au fost realizate și în perioada anterioară (primele date provenind din anul 1949), rezultatele relevate au fost publicate sumar și incomplet. Comunicarea de față va scoate în evidență rezultatele analizelor arheozoologice obținute în timpul campaniilor de săpătură din ultimii ani în siturile menționate, și localizate în raionul Rezina din Republica Moldova.

INVESTIGAȚII INTERDISCIPLINARE ÎN CERCETAREA AȘEZĂRILOR NOUA DE TIP CENUȘAR. VALENȚE PRACTICE SAU CONOTAȚII RITUALICE?

Brașoveanu Casandra[1,*], Asăndulesei Andrei[1], Danu Mihaela[2], Tencariu Felix-Adrian[1], Brunchi Radu-Alexandru[1]

[1]Centrul Arheoinvest, Departamentul Științe Exacte și Științe ale Naturii, Institutul de Cercetări Interdisciplinare, Universitatea „Alexandru Ioan Cuza” din Iași, România
[2]Facultatea de Biologie, Universitatea „Alexandru Ioan Cuza” din Iași, România
*Autor corespondent: brasoveanu.casandra@yahoo.com

În ceea ce privește complexul cultural Noua-Sabatinovka-Coslogeni, principala temă de interes și care încă provoacă numeroase dezbateri între specialiști este reprezentată natura cenușarelor, și asta din cauza faptului că bagajul informațional deținut la momentul actual este foarte redus și departe de a fi satisfăcător, pentru teritoriul României, și nu numai. Astfel, cercetarea interdisciplinară a cenușarelor specifice așezărilor culturii Noua, prin utilizarea de metode de lucru provenind din domenii științifice multiple (fizică, geografie, chimie, biologie etc.) a devenit imperios necesară, principalul obiectiv fiind cel de obținere de seturi noi de informații, esențiale în documentarea proceselor tafonomice care au dus la formarea cenușarelor. În acest sens, au fost selecționate studii de caz din arealul ocupat de bazinul hidrografic al Jijioarei (jud. Iași), pentru care, ulterior, au fost utilizate tehnici de investigare non-invazivă (fotografii aeriene, LiDAR – Light

Detection and Ranging, prospecțiuni geo-fizice). Acestea, completate de realizarea a cel puțin unui sondaj arheologic, care să ofere posibilitatea prelevării de probe de sol (în vederea efectuării analizelor pedologice, fizico-chimice și fito-polinice), pot evidenția trăsături importante ale așezărilor Noua cu cenușare, contribuind semnificativ la înțelegerea comportamentului comunităților de la sfârșitul Epocii Bronzului.

TAXONOMIE ȘI ECOLOGIE

SECȚIA: *ANTROPOLOGIE INTERDISCIPLINARĂ*

COMUNICĂRI ORALE

VARIABILITATEA DIMENSIONALĂ A COROANEI DENTARE LA DINTELE MOLAR UMAN M2: COMPARAȚIE ÎNTRE EȘANTIOANE PREISTORICE ȘI MEDIEVALE DIN NORD-ESTUL ROMÂNIEI

Ciorpac-Petraru Ozana-Maria[1,*], Groza Vasilica-Monica[1], Bejenaru Luminița[1,2], Popovici Mariana[1]

[1]Centrul de Cercetări Antropologice „Olga Necrasov”, Academia Română Filiala Iași, România
[2]Facultatea de Biologie, Universitatea Alexandru Ioan Cuza din Iași, Iași, România
*Autor corespondent: ozanapetraru@gmail.com

Antropologia dentară este o aria de cercetare cu caracter interdisciplinar, care implică multiple direcții de cercetare, precum antropologia fizică, medicina dentară, biologia, paleontologia, paleopatologia. În antropologia fizică, materialul dentar este subiectul unor studii de estimare a vârstei la deces, uzura dentară ca indicator ai dietei, modificări dentare culturale, patologii dentare și evaluarea variabilității morfometrice la nivel inter- și intrapopulațional. Deși studiile de odontometrie sunt bine cunoscute în context paleoantropologic și criminalistic, sunt puține cercetări care se referă la variabilitatea dentară și dimorfismul sexual la nivelul coronei dentare pentru eșantioane umane arheologice din Nord-Estul României. Scopul prezentului studiu este de a evalua variabilitatea dentară a populațiilor umane descoperite în contexte arheologice din Preistorie (Calcolitic și Epoca Bronzului, ~ 5000-1150 BCE) și din perioada medievală (secolele XIII-XVII) descoperite în situri din Nord-Estul României. Diametrele mezio-distale (MD) și buco-linguale (BL) ale coroane dentare a molarului M2, împreună cu indicele de coroană (IC), aria coroanei (AC) și indicele de dimorfism sexual (IDS) au fost supune analizelor statistice univariate și multivariate. Rezultatele obținute ilustrează o variabilitate dimensională mai mare a molarului M2 pentru seria feminină medievală comparativ cu eșantionul care datează din Preistorie. Pentru seria masculină, variabila MD a molarilor maxilari a arătat o variabilitate mai mare pentru eșantionul care datează din Preistorie în comparație cu cel din perioada medievală. Pentru molarii mandibulari ai seriei feminine, diferențe semnificate au fost observate atunci când aceștia au fost comparați diacronic. De asemenea, variabilele BL și AC ale molarilor maxilari au avut valori mai mari pentru probele dentare medievale.

ANALIZA ANTROPOLOGICA PE BAZA INDICATORILOR DEMOGRAFICI ȘI OCUPAȚIONALI A DOUA POPULAȚII CE APARTIN CULTURII SANTANA DE MUREȘ - CERNEAHOV (MIHĂLĂȘENI, JUD. BOTOȘANI ȘI VALEA SEACĂ, JUD. VASLUI)

Simalcsik Robert Daniel[1,2,*]

[1]Centrul de Antropologie “O. Necrasov” Academia Română Filiala Iași, România
[2]Institutul de Cercetări Bioarheologice și Etnoculturale Chișinău, Republica Moldova
*Autor corespondent: robyboy2@yahoo.com

Consensul general este că toate așezările întărite din această zonă sunt distruse la începutul secolului al II-lea d. Hr., ceea ce confirmă faptul că romanii au dorit să protejeze noua provincie Dacia și au făcut-o, prin eliminarea centrelor de putere din vecinătatea ei și prin asigurarea unei zone de siguranță pe care o puteau controla ușor, aceste efecte s-au perenizat și pe parcursul secolului IV și V d. Hr.
Pentru seriile masculine din cele două necropole, cei care prezentau un complex de modificări osoase ce pot indica activitate ecvestră, este posibil să fi fost militari, numărul acestora fiind de 33de indivizi la Mihălășeni și 17 indivizi la Valea Seacă.
Statistic, foarte interesant este că ponderea posibililor luptători în cazul necropolei de la Mihălășeni este de 8,97% pentru întreaga populație și de 25,4% din segmentul populațional de sex masculin. Pentru Valea Seacă ponderea posibililor luptători este similară. La nivelul întregii populații valoarea este de 7,94% și de 31,5%la segmentul masculin. Putem avansa ideea că mai bine de un sfert din populația masculină avea un rol preponderent militar, iar cel posibil secund era cel de activitate civilă domestică.
Nu toate contactele cu romanii au fost realizate pe cale militară, existând dovezi arheologice în așezările și necropolele carpice referitoare la existența relațiilor comerciale între locuitorii de la nord și cei de la sud de Dunăre (Ioniță 1982).
Populațiile din cele două comunități prezintă și semne de activitate non-războinică, acea parte din populație reprezentând marea majoritate. Astfel, aceste comunități este posibil să fi avut în componența lot agricultori, crescători de animale, meșteșugari și, desigur, după cum am remarcat anterior, un procent de războinici. Prin urmare, în secolele III-V d. Hr., perioadele de pace și cele de război alternează, fapt demonstrat și de datele demografice, dar și de modificările care implică stres musculo-scheletic.

PRIMUL CAZ DE AMPUTAȚIE DESCOPERIT IN CONTEXT ARHEOLOGIC IN ROMANIA

Simalcsik Angela[1,2,3,*]

[1]Centrul de Cercetări Antropologice „Olga Necrasov” Academia Română Filiala Iași, România
[2]Rezervația Cultural-Naturală „Orheiul Vechi”, Republica Moldova
[3]Institutul de Cercetări Bioarheologice și Etnoculturale, Chișinău, Republica Moldova
*Autor corespondent: angellisimal@gmail.com

Studiul prezintă primul caz de amputație descoperit în context arheologic în România, datând din perioada medievală. Scheletul, atribuit unui bărbat de circa 35-40 de ani, a fost deshumat în anul

2022 dintr-un mormânt (M1) cercetat în curtea Bisericii Romano-Catolice „Sf. Francisc din Assisi” din Târgoviște (jud. Dâmbovița, România).
În prima parte a lucrării sunt prezentate datele antropologice rezultate din analiza celor 10 schelete cercetate în campania anului 2022, iar a doua parte se canalizează pe subiectul amputării. Pe oasele antebrațului de pe partea dreaptă ale bărbatului din M1 s-a constatat absența treimilor distale, dar și o serie de modificări ample ale țesutului osos. Reacția osteoblastică a țesutului osos este vizibilă macroscopic. Suprafețele caloase sunt slab dezvoltate, rugoase, granulate, franjurate și poroase. Prezența osteofitelor este, de asemenea, evidentă. Nu există punte osoasă post-traumatică formată între oase. Prezența clară a inflamației și a excavațiilor de tip cloaca ne determină să presupunem că amputarea nu a avut loc cu foarte mult timp înainte de deces, iar în locul inciziei s-a instalat un proces inflamator-infecțios, probabil osteomielită, cu întindere destul de limitată. Acest proces nu a durat foarte mult. Probabil infecția purulentă a drenat o perioadă din „ciotul” de amputare. Singura componentă a tabloului paleopatologic al acestui individ care ar putea fi legată de amputare este porozitatea de tip trabecular din regiunea supraorbitală, temporală și zigomatică. Inflamația și instalarea infecției în zona liniei de amputare dovedesc faptul că mediul în care procedura a fost realizată nu era unul aseptic. Nu se poate determina cu certitudine factorul exact care a condus la amputare, nici cu ce fel de instrument a fost realizată procedura și nici dacă aceasta a fost o metodă punitivă sau o procedură care i-a salvat viața acestui individ. Cu siguranță însă acest eveniment i-a modificat prioritățile și i-a îngrădit mobilitatea.

STUDIUL PALEOPATOLOGIC AL UNUI SCHELET UMAN DIN SECOLUL AL XVI-LEA, DESCOPERIT LA MĂNĂSTIREA „FRUMOASA” DIN IAȘI (ROMÂNIA)

Groza Vasilica-Monica[1,*], Bejenaru Luminița[1,2], Popovici Mariana[1], Ciorpac-Petraru Ozana-Maria[1], Văleanu Mădălin-Cornel[3]

[1]Centrul de Cercetări Antropologice „Olga Necrasov”, Academia Română Filiala Iași, România
[2]Facultatea de Biologie, Universitatea „Alexandru Ioan Cuza” din Iași, România
[3]Complexul Muzeal Naţional „Moldova” Iaşi, Muzeul de Istorie
*Autor corespondent: moni_ian@yahoo.com

În acest studiu, autorii prezintă analiza paleopatologică a unui schelet din secolul al XVI-lea descoperit la Mănăstirea „Frumoasa” din Iași (județul Iași, România), în cadrul cercetărilor arheologice preventive din 2018-2019.
Scheletul codificat M38, care a aparținut unui bărbat tânăr de aproximativ 25-30 de ani, a fost descoperit într-un mormânt parțial deranjat, cu 14 monede de aur din secolul al XVI-lea; este incomplet, prezentând semne de fisuri vechi în unele oase (parietal, femur). Analizele macroscopice și stereomicroscopice au fost urmate de analiza imagistică (radiologie și tomografie computerizată).
Scheletul analizat prezintă o încărcătură patologică importantă, dominată de semnele bolii Scheuermann, identificate în principal prin deformarea vertebrelor toracice, care a determinat o curbură excesivă în regiunea dorsală, cu o deformare vizibilă a spatelui în formă de cocoașă. Această afecțiune apare de obicei în perioada de creștere și dezvoltare, înainte de pubertate, fiind mai frecventă la bărbați. Deși, boala Scheuermann este o formă clinică comună în prezent, puține

cazuri au fost raportate la schelete umane arheologice. Prin urmare, cazul descris în această lucrare contribuie la cunoașterea paleopatologică a populațiilor medievale.
Pe același schelet au fost identificate și alte patologii: spina bifida occulta la nivelul osului sacrum, cariile dentare multiple, tartrul dentar și hipoplazia smalțului dentar. Hipoplazia smalțului identificată este de tip liniar transversal, pe dinții incisivi, canini și premolari. Hipoplazia smalțului este o anomalie de dezvoltare cauzată de perturbări ale amelogenezei, reprezentând un indicator nespecific al stării de sănătate sau/și al stării nutriționale în populațiile umane; este un răspuns al organismului uman la stresul fiziologic. Defectele de smalț au fost utilizate pe scară largă de antropologi pentru investigarea perturbărilor de creștere în populațiile trecute, deoarece sunt indicatori ai tulburărilor în timpul perioadei de dezvoltare a copilului.

MULTIDISCIPLINARY APPROACH OF A HUMAN SKELELETON EXHUMED FROM THE NECROPOLIS OF 16TH-17TH CENTURIES AT “VOVIDENIA” CHURCH, IN IAȘI, ROMANIA

Groza Vasilica-Monica[1,2,*], Bejenaru Luminița[1,2], Pîrnău Ludmila[2,3], Popovici Mariana[1,2], Ciorpac-Petraru Ozana-Maria[1,2]

[1]Romanian Academy – Iasi Branch, “Olga Necrasov” Center of Anthropological Research, Romania
[2]“Alexandru Ioan Cuza” University of Iasi, Faculty of Biology, Romania
[3]Romanian Academy – Iasi Branch, Institute of Archaeology, Romania
*Corresponding author: moni_ian@yahoo.com

This study is focused on a burial discovered in 2021 (in Unit 4/Feature 13) from the necropolis of 16th-17th centuries, at the “Vovidenia” Church in Iasi (Romania). According to the funerary stone, the human remains belonged to a historical female personality from the medieval Iasi, the former capital of Moldavia. The skeleton was subjected to multiple investigations based on classical paleoanthropological and palaeopathological methods, stereomicroscopy, dental wear, dental non-metric traits, all integrated in the archaeological context.
The age at death and sex estimations, as well as taphonomy evaluation were performed according to the classical methodology. All teeth surfaces were examined and digitized using a Zeiss Stemi 305 stereomicroscope with a Canon Power Shot G9 attached. The degree of dental wear was assessed by the semiquantitative scoring system. The evaluation of dental traits and scores were based on the Arizona State University Dental Anthropology System (ASUDAS).
The human skeleton belonged to a female with the age at death of 35-40 years old. The preservation status of the skeleton is satisfactory. At the level of the cranium and of the lower epiphyses of the humeri there are traces of oxidation. Linear enamel hypoplasia (LEH) is present on the upper left lateral incisor (I2), upper left canine, upper left first premolar (P1), and lower right canine. Dental caries (2nd degree) affected the lower left first molar (M1). The dental wear scoring method showed a reduced occlusal/incisal dental wear. The non-metric traits identified on the upper teeth are shovelling on central incisive, tuberculum dental on upper lateral incisors, and Bushman tubercule on the canine. Other traits that make this skeleton distinctive are those represented by the supernumerary cusps.
This work was supported by a grant of the Ministry of Research, Innovation and Digitization, CNCS - UEFISCDI, project number PN-III-P4-PCE-2021-1180, within PNCDI III.

PARTICULARITATI ALE DENTITIEI UNUI SCHELET UMAN: STUDIU DE CAZ, SCHELET CX2/13 DE SECOL XVII, DESCOPERIT LA CASA ROSENSTEIN DIN ORASUL IAȘI (ROMANIA)

Popovici Mariana[1,2,*], Ciorpac-Petraru Ozana-Maria[1,2], Groza Vasilica-Monica[1,2], Hriban Cătălin[3], Bejenaru Luminița[1,2]

[1]Centrul de Cercetări Antropologice „Olga Necrasov”, Academia Română Filiala Iași, România
[2]Facultatea de Biologie, Universitatea „Alexandru Ioan Cuza” din Iași, România
[3]Institutul de Arheologie, Academia Română Filiala Iași, România
*Autor corespondent: sorexmin@yahoo.com

Cercetările arheologice preventive, necesare pentru realizarea lucrărilor de modernizare a străzilor din municipiul Iaşi (România), în zona cuprinsă între „Sf. Strada Andrei, „A. Bulevardul Panu”, strada „Palat”, strada „Sf. Trei Ierarhi” și „Trantomir”, au condus la descoperirea unui mormânt izolat, cu un schelet codificat Cx2/13. Complexul funerar (Cx2) a fost descoperit în Unitatea 13, situată la nord-est de fundațiile Casei Rosenstein, și a fost datat cu ajutorul a două monede din prima jumătate a secolului al XVII-lea, găsite la nivelul defunctului.
In studiul de față, vom face referire la dentiția acestui shelet uman: evaluarea morfometrică (prin morfometrie geometrică) şi a caracterelor non-metrice dentare. Gradul ridicat de uzură dentară nu a permis vizualizarea și evaluarea tuturor trăsăturilor non-metrice dentare, însă se remarcă totuşi o morfologie simplă a cuspizilor şi a structurilor accesorii pentru dinții anteriori (incisivi, canini).
Câteva particularități au fost evidențiate la nivelul dentiției posterioare (premolari şi molari). Asimetria bilaterală a dispunerii dinților maxilari, induce ipoteza unui posibil caz de ageneză a molarului 1 superior dreapta, detaliat şi descris in acest studiu prin tehnici de morfometrie geometrică.

PALEOHISTOLOGICAL STUDY OF INFLAMATORY REACTIONS IN A HUMAN SKELETON WITH A POSSIBLE METASTATIC CARCINOMA DISCOVERED IN IASI CITY (17TH-19TH CENTURIES)

Ciorpac-Petraru Ozana-Maria[1,2,*], Neagu Anca-Narcisa[1], Groza Vasilica-Monica[1,2], Popovici Mariana [1,2], Bilavschi George[1,3], Pîrnău Ludmila[1,3], Bejenaru Luminița[1,2]

[1]Faculty of Biology, Alexandru Ioan Cuza University of Iași, Iași, Romania
[2]Romanian Academy – Iași Branch “Olga Necrasov” Center of Anthropological Research, Iași, Romania
[3]Romanian Academy – Iași Branch, Institute of Archaeology, Iași, Romania
*Corresponding author: Ozana-Maria Ciorpac-Petraru, ozanapetraru@gamil.com

The histological study on archaeological human remains represents a valuable research area in paleoanthropology. The examination of archaeological human bone tissue can provide valuable information of cellular activity associated with past diseases or can contribute to strengthens in the differential diagnosis. This study refers to a paleohistological approach of several pathological lesions of a possible metastatic carcinoma identified in a human skeleton (M190) discovered in an archaeological site of 17th -19th centuries from Iasi City. The paleoanthropological analysis reveals that the M190 skeleton belonged to an adult male of 30-35 years old. A previous paleopathological analysis carried out through imagistic methods (i.e., X-rays, CT scans)

highlighted several perforations/lesions on both skull and postcranian skeleton. Also, on the long bones new bone formation areas were observed, which are subjected to the analysis in this study. Small bone samples were collected and embedded in epoxy resin EpoThin 2® (Buehler), ground and polished manually, using wet/dry carbide papers of decreasing grit sizes. The bone sections were examined under a transmitted light microscope. The histotaphonomy assessment was based on the semi-quantitative system Oxford Histological Index (OHI) system. The osteological material collected from the M190 skeleton showed an extensive taphonomic degradation with several areas of infiltrations, taphonomic inclusions and mainly bacterial degradation morphological types. The postmortem changes observed at microscopic level had considerably limited the analysis and description of the tissue. In all analysis samples, new bone tissue formed by apposition was identified, on the external surface of the bone. The new bone tissue formed as the result of an inflammatory process of the periosteum showed two morphological patterns (i.e., homogeneous and villous) with different development in various anatomical segments.
This work was supported by a grant of the Ministry of Research, Innovation and Digitization, CNCS - UEFISCDI, project number PN-III-P4-PCE-2021-1180, within PNCDI III.

SEXUAL DIMORPHISM IN MEDIEVAL HUMAN DENTAL SAMPLES FROM IASI CITY (ROMANIA): MORPHOMETRIC AND NON-METRIC EVIDENCE

Popovici Mariana[1,2,*], Groza Vasilica-Monica[1,2], Ciorpac-Petraru Ozana-Maria[1,2], Bejenaru Luminiţa[1,2]

[1]Romanian Academy – Iaşi Branch, “Olga Necrasov” Center of Anthropological Research, Iaşi 700481, Romania
[2]Alexandru Ioan Cuza” University of Iaşi, Faculty of Biology, Iaşi 700505, Romania
*Corresponding author: sorexmin@yahoo.com

This study starts from the hypothesis that sexual dimorphism is found not only at the dimensional level but also in the covariation of the tooth structural components. Also, the degree of sexual dimorphism expression is definitely a peculiarity of every human population spatially and chronologically defined. This study aims to present and identify the changes in the tooth shape and non-metric traits using standardized reference points to establish parameters of sexual dimorphism in several medieval human dental samples from the city of Iasi (16th-19th centuries).
The bidimensional data for geometric morphometrics were collected using a set of landmarks located on the occlusal surface of the lower second molar and its periphery. Also, non-metric traits for the same molar teeth (i.e., cusp numbers, and groove patterns) were scored according to the ASUDAS system.
The results of the study highlight dental sexual dimorphism patterns marked by the plasticity of the two buccal cusps (i.e., protoconid, and hypoconid), and the intercuspid grooves. The covariation of the shape variables with the nonmetric traits between the two sexes shows significant differences between the studied human dental samples (Procrustes ANOVA: $F = 3.13$; $p = 0.006$), and the trend and the way of covariation these variables highlight specific characteristics in each analyzed human group; features of these interpopulation covariations are also presented in the paper.
This work was supported by a grant of the Ministry of Research, Innovation and Digitization, CNCS - UEFISCDI, project number PN-III-P4-PCE-2021-1180, within PNCDI III.

DIVERSITY OF ANIMAL RESOURCES IN THE ECONOMY OF MEDIEVAL MOLDOVA: NEW ARCHAEOZOOLOGICAL DATA

Bejenaru Luminița[1,2,*], Popovici Mariana[1,2], Stanc Margareta Simina[1]

[1]Faculty of Biology, Alexandru Ioan Cuza University of Iasi, Iasi, Romania
[2]Olga Necrasov Centre of Anthropological Research, Romanian Academy - Iași Branch, Romania
*Corresponding author: lumib@uaic.ro

Faunal remains discovered in archaeological sites can substantially contribute to the reconstruction of lifestyles and subsistence practices for past communities. Archaeozoological studies have already provided valuable information on various aspects of human-animal interactions, subsistence strategies, economic activities, and cultural practices, contributing to understanding of European medieval societies and their relationship with the animal world. In the case of Medieval Moldova, the archaeozoological research is essential, since written documents are generally lacunary and ambiguous.
This study is focus on the diversity of animal resources used in the economy of Medieval Moldova as they are reflected by archaeozoological analyses made for the sites of Eastern Romania and Republic of Moldova. The archaeozoological data are statistically analysed and compared in terms of frequencies, and the Correspondence Analysis of the identified animal species and medieval settlements reveals associations between these two variables.
This work was supported by a grant of the Ministry of Research, Innovation and Digitization, CNCS – UEFISCDI: project number PN-III-P4-PCE-2021-1180 within PNCDI III.

TRADITIONAL ROMANIAN VALUES IN THE CONTEXT OF GLOBALIZATION. CASE STUDY

Fedor Catalin-George[1,*]

[1]Academia Romana, Filiala Iasi, Centrul de Cercetari Antropologice, România
*Correponding author: cgfedor@yahoo.com

The work we are presenting is part of a series dedicated to the Roman Catholic confessional communities in Moldova and shows the results of a social anthropology research carried out in Gherăeşti, Neamţ county. It proposes an evaluation of the local specificity. In this sense, the aim is to reveal the following aspects: the image of the locality and the community in the local collective mind; traditions and holidays; perception regarding the future of the community.
The theoretical premise from which we start consists in the fact that, in general, by community we understand the members of a group that asserts a distinct identity given by the consciousness of a common history or origin.
The research is qualitative.
The results show us that the members of the Gherăeşti community want to preserve the traditional values given by the family, the religious faith and the history of the community, these being constitutive elements of their identity and specificity.
The conclusions emphasize the idea that identity and collective memory must be passed on.

SUICIDAL PHENOMENON IN THE CASE OF THE INSTITUTE OF FORENSIC MEDICINE IN CLUJ-NAPOCA IN THE PERIOD 2017-2021

Donciu Paul-Iulian[1,*], Siserman Costel Vasile[2,3]

[1]Facultatea de Biologie, Universitatea „Alexandru Ioan Cuza” din Iași, Romania
[2]Facultatea de Medicină, Universitatea de Medicină și Farmacie „Iuliu Haţieganu” din Cluj-Napoca, Romania
[3]Institutul de Medicină Legală din Cluj-Napoca, Romania
*Corresponding author: donciu_p@yahoo.com

Through the study conducted at the Institute of Forensic Medicine in Cluj-Napoca, a number of 331 suicide cases were registered for a period of five years. The persons included in the study came from all social backgrounds, having variable ages between 17 years and 91 years. The large number of suicides between 2017-2021 allowed a detailed study of the methods used, the identification of sex and the main age groups of the persons who resorted to the suicidal act.
Out of the total of 331 cases studied, 271 males and 60 cases of females were identified. In 2017 there were 96 suicide cases, in 2018 there were 84, in 2019 there were 60 cases, in 2020 69 cases were recorded and in 2021 (not complete) 23 cases. The most used method in suicidal cases was hanging (194 cases), followed by drowning (45 cases), precipitation (42 cases), intoxications (29 cases), electrocution (10 cases), self-inflicted wounds (9 cases) and shooting (2 cases). Most suicidal cases have been reported in adults over 40 years of age.

TAXONOMIE ȘI ECOLOGIE

SECȚIA: *GENERAL 1*

COMUNICĂRI ORALE

PRELIMINARY DATA REGARDING CENOSES WITH *CRASSULACEAE* SPECIES IN THE PIETRELE ROȘII BOTANICAL RESERVE

Zamfirescu Oana[1,*], Borcă Mădălina[1]

[1]Faculty of Biology, Alexandru Ioan Cuza University of Iași, Romania
*Corresponding author: o_zamfirescu@yahoo.com

The *Crassulaceae* is a systematically complex botanical family with an impressive morphological diversity, encompassing 35 genera and 1500 species, making it the largest botanical family belonging to the order Saxifragales. The vast majority of species in the Crassulaceae family are succulent plants. Regarding plant ecology, the species inhabit semi-arid areas with adaptations to xeric environmental conditions and have an almost cosmopolitan distribution, with centres of diversity in Mexico, South America and the Himalayas.
The Crassulaceae family is well represented in Romania in terms of the diversity of succulent plant species, including the genera *Sedum, Sempervivum, Jovibarba* and *Rhodiola*. They are annual or

perennial plants, mostly found in mountainous areas, on cliffs, sands, and old walls. The phenotypic variety and the richness of the species means that the systematics of the botanical family is in a constant state of flux, as both the genetic boundaries and the relationships between genera are ambiguously understood and require further study (both phytocenological and genetic).

Our study contributes to the understanding of the cenotic context of Crassulaceae species within the Botanical and Geological Reserve Pietrele Roșii located in Tulgheș village, Harghita county, emphasizing the need to identify the ecological preferences of the target species in order to understand their biological complexity. The protected area is located at an altitude of 1215m, on the mountain Piatra Comarnicului, north-east of Tulgheș, which represents the south-western extremity of the Bistrița Mountains. Within the Reserve with forest vegetation and glades there is a cliff composed of hippuritic limestones, and the important floristic elements (*Astragalus roemeri, Hieracium pillosum, Silene acaulis, Delphinium simonkaianum* etc.) make the area phytogeographically important, including the following phytogeographic stages: the mountain stage of pure spruce forests, the mountain stage of mixed forests and the hilly stage of oak forests and hillside mixed forests.

Sedum hispanicum, Sedum acre, Jovibarba globifera, Hylotelephium maximum have been identified on the territory of the Botanical Reserve, the best represented being the genus Sedum, which occupies extensive areas, having a pioneering role on the cliffs observed in our study.

PRELIMINARY DATA ON *AMBROSSIA ARTEMISIIFOLIA* POPULATIONS IN ROMANIA

Zamfirescu Oana[1,*], Iorga Ionuț-Alexandru[1], Gostin Irina Neta[1]

[1]Faculty of Biology, Alexandru Ioan Cuza University of Iași, Romania
*Corresponding author: o_zamfirescu@yahoo.com

Ambrosia artemisiifolia L. (Fam. *Asteraceae*) is an annual herbaceous species native to North America. It was first introduced 1863 in Western Europe as an exotic plant, adapting to the conditions very well and in the year 1910 it appeared in Romania.

Due to the small dimensions and form of the fruit the distribution of the species was facilitated with the help of wind, train, and car traffic and also by humans. The present state of this species is invasive because it produces a larger quantity of seeds than native species.

Besides the large seed production, it produces a large quantity pollen grains which are a danger to human health because it irritates the skin and the mucus lining of the nose. This species represents danger her so many combat operations were conducted on eradicating it applying her besides plucking the plants and cutting it, but they didn't succeed in accomplishing this purpose.

The aim of this report is to contribute to the chorology of this species by analysing the distribution and also morpho-anatomical aspects from specimens collected from Iași (Bîrnova, Ciurea and The Botanical Garden), Botoșani (Vlădeni) and Buzau (Cotu-Ciorii).

THE MELANISTIC COLOR MORPH IN TERRESTRIAL POLYMORPHIC SNAKES: A SYSTEMATIC REVIEW AND GLOBAL META-ANALYSIS

Sahlean Tiberiu Constantin[1,2], Gherghel Iulian[2], Spaseni Petronel[2], Strugariu Alexandru[2,*]

[1]Institute of Biology - Bucharest, Romanian Academy, Bucharest, Romania
[2]Department of Exact and Natural Sciences, Alexandru Ioan Cuza University of Iași, Romania
*Corresponding author: alex.strugariu@gmail.com

Animal coloration is generally adapted to abiotic and biotic factors and is involved in fundamental aspects of animals' lives such as predator-prey interactions, therefore being subjected to intense selective pressures. The dorsal coloration of reptiles protects the animals from predation, either through background matching or aposematism, influences its ability to thermoregulate, absorbs damaging radiation from reaching important structures and plays an important role in intra- and interspecific signaling, including reproduction. The thermal melanism hypothesis predicts that individuals with lower skin reflectance (such as melanistics) will heat up faster and reach higher body temperatures compared to normal colored conspecifics, leading to a plethora of adaptive advantages such as access to a wider range of habitats, longer activity periods, higher growth rates, better body condition and increased reproductive output. There have been a few qualitative reviews on the evolutionary significance of melanism in reptiles, but so far, no quantitative analysis exists. Such a synthesis is essential to advancing our understanding of the importance of melanism in snake populations. Consequently, our systematic review and meta-analysis aims to (1) summarize the current research regarding the role of melanism in polymorphic terrestrial snake species, (2) address some of the important questions that still exist regarding the phenomenon, such as: (2.1) how prevalent is melanism in terrestrial snakes which have a melanistic morph, (2.2) what environmental correlates can explain the observed proportion of melanistic individuals, (2.3) is the proportion of melanistic individuals different between the two sexes, (2.4) does the melanistic morph possess an adaptive advantage compared to normal-colored individuals in terms of body size (i.e. are melanistics larger than their normal counterparts), and (3) identify remaining gasp in our knowledge where further studies are still needed.

EXPLORING NOCTURNAL BEHAVIOR IN THE COMMON GRASS SNAKE (*NATRIX NATRIX*) WITH THE HELP OF CITIZEN SCIENCE

Spaseni Petronel[1,2,*], Sahlean Tiberiu[2,3], Gherghel Iulian[2,4] , Zamfirescu Ștefan-Remus[1], Petreanu Ionuț-Cătălin[1], Melenciuc Raluca[4], Alistar (Pelcaru) Cristina Florentina[5], Gavril Viorel Dumitru[5,6], Strugariu Alexandru[2]

[1]Faculty of Biology, Alexandru Ioan Cuza University of Iași, Romania
[2]Department of Exact and Natural Sciences, Institute of Interdisciplinary Research, Alexandru Ioan Cuza University of Iași, Romania
[3]Bucharest Institute of Biology, Romanian Academy, Bucharest, Romania
[4]Faculty of Natural and Agricultural Sciences, Ovidius University of Constanța, Romania
[5]Department of Biochemistry and Molecular Biology, Faculty of Biology, University of Bucharest, Bucharest, Romania
[6]Institute of Biology Bucharest, Romanian Academy, Bucharest, Romania, University of Bucharest, Bucharest, Romania
*Corresponding author: awpe94@gmail.com

Nocturnal activity plays a crucial role in the biology of various animal species. While many amphibians are nocturnal due to their tolerance of lower temperatures and reliance on humidity and precipitation, reptiles, including snakes, often exhibit a mix of diurnal and nocturnal activity patterns influenced by temperature fluctuations. In Europe, most snake species are diurnal, while some are nocturnal and a few show a mix of these activity patterns. The common grass snake (*Natrix natrix*) is a primary diurnal species that has a wide distribution, ranging from the Rhine region in Germany eastward to Lake Baikal, including also Fennoscandia (northern Europe), the Balkan Peninsula and some parts of the Middle East. Our study explores the nocturnal behavior of the common grass snake (*Natrix natrix*) across its distribution range, using data gathered from citizen science platforms like iNaturalist. We collected a total of 127 nocturnal observations, with 33 being crepuscular (25.98%) and 94 nocturnal (74.02%) records. Observations of nocturnal activity spanned from March to November, peaking between May and August. Striped individuals were found to be active at higher temperatures than unstriped ones, which is attributed to regional variations in body patterns. Moon presence had no significant impact on nocturnal behavior. Overall, this study contributes valuable insights into the nocturnal behavior of a primarily diurnal species, highlighting the need for further research to comprehensively understand the factors driving this behavior and its ecological implications.

ANTROPIZAREA ȘI EFECTELE ACESTEIA ASUPRA DISTRIBUȚIEI AVIFAUNEI DIN PĂDUREA-PARC CIRIC

Nechifor Maria-Alexandra[1,*]

[1]Școala gimnazială Ionel Teodoreanu" din Iași, Iași, România
*Autor corespondent: marianechifor240@gmail.com

Apariția noilor locuințe între cele deja existente sau la marginea orașului Iași datorată creșterii populației determină micșorarea spațiilor verzi existente și implicit supraaglomerarea celor rămase. Fenomenul, numit antropizare, are efecte negative deopotrivă asupra faunei și florei din interiorul și împrejurimile localității. Pornind de la această problemă, am analizat efectele antropizării asupra avifaunei din pădurea-parc Ciric, zonă de agrement situată la periferia municipiului. Cu acest scop, am adunat date despre speciile de păsări întâlnite și activitățile umane din zonă de pe parcursul unui an calendaristic (aprilie 2022 - martie 2023). Activitatea de teren a acoperit cele trei decade ale lunii, pentru a reda cât mai fidel situația din zona de studiu care a fost, la rândul ei, împărțită în patru sectoare (Veneția, Ciric I, Ciric II, Pădure). Metodele de studiu au fost: transectul, observația din punct fix și identificarea sonoră a speciilor de păsări. În această perioadă, am identificat 79 de specii de păsări, care se încadrează taxonomic în 36 de familii și 15 ordine. Peste jumătate dintre acestea sunt păsări de talie mică (passeriforme). Diversitatea specifică denotă că în perimetrul lacurilor pot fi observate cele mai multe specii, iar în cel al transectului de pădure au fost observate cele mai puține. Distribuția factorului antropogen, reliefează faptul că zona de pădure este perimetrul în care au fost înregistrate cele mai multe perturbări ale habitatului, iar dintre lacuri, Ciric I este cel mai afectat, urmat de Ciric II și, în cele din urmă, Veneția. Aceste date sunt corelate între ele, din punct de vedere al locației analizate, legătura fiind întărită de valorile indicilor de diversitate Shannon și Simpson calculați, pentru fiecare în parte, conform perioadei ciclului biologic al păsărilor.

PERSPECTIVE ANTREPRENORIALE ÎN DOMENIUL SERVICIILOR DE CONSULTANȚĂ DE MEDIU

Danu Mihaela[1,2*]

[1]Facultatea de Biologie, Universitatea Alexandru Ioan Cuza din Iași, Iași, România
[2]Facultatea de Drept, Universitatea Alexandru Ioan Cuza din Iași, Iași, România
*Autor corespondent: mihaela.danu@uaic.ro

Activitățile economice, precum producția industrială, agricultura, construcțiile, transportul, pot avea un impact semnificativ asupra mediului înconjurător. Aceste activități pot genera emisii de gaze cu efect de seră, precum și deșeuri periculoase, pot duce la poluarea aerului și apei, la defrișări și la distrugerea habitatelor naturale. Prin urmare, este esențial ca aceste activități să fie gestionate într-un mod responsabil și sustenabil. Aici intervine rolul serviciilor de consultanță de mediu.
Prezentul studiu își propune să evidențieze aspecte ce se referă la oportunitățile pe care le au antreprenorii în servicii de consultanță de mediu. De asemenea, în lucrare sunt analizate aspecte referitoare la serviciile consultantilor de mediu (inclusiv aspecte juridice), precum și la modul în care antreprenorii din acest domeniu pot contribui la protejarea mediului și la promovarea practicilor sustenabile, având astfel un impact pozitiv asupra societății și asupra mediului înconjurător.
Mulțumiri: Lucrare realizată în cadrul proiectului "ACADEMIC-IUS-ANTREPRENOR: Consolidarea unui sistem integrat juridic și economic în domeniul antreprenoriatului pentru studenții și absolvenții UAIC, CNFIS-FDI-2023-F-0529".

POLUAREA FONICĂ ȘI EFECTELE EI ASUPRA BUNĂSTĂRII MAMIFERELOR MARINE AFLATE ÎN CAPTIVITATE – STUDIU DE CAZ LEII DE MARE, SPECIA *OTARIA BYRONIA*

Curlișcă Angelica[1,*]

[1]Complexul Muzeal de Științe ale Naturii Constanța, România
*Autor corespondent: curlisca.angelica@gmail.com

Cercetările care evaluează bunăstarea mamiferelor marine și oportunitățile de progres în domeniul îngrijirii acestor specii găzduite în oceanarii și vivarii au crescut rapid în ultimul deceniu. În timp ce asigurarea de amplasamente confortabile, oportunitățile sociale adecvate, enrichmentul , îngrijirea medicală, au continuat să primească atenție de la manageri și oamenii de știință, în ceea ce privește poluarea fonică și efectele ei asupra bunăstării animalelor în captivitate, aceasta este mai puțin studiată.
Prezenta lucrare se bazează pe măsurători efectuate în luna octombrie 2013, în zona exterioară bazinului D2 (bazin lateral acoperit), zonă în care se efectuau lucrări pentru două noi bazine. Activităţile din zona de efectuare a măsurătorilor erau generatoare de zgomote cu un nivel acustic ridicat, produs în principal de maşini de găurit, ciocane roto-percutoare etc.
Datele obținute au fost comparate cu datele existente în literatura de specialitate pentru pragul auditiv (pragul de audibilitate) al pinnipedelor.

TAXONOMIE ȘI ECOLOGIE

SECȚIA: *TAXONOMIA ȘI ECOLOGIA INSECTELOR*

POSTERE

ORGANISMELE ENDOSIMBIONTE ALE SPECIILOR DIN COMPLEXUL *EUPELMUS VESICULARIS* (HYMENOPTERA) IDENTIFICATE PRIN METODE DE GENETICĂ MOLECULARĂ

Atodiresei Mălina[1,*], Fusu Lucian[1]

[1]Facultatea de Biologie, Universitatea "Alexandru Ioan Cuza" din Iași, Iași, România
*Autor corespondent: malina_atodiresei@yahoo.com

Aproape identice din punct de vedere morfologic, dar diferite foarte mult din punct de vedere genetic, unele specii din complexul *Eupelmus vesicularis* (*Hymenoptera*) prezintă fenomenul de partenogeneză telitocă, cel care determină prezența exclusivă a indivizilor femeli, cei masculi nefiind identificați.

Partenogeneza este rezultatul infectării gazdei cu organisme endosimbionte, oferind atât beneficii, precum substanțele nutritive necesare dezvoltării, cât și modificări la nivel anatomic sau fiziologic, cum ar fi incompatibilitatea citoplasmatică sau lipsa unor structuri musculare importante pentru funcția de reproducere. Organismele cauzatoare de partenogeneză sunt intens studiate, printre acestea regăsindu-se și *Wolbachia*, despre care s-a demonstrat că este în componența microflorei a 16% dintre speciile de insecte. Gazdele infectate cu acest tip de endosimbiont prezintă în general incombatibilitate citoplasmatică, feminizare sau partenogeneză, *Wolbachia* inducându-le cu scopul de a-și asigura transmiterea de la o generație la alta a speciei infectate.

În cadrul acestui studiu au fost analizați indivizi de la specii partenogenetice, posibil partenogenetice, ori bisexuate, toate aparținând complexului *Eupelmus vesicularis*, utilizându-se diferite metode de biologie moleculară precum amplificarea unor gene de interes: gena ARNr 16S sau gena wsp, clonarea moleculară și secvențierea Sanger.

Din rezultatele obținute a fost posibilă determinarea exactă a organismelor endosimbionte, comparații privind bacteriile reieșite în urma analizei celor trei tipuri de specii – bisexuate, posibil partenogenetice sau partenogenetice, precum și determinarea grupurilor din care fac parte secvențele care indicau ca rezultat *Wolbachia*.

TAXONOMIE ȘI ECOLOGIE

SECȚIA: *GENERAL 1*

POSTERE

PHYSIOLOGICAL REACTIONS IN TOMATO VARIETIES GROWN IN UNPROTECTED AREAS IN RESPONSE TO SPECIFIC CHEMICAL TREATMENTS AGAINST DISEASES AND PESTS

Ciocan Ramona Mariana[1,*], Frunzete Mădălina Elena[1], Rodideal Tatiana[1], Zamfirache Maria Magdalena[1]

[1]Faculty of Biology, Alexandru Ioan Cuza University of Iași, Romania
*Corresponding author: ramonabiologie54@gmail.com

Tomatoes *Lyopersicon esculentum* L., family *Solanaceae*, with their high content of vitamin C, E, potassium, lycopene, β-carotene, and dietary fiber, have a unique role in the human diet, as well as an essential therapeutic activity (stimulates appetite, are sources of antioxidant compounds etc.).

This work aimed to examine several aspects of the biology of five tomato varieties: Ace 55 VF, Saint Pierre, Costoluto Fiorentino, Rio grande, and Cuor di bue. Plants were grown in unprotected open spaces and treated with Bravo 500, commonly used to control some diseases and pests. The treated and untreated plant material (leaves, stems, fruits) was examined three times in the ontogenetic cycle of tomatoes (vegetative, flowering, and fruiting stages). The investigated parameters were leaf area; growth rate in stem length; content of foliar assimilatory pigments; amount of water and foliar dry matter; number and weight of fruits per plant; content of carotenoid pigments in the epicarp, and mesocarp of fruits, and content of sugars in the mesocarp.

The growth process (growth rate of the foliar apparatus; the growth rate in the length of stems) of the tomatoes treated curatively or preventively with Bravo 500 was positively influenced. The plants subjected to the treatments in comparison with controls produced more fruits, larger in size but nutritionally poorer, with intensely coloured epicarp and less pigmented mesocarp.

Of the tomato varieties analysed, cultivated in unprotected areas, and treated against diseases and pests with Bravo 500, the most productive proved to be Saint Pierre, Costoluto Fiorentino, and Rio grande.

RESEARCH ON THE MORPHOLOGY AND MICRO-MORPHOLOGY OF THE SEEDS OF THREE SPECIES OF *SCUTELLARIA* L.

Rodideal Tatiana[1,*], Ivănescu Lăcrămioara-Carmen[1], Olaru Mihăiță Ștefan[1], Frunzete Mădălina-Elena[1], Zamfirache Maria-Magdalena[1]

[1]Faculty of Biology, Alexandru Ioan Cuza University of Iași, Romania
*Corresponding author: tatiana.rodideal@yahoo.com

This research aims to describe the seeds micromorphology and morphology of three *Scutellaria* species.
The seeds of analyzed species were obtained from the following institutions: the Botanical Garden ,,Alexandru Borza" in Cluj (seeds of *S. altissima* L.), the Botanical Garden of the University of Medicine, Pharmacy, Science and Technology ,,George Emil Palade" in Târgu Mureș (seeds of *S. altissima* L., and *S. hastifolia* L.), and from the Institute of Genetics, Physiology, and Plant Protection in Chisinau, Republic of Moldova (seeds of *S. baicalensis* Georgi).
The morphology of seeds was observed using the Olympus stereo zoom microscope SZX7, binocular, with a magnification range of 0.8x to 5.6x. In order to be observed under the Vega Tescan II SBH Scanning Electron Microscope (SEM), the seeds were subjected to metallization (±95% pure gold coating) using the EMS 550x metalizer. After three consecutive metallization, the seeds were coated with three gold foils, with a thickness of 10 - 15 nm, and then scanned using a 30 kV electron beam. Micrographs were taken at a magnification power between 500 µm - 20 µm and used to measure the width and length of seeds in µm using ImageJ software. The obtained results were compared with the available literature data.
We observed that seed size is not uniform, even within the same species. Across all analyzed species, seed length exceeded seed width. Additionally, in the case of *Scutellaria altissima* L. and *Scutellaria hastifolia* L. seeds, there were no significant differences in external morphology.
According to the observations of other researchers, the morphology and micromorphology of *Scutellaria* L. seeds play a significant role in the identification and classification of species within the genus *Scutellaria* L.

RESEARCH REGARDING THE NUTLETS MICROMORPHOLOGY OF SPECIES BELONGING TO THE GENUS *ECHIUM* L. (*BORAGINACEAE* FAMILY)

Sava Alexandra-Roxana[1,*], Zamfirache Maria-Magdalena[1], Costică Naela[1]

[1]Faculty of Biology, Alexandru Ioan Cuza University of Iași, Romania
*Corresponding author: shealex95@gmail.com

The study presents the results of the micromorphological analysis results of the nutlets of four species of the genus *Echium* L., respectively: *Echium vulgare* L.*, Echium amoenum* Fisch. and Mey.*, Echium russicum* J. F. Gmel. and *Echium italicum* L. using the scanning electron microscope (SEM). The plant material used for SEM analysis comes from batches of seeds purchased from "Jelitto perennial seeds", Germany (for *Echium vulgare* L. - EA020, *Echium amoenum* Fisch. and Mey. - EA015 and *Echium russicum* J. F. Gmel. - EA017), as well as from samples collected from the

vicinity of the Biological Station Navy "Prof. Dr. Ioan Borcea", Agigea, Constanța (for *Echium italicum* L.).
The investigations were made with the Tescan Vega II scanning microscope, which is owned by the Faculty of Biology of the "Alexandru Ioan Cuza" University in Iași. The nutlets were analyzed from a micromorphological point of view, both on the ventral and dorsal sides, highlighting the types of ornamentation (simple and in the form of protuberances) and their density.
The results illustrate that there are micromorphological differences, at the level of the analyzed surfaces, between the nutlets of the studied *Echium* L. species. The differences are represented by the abundance of simple and prominent ornaments, in the form of protuberances, in relation to the shape and dimensions of the nutlets.

STUDY OF SOIL MESOFAUNA IN SOME PROTECTED GRASSLAND AREAS IN THE NORTH-EASTERN PART OF ROMANIA

Călugăr Adina[1,*]

[1]Institute of Biological Research of Iași, Iași, România
* Corresponding author: adina.calugar@icbiasi.ro

The investigations were carried out in two Natura 2000 protected areas. A qualitative and quantitative analysis of the edaphic mesofauna in representative ecological plots from these two protected meadows was conducted. We considered both the grasslands within the strictly protected areas and their buffer zones for sampling. The aim was to estimate the overall density of mesofauna, as well as of each group and the relevant numerical relationships among microarthropods for a functional perspective. Our results indicate the highest density of soil microarthropods in the Mârzești grassland. However, we observed that in the buffer zone of both sites, the density is lower than in the strictly protected area. Among mites *Trombidiformes* and *Oribatida* are predominant both at Mârzești and Bârca reserves. The identified stressors are grazing activities and the preceding drought period before sample collection. The latter had a negative impact on whole groups of mesofauna, but especially on drought-sensitive groups of mesofauna, such as *Astigmatina* and *Entognatha*, which are nearly absent in the samples provided from both sites. Another feature of the communities studied is the horizontal distribution of the populations, as determined by the standard deviation and Pearson's coefficient of variation (s%). The results indicate an aggregate distribution of the main microarthropod groups, suggesting less favorable conditions for these organisms. In conclusion, our findings demonstrate that human activity and climatic variability can significantly influence the composition and density of edaphic mesofauna in Natura 2000 sites. Identifying the stress factors is essential for the protection of biodiversity and ecosystem resilience in these areas.
This work was supported by the Core Program within the National Plan for Research, Development, and Innovation 2022-2027, developed with the support of the Romanian Ministry of Research, Innovation, and Digitalization, project 7N/23020402/2023.

REDESCRIPTION OF *SCOLELEPIS TRIDENTATA* (SOUTHERN, 1914) (*ANNELIDA*: *SPIONIDAE*), WITH DESCRIPTION OF A NEW SPECIES OF *SCOLELEPIS* FROM THE BLACK SEA

Surugiu Victor[1,*]

[1]Faculty of Biology, Alexandru Ioan Cuza University of Iași, Iași, România
* Corresponding author: vsurugiu@uaic.ro

Scolelepis Blainville, 1828 is one of the most speciose and taxonomically difficult genera of spionid polychaetes. The genus is commonly divided into two subgenera. The subgenus *Scolelepis* Blainville, 1828 includes species with blunt or conical, uni-, bi- or tridentate hooded hooks with falcate or straight shafts and having smooth palpal sheaths, while the subgenus *Parascolelepis* Maciolek, 1987 includes species having sharp, multidentate hooks with curved shafts and with papillated palpal sheaths.

In the Black Sea two species have been formerly reported as belonging to the subgenus *Parascolelepis* – *Scolelepis (Parascolelepis) tridentata* (Southern, 1914) and *S. (P.) cantabra* (Rioja, 1918) (both as either *Nerinides* or *Pseudomalacoceros*). Both species are quite rare in the Black Sea and when found are usually fragmentary.

The examination of material in the collection of the “Grigore Antipa” National Museum of Natural History in Bucharest (Romania) labelled ‘*Nerinides cantabra’*, revealed specimens belonging to two different species preserved in the same vial. One of them was identified as *Scolelepis cantabra*, while the second resembled more *S. (P.) tridentata*. To clarify the taxonomic identity of *Parascolelepis* from the Black Sea, the type series of *S. (P.) tridentata* and non-type specimens of *Scolelepis cantabra* were examined. The type material of *Scolelepis cantabra* is not known to exist. Nonetheless, based on literature data and personal observations, the latter taxon clearly belongs to the subgenus *Scolelepis* s. str. The examination of additional specimens received from the Ukrainian and Russian coasts of the Black Sea, identified as *Pseudomalacoceros tridentata* or as *Nerinides tridentata*, revealed that they differ from the nominal species in several characters and warrants designation as a new species.

TAXONOMIE ȘI ECOLOGIE

Workshop: ***Aplicații ale anatomiei vegetale în cercetarea criminalistică***

APPLICATIONS OF PLANT ANATOMY IN FORENSIC RESEARCH

Ivănescu Lăcrămioara[1,*], Olaru Ștefan[1]

[1]Faculty of Biology, Alexandru Ioan Cuza University of Iași, Iași, România
* Corresponding author: ivanescu@uaic.ro

Pharmaceutical products of plant nature sold under the generic name of *teas* are represented by mixtures of plant fragments, chopped at various sizes and which studies of the last decade show to be increasingly more often to be compromised. In this sense, we belive that a correct examination of these products must include a scanning electron microscopy (S.E.M.) analysis to complete the chemical determinations (which sometimes happen to be the only methods of determination used).

Creating a database with photomicrographs of the contents of batches of vegetable products would make the providers and the competent institutions that issue compliance notices responsible for their actions, and consumer protection would take a step forward in terms of respecting quality standards.

BIOLOGIE EXPERIMENTALĂ ȘI MOLECULARĂ

SECȚIA: *GENERAL 2*

COMUNICĂRI ORALE

SKIN TISSUE ENGINEERING: THE POTENTIAL USE OF SEA BUCKTHORN OIL AND LAVENDER ESSENTIAL OIL

Grigoras Valentin[1,*], Cretu Ruxandra[1], Stefanache Camelia[1], Trifan Adriana[2,1]

[1]“Stejarul” Biological Research Centre, Alexandru cel Bun 6, Piatra Neamt, NIRDBS Bucharest, Romania
[2]Faculty of Pharmacy, “Grigore T. Popa” Univ. of Medicine and Pharmacy, Iasi, Romania
*Corresponding author: valygrigoras@yahoo.com

The aim of the study was to evaluate the phytochemical profile of three vegetal oils which will be used as mixtures integrated in a hybrid gel bio-structure based on a natural/synthetic polymer matrix enriched with active ingredients.
Two fixed oils (FOSBx) of sea buckthorn fruits (*Hippophae rhamnoides* L.) from different manufacturers and one essential oil (EOL) of lavander inflorescences (*Lavanda angustifolia* Mill.) were evaluated.
Sea buckthorn oil contains carotenoids (e.g. zeaxanthin, ß-carotene, licopene, lutein), fat soluble vitamins (tocopherols), polyphenols, phytosterols, unsaturated fatty acids etc. Linolic, linolenic, oleic and linoleic acids have beneficial effects on skin disorders; carotenoids have antioxidant action, stimulate collagen synthesis and epithelization, and polyphenols antioxidant and cytoprotective properties. Lavander essential oil has anti-inflammatory, antibacterial, antioxidant, antiseptic effects and is used in skin disorders treatment, mainly due to its content in linalool and linalyl acetate.
EOL was analyzed by GC-MS. Derivatization of fatty acids from FOSBx was performed by FAME method, the analysis being made by GC-MS. Free fatty acids were determined using standard CA 5a-40 as method. Spectrophotometry was used to quantify total carotenoids. Total polyphenols were evaluated by Folin-Ciocalteu method, after a previous SPE extraction.
EOL extracted by hidrodistillation contains as major components: linalool 17.71%, α-terpineol 7.31%, linalyl acetate 6.77%, 1,8-cineole 5.75%, 4-terpineol 4.89%, lavandulyl acetate 4.74%. GC-MS analysis of FOSBx highlighted 2 saturated fatty acids (palmitic and stearic) and 6 unsaturated fatty acids (myristic, palmitoleic, oleic, vaccenic, linoleic and linolenic) with a specific chemical profile for each sample: ethanol-based extraction sample has a higher content of palmitic and palmitoleic acids while sunflower oil-based extraction sample has higher amounts of oleic and linoleic acids. These differences are caused by the origin of the raw material (wild flora or conventional cultures) and/or by pedo-climatic features, as well as type of extraction technology.
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TRANSCRIPTOMIC STUDY OF NICOTINE CATABOLISM IN *PAENARTHROBACTER NICOTINOVORANS* ATCC 49919 USING DIRECT RNA SEQUENCING

El-Sabeh Amada[1,*], Mihășan Marius[1]

[1]BioActive Research Group, Department of Biochemistry and Molecular Biology, Alexandru Ioan Cuza University, Iasi, Romania
*Corresponding author: amadaelsabeh@gmail.com

Introduction: *Paenarthrobacter nicotinovorans* ATCC 49919 is an actinobacterium that can degrade toxic nicotine by using a cluster of 40 genes encoded by the pAO1 megaplasmid. The nicotine catabolic genes are sequenced and there is extensive knowledge on the function of most of them. However, the mechanisms which regulate nicotine catabolism and the interplay between the degradation pathway encoded by pAO1 and the general metabolism of the cell are unexplored.
Materials and methods: The bacterium was grown on citrate medium with and without nicotine. Cells were harvested at three timepoints correlated with nicotine catabolism. Native RNA was extracted and polyadenylated for sequencing adapter ligation. Library preparation was performed with the Oxford Nanopore Technologies (ONT) Direct RNA sequencing kit (SQK-RNA002). Libraries were sequenced with the ONT MinION Mk1B device coupled to a Flongle adapter. Raw data was basecalled with Guppy_6.3.2 and its high accuracy algorithm. The basecalled data was processed and assessed for differential gene expression between control and nicotine-treatment using the nf-core/nanoseq v3.1.0 pipeline.
Results: The sequencing runs yielded 1 million reads totalling over 1 Gb, 80% of which had quality scores above 7. The basecalled data and files used for differential expression analysis are available in the NCBI GEO database (accession no. GSE240220). Of the 40 identified genes with nicotine-related expression (padj < 0.1; abs(log2FoldChange) > 1), less than half were previously known to be involved in nicotine catabolism, most being reported here first.
Conclusions: This work is among the first bacterial transcriptomic studies using the MinION Flongle. Differential expression analyses identified over 20 novel genes suggested here as having nicotine-related expression. This first transcriptomic analysis of nicotine catabolism in *P. nicotinovorans* ATCC 49919 should facilitate the development of a metabolic model of nicotine degradation based on multi-omics and aid the environmental and biotechnological applications of this useful strain.

ANTIBIOFILM ACTIVITY OF A SYNTHETIC FLAVONOID AGAINST *CANDIDA GLABRATA*

Ene Ionela-Mihaela[1], Bîrsă Lucian Mihail[2], Ștefan Marius[1,*]

[1]Faculty of Biology, Alexandru Ioan Cuza University of Iasi, Romania
[2]Faculty of Chemistry, Alexandru Ioan Cuza University of Iasi, România
*Corresponding author: stefanm@uaic.ro

Currently, infections caused by *Candida* biofilm forming species are becoming increasingly challenging to treat due to their recurrence, chronicity, and growing drug resistance. The discovery

of new molecules is a high medical priority in addressing this issue. Synthetic flavonoids could be a reliable solution due to their important antimicrobial activity. Therefore, we report here the potent in vitro antifungal and anti-biofilm activity of ClCl-flav - a synthetic tricyclic flavonoid. Minimum inhibitory/fungicidal concentration, inhibition of biofilm formation and disruption of mature biofilms were assessed to evaluate the antifungal and anti-biofilm potential of Cl-Cl-flav. Our results showed that flavonoid Cl-Cl exhibited significant antifungal activity against a clinical isolate of *Candida glabrata*, with a minimum inhibitory concentration (MIC) of 31.25 µg/mL and a minimum fungicidal concentration of 62.5 µg/mL. Furthermore, Cl-Cl-flav displayed the capacity to inhibit biofilm formation at subinhibitory concentrations, impeding biofilm formation up to 80% at concentrations equivalent to ½ × MIC, ¼ × MIC, and ⅛ × MIC. A 70% disruption of mature biofilms compared to control was recorded at concentrations as low as 3.9 µg/mL. It's important to note that Cl-Cl-flav showed a more important anti-biofilm activity in comparison to fluconazole, a commonly used antifungal agent. Thus, this synthetic flavonoid emerges as a potential novel antifungal agent to combat biofilm related infections caused by *C. glabrata*.

GLYCEROL INCREASES TRANSGLUTAMINASE PRODUCTION BY A *STREPTOMYCES MOBARAENSIS* STRAIN

Strungariu Ioan[1,*], Dumitrascu Mirela[2], Nechita Elena[2], Ștefan Marius[1]

[1]Biology Department, Alexandru Ioan Cuza University of Iasi, Iasi, Romania
[2]MIB TH laboratory, Iasi, Romania
*Corresponding author: ionut.strungariu@yahoo.com

Microbial transglutaminase is an enzyme of biotechnological importance, used in various fields such as bakery, meat, dairy, pharmaceutical or cosmetic industry. The practical applications of the enzyme are varied, from improving the texture of cheeses to prevent the separation of whey from milk to increasing the adhesion of cosmetics to ensure uniform application. In this context, we tested different carbon sources with the aim of optimizing transglutaminase production, using a *Streptomyces mobaraensis* strain. Glycerol, dextrin, maltodextrin, sorbitol and molasses were used as a carbon source for preparation of the culture medium. Enzyme activity was evaluated by a spectrophotometric method, using N-carbobenzoxy-L-glutamyl-glycine as a substrate. Also, parameters such as the pH of the culture medium, the biomass and the morphological aspect of the culture were assessed. Among all the carbon sources used, glycerol allowed the recording of the highest enzyme activity (0.84 IU/mL). Compared to the other sources tested, the use of glycerol led to a significant improvement in enzyme activity of up to 33.97%. The use of dextrin in the composition of the culture medium increased the biomass, values being higher compared to glycerol. The lowest pH value (5.6) was recorded in the case of glycerol. The micro-morphological analysis did not reveal any significant differences between the cultures grown in the presence of different carbon sources. pH influences biomass and enzyme activity. The results obtained indicate that glycerol had a significant positive impact on transglutaminase biosynthesis compared to the other carbon sources tested.

A MASS SPECTROMETRY-BASED INVESTIGATION OF HUMAN SERUM FROM DONORS WITH BREAST CANCER TO IDENTIFY PROTEIN BIOMARKERS FOR EARLY BREAST CANCER DETECTION

Whitham Danielle[1,*], Haaker Norman[1], Seymour Logan[1], Pentecost Brian[1,2], Darie Costel C.[1]

[1]Biochemistry & Proteomics Laboratory, Department of Chemistry & Biomolecular Science, Clarkson University, Potsdam, NY
[2]Department of Veterinary and Animal Science, University of Massachusetts Amherst, Amherst, MA, United States
*Corresponding author: whithad@clarkson.edu

Breast cancer (BC), is a leading cause of death for women globally. An invasive ductal carcinoma (IDC) is one of the most common subtypes, accounting for 85% of all BCs. General screening methods rely on detection of masses by physical examination and/or lesions identified by X-ray mammography. Current biologic markers (DNA, RNA, proteins) assess risk of disease progression or monitor response to treatment, rather than detect BC early. Thus, early diagnosis and treatment of BC is crucial. One way to detect BC in its early phase is through identification of proteins that are dysregulated due to the onset of BC (i.e. protein biomarkers). Mass spectrometry (MS)-based proteomic methods can be used for the investigation of protein biomarkers. Here, utilizing MS-based proteomic methods, we can quantify protein differences from women with BC and without, and if significant proteins are consistently dysregulated, this could lead to a protein biomarker for BC, therefore aiding in earlier diagnosis and treatment. Using serum from women with BC and the matched controls, we are able to perform both in-gel and in-solution based proteomic methods followed by nano-liquid chromatography tandem mass spectrometry (nanoLC-MS/MS) to identify proteins which are dysregulated between the matched pair, and also quantify them. Therefore, proteins found to be differentially expressed between the BC and control samples could be further quantified using targeted proteomics to determine a protein biomarker for BC which could aid in the diagnosis, prognosis and treatment.

IN VITRO EVALUATION OF THE CYTOTOXIC EFFECT OF SODIUM METABISULPHITE (E223) ON NORMAL MAMMALIAN CELLS

Vochita Gabriela[1,*], Mihai Cosmin-Teodor[1,2], Rosu Craita Maria[1], Gherghel Daniela[1]

[1]Department of Experimental and Applied Biology, Institute of Biological Research Iasi, 47 Lascar Catargi Str., 700107 Iasi, Romania
[2]Praxis Medical Investigations, 700505 Iasi, Romania
*Corresponding author: gabrielacapraru@yahoo.com

The aim of the present study was to describe the sodium metabisulphite (E223) interaction with two normal epithelial cell lines, i.e. MCF-12A (ATCC® CRL-10782) and Vero (ATCC® CCL-81) cells, exposed for 24 and 48 hours to 12.5, 25, 50 and 100 µg/mL of this food additive. Cell sensitivity was assessed using MTT (3-[4,5-dimethylthiazol-2-yl]-2,5 diphenyl tetrazolium bromide), method based on MTT conversion to formazan crystals by living cells, thereby determining mitochondrial activity which is correlated with the number of viable cells. Sodium metabisulphite (SMB), also known as sodium pyrosulphite (Na2S2O5), is a synthetic food additive widely used as a

preservative with antioxidant and antibacterial action in a variety of food products (fruits, greens, seafood, and alcoholic beverages), but it is also used in the pharmaceutical industry as an excipient to improve the stability of the active components in some drugs.
In the case of Vero cells, the 24-hour treatment caused a decrease in cell viability from 91.15% (12.5 µg/mL) to 76.56% (100 µg/mL), the decrease which became more noticeable after 48 hours of treatment, the cell viability reaching values of 77.64% (12.5 µg/mL) and 52.63% (100 µg/mL).
The response of MCF-12A cells to the application of SMB for 24 hours was insignificant, cell viability varying between 95.01 (12.5 µg/mL) and 85.57% (100 µg/mL). However, the 48-hour treatment with SMB at the same doses resulted in more pronounced decrease in cell viability. Thus, at the minimum dose of 12.5 µg/mL the cell viability value was 69.48%, and at the maximum tested dose (100 µg/mL) the value was 52.97%, corresponding to notable cytotoxic effects.
For both cell lines, the clonogenic growth capacity, expressed by the ability of cells to reproduce themselves, decreased with the increase of SMB dose, the process being associated with the decrease of the cells adhesion to the substrate.
This work was supported by the Core-Program, within the National Plan for Research, Development and Innovation 2022-2027, developed with the support of the Romanian Ministry of Research, Innovation and Digitalization project, 7N/23020402/2023.

BIOLOGIE EXPERIMENTALĂ ȘI MOLECULARĂ

SECȚIA: *GENERAL 2*

POSTERE

BIOFILM FORMATION UNDER ABIOTIC STRESS BY *BACILLUS VELEZENSIS* P3.3S – A PLANT GROWTH PROMOTING BACTERIA

Mantea Loredana-Elena[1,*], Olaru Ștefan[2], Mihășan Marius[1], Krier Francois[3], Ștefan Marius[1]

[1]BioActive Research Group, Alexandru Ioan Cuza University of Iasi, Iasi, Romania
[2]Faculty of Biology, Alexandru Ioan Cuza University of Iasi, Romania
[3]UMR-T 1158, BioEcoAgro, University of Lille, Lille, France
*Corresponding author: mantealoredana9@gmail.com

The ability of plant growth promoting bacteria used as biofertilizers to form biofilms appears to be of great importance in agriculture, as bacterial colonization of the plant root surface is an important step in many plant-beneficial activities. In addition, biofilms provide a protected growth pattern and advantages in harsh environments. Therefore, the aim of this study was to evaluate the influence of abiotic stress on biofilm formation by *Bacillus velezensis* P3.3S. First, genes involved in biofilm formation were identified in the draft genome of strain P3.3S, annotated with NCBI PGAP, using the BLAST algorithm. Biofilm formation ability under abiotic stress (pH, salinity, drought) was assessed by crystal violet method and biofilm architecture was visualized by scanning electron microscopy (SEM). BLAST analysis identified 47 genes involved in biofilm formation and production of extracellular polymeric substances, the most important being: spo0A,

tapA, sipW, tasA, sinR, sinI, ylbF, ymcA, yua, epsC-O. The potential of the strain to form biofilm decreased with increasing pH and NaCl concentration, with the highest amount of biofilm recorded at pH 6 and 10 g/l NaCl. On the other hand, the amount of biofilm increased with PEG 8000 concentration up to 15%, after which the amount of biofilm remained approximately constant at 17.7% and 20% PEG 8000. SEM images show that the morphology of the biofilm formed varies according to the stress condition studied. In conclusion, the strain *Bacillus velezensis* P3.3S remains strongly adherent, suggesting that it could be used as a biofertilizer in stressed soils.

THE IMPORTANCE OF GENETIC FACTORS IN THE DETERMINISM OF MALIGNANT LYMPHOMAS

Saragea Paula Denisa[1,*], Tudose Cristian[1]

[1]Faculty of Biology, University „Alexandru Ioan Cuza” of Iași, Iași, Romania
*Corresponding author: paula_denisa_2000@yahoo.com

Hodgkin and non-Hodgkin lymphomas are lymphoproliferative diseases well known for their complexity and genetic heterogeneity; their onset is insidious and are frequently diagnosed in advanced, even terminal, stages.

Trying to asses the importance of genetic factors in the determinism of malignant lymphomas we studied a group of patients investigated in the Clinics of Haematology in Iași (from 2010 to 2019). In accordance with literature data, our study shows the fact that malignant lymphomas occupy an important place in the large group of lymphoproliferative diseases. For the majority of the studied cases we observed the lack of familial antecedents and we concluded that genetic factors had a minor part in their determinism and the recurrence risk is reduced (2-4%). Predisposing diseases (Rheumatoid Polyarthritis, LES, HIV, EBV), environmental carcinogens and the region of residence are playing important parts in their determinism. Aged persons from urban agglomerations, especially males are more frequently diagnosed early because of the better access to medical services. In the case of the less frequent patients with genetic predisposition we recommended family inquiry and the calculation of recurrence risk in the view of family genetic counselling. The highest recurrence risks were recorded for patients with both parents affected and then for patients with one first degree and one second degree relative affected.

Eventually, we emphasize the importance of the implementation for the entire Romanian population of better preventive actions for the early diagnose of lymphomas.

COMPETITIVENESS EVALUATION IN THE INVASIVE SPECIES *AMORPHA FRUTICOSA* FROM THE FOREST PLANTATIONS OF THE JIJIA PLAIN THROUGH ECOPHYSIOLOGICAL AND MORPHOLOGICAL PARAMETERS

Acatrinei Ligia[1,*], Boz Irina[2,1]

[1]NIRDBS – Institute of Biological Research, Iași, Romania
[2]Faculty of Medicine and Biological Sciences, Stefan cel Mare University of Suceava, Romania
*Corresponding author: acatrineil@yahoo.com

Amorpha fruticosa L. (indigo bush) is an invasive shrub native to North America with great ecological plasticity now widespread in most of the northern hemisphere, being sometimes sub-spontaneous, distributed in a wide range of habitats (riparian and alluvial habitats, coastal dunes, also in disturbed and anthropogenic areas) (Grabic et al., 2022; Doroftei et al., 2005; Dumitrașcu et al., 2013).

The purpose of this study is to analyse photosynthetic capacity (rate of the instantaneous photosynthesis, the respiration, the transpiration and the stomatal conductance) and photo-assimilatory compounds (chlorophylls and carotenoids) as ecophysiological parameters and, morphological parameters in leves and fruits, in order to establish the competitiveness of *Amorpha fruticosa* as a strategy of invasive behaviour. The investigation was carried in wetlands plantation, in floodplain of the Jijia river (Golăești), northeastern part of Romania. Photosynthesis rate registered higher values in *Amorpha fruticosa* (18.03 µmol $m^{-2}s^{-1}$) in comparison with *Quercus petraea* (6.14 µmol $m^{-2}s^{-1}$), and with *Prunus spinosa* (10.22 µmol $m^{-2}s^{-1}$) both situated nearby and a value of 3.41 µmol $m^{-2}s^{-1}$ in distanced individuals from the competitor species. *Amorpha fruticosa* registered a higher rate of respiration (9.41 µmol $m^{-2}s^{-1}$) than *Quercus petraea* and *Prunus spinosa* which almost registered 6 µmol $m^{-2}s^{-1}$, but excepting the isolated individuals (1.07 µmol $m^{-2}s^{-1}$). Transpiration was direct proportional with photosynthesis rate and with stomatal conductance. The A/E ratio (photosynthesis in rapport with transpiration) was higher in *Amorpha fruticosa* (10.22 µmol CO_2 mmol H_2O^{-1}) than in *Quercus petraea* and *Prunus spinosa* leaf, revealing that a superior water management in case of invasive plants than native species. Morphological traits such as inflorescence length, number of fruits per raceme, length of the leaf rachis, the number of leaflets per leaf presented slightly differences between the analyzed individuals Competition strategy of *Amorpha fruticosa* was different depending on various characteristic of competitor species.

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CHEMICAL COMPOSITION OF ESSENTIAL OILS IN *LAVANDULA ANGUSTIFOLIA* MILL. CV. ‘CODREANCA’

Ștefan Gabriela-Alina[1,*], Miron Anca[2], Aprotosoaie Ana Clara[2], Zamfirache Maria-Magdalena[3], Ivănescu Lăcrămioara[3], Lucian Dragoș Gorgan[3]

[1]„Ștefan cel Mare” University of Suceava, Faculty of Medicine and Biological Sciences, Suceava, Romania
[2]Department of Pharmacognosy, Faculty of Pharmacy, University of Medicine and Pharmacy “Grigore T. Popa” Iasi, Romania
[3]Alexandru Ioan Cuza University of Iaşi, Faculty of Biology, Iași, Romania
*Corresponding author: gabriela.stefan@usm.ro

Species belonging to the *Lavandula* genus have many pharmacological and industrial properties, with great economic importance in terms of the presence of essential oils.
The purpose of this study is to analyze the chemical composition of essential oil of *Lavandula angustifolia* Mill. cv. ‘Codreanca’. The experiment was carried out in a protected (unheated greenhouse) and unprotected (field) space. To achieve the objectives proposed in this experiment, plants of the species *Lavandula angustifolia* Mill. cv. ‘Codreanca’ were used, with three experimental variants, respectively: watered with H2O (v1); watered with standard Hoagland nutrient solution (v2); watered with Hoagland nutrient solution containing a double amount of K (v3). The plant material was collected, in the flowering period, in June 2019. The essential oil was extracted by hydrodistillation according to European Pharmacopoeia standards. The separation and the identification of the components have been carried out using GC-MS (gas chromatography coupled with mass spectrometry).
Following the analysis of the chemical composition of the essential oil, more than 60 compounds were identified in the ‘Codreanca’ variety, including, in high concentrations, linalool, linalyl acetate, eucalyptol, borneol, terpinen-4-ol, camphor, lavandulyl acetate and caryophyllene oxide. Linalool and linalyl acetate being the most abundant monoterpenes identified.

SCREENING OF THE SODIUM BENZOATE (E211) ACTION ON THE CYTOPHYSIOLOGY OF SOME NORMAL CELL SYSTEMS

Gherghel Daniela[1,*], Mihai Cosmin-Teodor[1,2], Vochita Gabriela[1]

[1]Department of Experimental and Applied Biology, Institute of Biological Research Iasi, 47 Lascar Catargi Str., 700107 Iasi, Romania
[2]Praxis Medical Investigations, 700505 Iasi, Romania
*Corresponding author: daniela_gherghel@yahoo.com

This research is focused on cellular response to sodium benzoate (E211) application in two normal mammalian cells, namely MCF-12A (ATCC® CRL-10782) and Vero (ATCC® CCL-81), purchased from American Type Culture Collection (ATCC). The monitored parameters were cell viability (MTT assay), cell morphology (optical microscopy) and cell survival (clonogenic assay).
Cell viability was investigated after 24- and 48-hour treatment with the compounds added to the culture medium (300 µL/ well), in doses of 12.5; 25; 50 and 100 µg/mL.

Variable cellular responses were obtained depending on the concentration, the duration of the treatment, as well as the tested cell line. Therefore, the 24-hour treatment with E211 of Vero monkey kidney cells revealed, at the dose of 12.5 µg/mL, a negligible effect on cell viability (94.23%), and at the dose of 100 µg/mL the negative impact on cell viability was higher (77.65%). The 48-hour treatment was followed by a decrease in cell viability, with values of 81.58% (12.5 µg/mL) and 67.62% (100 µg/mL), respectively. In MCF-12A cells, 24-hour treatment with the additive resulted in negligible interference with cell viability, of 95.71% (12.5 µg/mL) and 90.98% (100 µg/mL). In contrast, the 48-hour treatment determined a strong negative effect on cell viability starting with the dose of 12.5 µg/mL (65.37%), which was accentuated at the dose of 100 µg/mL (51.24%). The more pronounced cytotoxic effect of sodium benzoate on human MCF-12A cells compared to monkey Vero is evident.
The morphological damage of Vero cells when treated with E211 is more intense that of MCF-12A cells, the decrease in the adherence ability to the substrate being observed at the high tested concentrations.
Clonogenesis capacity decreases significantly with increasing dose for lung fibroblasts Vero cells, and for MCF-12A cells it initially increases.
This work was supported by the Core-Program, within the National Plan for Research, Development and Innovation 2022-2027, developed with the support of the Romanian Ministry of Research, Innovation and Digitalization project, 7N/23020402/2023.

COMPARATIVE ANALYSIS OF *PAENARTHROBACTER NICOTINOVORANS* GROWTH CURVES ON RELATED MEDIA

Pioară Mihaela[1], Abalașei Marinela[1], Mihășan Marius[1,*]

[1]Faculty of Biology, University „Alexandru Ioan Cuza” of Iași, Iași, Romania
*Corresponding author: marius.mihasan@uaic.ro

Paenarthrobacter nicotinovorans (initially named *Arthrobacter oxidans*, the *A. nicotinovorans*) has been extensively studied due to its unusual metabolic characteristic – the ability to metabolize nicotine. If nicotine replaces glucose in the growth medium, an intense blue colored pigment is formed during the growth of the microorganism and nicotine is depleted usually within 48 hours. The current study aims to establish a culturing system that would allow sampling of all growth phases of the microorganisms within 24 hours. This is required for future studies such as transcriptomics or proteomics analysis. Cells were grown on 3 different media (citrate with yeast extract, citrate with biotin, minimal media with biotin) at 28oC and 190 rpm. Samples were tacked every hour and centrifuged. Supernatant was collected, blue pigment levels measured at 580 nm and nicotine concentration measured by HPLC. Cells were washed and the turbidity was measured at 600 nm. All data was recorded in triplicate, analyzed with the Data Analysis tool pack and plotted using Microsoft Excel.
The main finding is that a 10 ml pOA1+ preculture grown for 24 hours used to inoculate a 100 ml medium gives the best results. In the case of the citrate with yeast extract medium, the bacterial density is higher for both strains and the biomass accumulates the fastest. The accumulation of blue pigment in the minimal with biotin medium on the other hand occurs in a longer time and the blue-pigment is most stable.

In conclusion, a protocol that allows the sampling of all the major growth phases of a *Paenarthrobacter nicotinovorans* culture withing 24 hours have been established. The key aspect is using 10X more inoculum compared with the standard growth system described in the literature for this strain.

USING THE CRISPR CPF1 AND DCASI9 SYSTEMS TO MODIFY THE METABOLISM IN *PAENARTHROBACTER NICOTINOVORANS* ATCC 49919

Munteanu Iustin-Tiberius[1,*], Mihășan Marius[1]

[1]Faculty of Biology, University „Alexandru Ioan Cuza” of Iași, Iași, Romania
*Corresponding author: tibimunteanu897@gmail.com

Paenarthrobacter nicotinovorans ATCC 49919 is a nicotine degrading microorganism (NDM) with biotechnological potential for the production of compounds of industrial and pharmaceutical importance like 6-hydroxy-L-nicotine. In the present study we aim to develop a genetic engineering tool based on the CRISPR system that would allow fast and easy editing of the *P. nicotinovorans* genome to increase its biotechnological potential. Our aim is to inactivate or drastically reduce the expression of 6-hydroxy-L-nicotine oxidase (6hlnO), the key enzyme that catabolizes the conversion of 6-hydroxy-L-nicotine (6-HLN) to 6-hydroxy-methylmyosmine (6-HMM).

Two distinct approaches have been used to inactivate the gene of interest. One is based on the CRISPR-Cpf1 system and aims to completely knock-out the 6hlnO gene by deleting it. Genes containing the CRISPR-Cpf1 system from plasmid pJYS3-DcrtYF have been transferred into the pART2 plasmid using Gibson assembly, resulting the pART2-Cpf1 plasmid. We are in the process of targeting the CRISPR-Cpf1 system for 6hlnO by cloning a crRNA sequence and corresponding protospacers into the pART2-Cpf1.

The second approach is based on the CRISPR/dCasi9 system and allows partial and controlled inactivation of the 6hlnO gene transcription. Thus, the CRISPR/dCasi9 system has been targeted to the gene of interest by cloning a 20 bp spacer with the sequence complementary to the 6hlnO gene into the pCasiART plasmid using the Golden-Gate assembly method and the pCasiART-D6hlnO have been obtained. The resulting plasmids have been introduced into *P. nicotinovorans* by electroporation.

Experiments are underway for evaluating the efficiency of 6hlnO gene inactivation of the two constructs: pART2-Cpf1-D6hlnO and pCasiART-D6hlnO. For this, cultures in liquid-broth will be performed and samples at regular intervals will be analyzed by HPLC for quantification of nicotine and 6HLN levels.

COMPARATIVE ANALYSIS OF 61 PLASMIDS RELATED TO PAO1

Tanas Mihaela[1], Mihășan Marius[1,*]

[1]BioActive Research Group, Alexandru Ioan Cuza University of Iasi, Iasi, Romania
*Corresponding author: marius.mihasan@uaic.ro

pAO1 megaplasmid of *Paenarthrobacter nicotinovorans* is a large conjugative catabolic plasmid best known for its nic-genes cluster, a set of genes encoding a catabolic pathway for nicotine degradation. The nic-genes have a lower G + C content than the megaplasmid's average suggesting that have been acquired by horizontal gene transfer. pAO1 provide a model for studying the molecular evolution of catabolic pathways and their spread by horizontal gene transfer via soil bacterial plasmids. The current work attempts to perform a comparative analysis of all the available plasmids belonging to *Arthrobacter, Paenarthrobacter, Rhodococcus* and *Nocardioides* strains. Plasmid sequences have been downloaded from Genbank. Only complete and circular sequences were taken into account. Digital DNA-DNA hybridization (dDDH) values were calculated with formula d4 using Genome-to-Genome Distance calculator (GGDC) 3.0 and average nucleotide identity (ANI) values with OrthoANI. Data was visualized with Heatmapper (http://www.heatmapper.ca/). Hierarchical clustering was performed by average linkage and Euclidean distances were calculated. dDDH values from the pairwise comparation of the 61 plasmids allowed us do identify one major cluster containing 9 plasmids with highly similar sequences. All these plasmids belong to *Arthrobacter* and *Paenarthrobater* strains and are highly similar with the pAO1 plasmid of *Paenarthrobacter nicotinovorans* ATCC49919. A second smaller cluster containing plasmids pA, pB, pC from P. urefaciens strain AT, pADNL1 from P. urefaciens strain DnL1-1, and pTC1 from *P. aurescens* strain TC1 can also be described. ANI data on the other hand shows the existence of only two major plasmid clusters – one that contains plasmids belonging to *Arthrobacter/Paenarthrobacter*, and one belonging to *Rhodococcus* strains. Tacking into account that dDDH was calculated using the full DNA sequences of the plasmids, while ANI was calculated tacking into account only orthologues genes, this difference in clustering is expected and shows the existence of a core set of genes common for *Arthrobacters* and a different core set for *Rhodococus*.

COMPARATIVE ANALYSIS OF 14 *PAENARTHROBACTER* GENOMES

Ghirvu Bogdan-Ioan[1], Mihășan Marius[1,*]

[1]BioActive Research group, Biology Department, Alexandru Ioan Cuza University of Iasi, Iasi, Romania
*Corresponding author: marius.mihasan@uaic.ro

Members of the genus *Paenarthrobacter* have been reported in the literature as possessing interesting metabolic capabilities such as degrading xenobiotics. Thus, *Paenarthrobacters* are appealing for biotechnology development, especially in bioconversion and bioremediation. The complete sequencing and assembly of bacterial genomes in general and of this genus in particular is leading to a deeper understanding of the biology and evolution of these microorganisms. Among genetically variable bacterial species, a single strain rarely characterizes an entire species. Instead,

researchers are sequencing multiple strains of a species to compile the 'pan-genome' – the global genetic repertoire of a bacterial species. Pan-genome analysis identifies the conserved core genes, accessory genes and unique (strain-specific) genes of a species. However, assembling incompletely sequenced bacterial genomes is a major challenge in bioinformatics, as the sequences obtained can be fragmented and have gaps.

There are currently many *Paenarthrobacter* genomes available as drafts, i.e incompletely assembled genomes. The *Paenarthrobacter nicotinovorans* strain ATCC 49919 genome is one of the fully sequenced and assembled strains and was therefore selected as a reference for comparative analysis of the genomes studied in this work.

16 genomes (14 *Paenarthrobacter* and 2 *Rhodococcus* used as outgroup) were downloaded from GenBank and imported in Geneious and BPGA. Multiple alignment of the whole genomes was performed using the progressiveMauve algorithm. The algorithm identifies and aligns regions of local collinearity, based on which a phylogenetic tree was generated. BPGA (Bacterial Pan-Genome Analysis) was used for generating pan-genomic and core-genomic trees. Our results showed that *P. nicotinovorans* SSBW5, 26Cvi.1E and 231Sha2.1M6 strains are mislabeled in the database and do not belong to the same species. Also, we have shown that *Paenarthrobacter* sp. YJN-D is an ancestor of *P. nicotinovorans* ATCC 49919 and *P. nicotinovorans* Hce-1. The data is useful to clarify phylogenetic relationships and taxonomic reclassification of the strains studied.

ANTIBIOFILM ACTIVITY OF BRCL-FLAV AGAINST *CANDIDA KRUSEI*

Savu Mihaela[1,*], Mantea Loredana-Elena[1], Ciobanasu Corina[2], Birsa Lucian[3], Ștefan Marius[1]

[1]Faculty of Biology, Alexandru Ioan Cuza University of Iași, Iași, Romania
[2]Interdisciplinary Research Institute, Alexandru Ioan Cuza University of Iași, Iași, Romania
[3]Faculty of Chemistry, Alexandru Ioan Cuza University of Iași, Iași, Romania
*Corresponding author: mihaelasavu2@gmail.com

Due to increasing resistance to antifungal agents, fungal infection caused by *Candida* species is a major concern for the medical community worldwide. The resistance of *Candida* cells to some drugs such as fluconazole and amphotericin B is due to their ability to form biofilms, with the sessile cells being up to 2000 times more resistant than the planktonic cells. Therefore, the aim of the present study was to evaluate the activity of the synthetic flavonoid BrCl on the formation of biofilm by *Candida krusei*. In this context, the antibiofilm potential of BrCl-flav was estimated using the minimum biofilm inhibitory concentration (MBIC90). Crystal violet staining was used to assess in vitro biofilm formation at different stages (adhesion, preformation, formation, and maturation) in the presence of BrCl-flav. In addition, the effect of BrCl-flav on the architecture of the mature biofilm was also assessed using optical and confocal microscopy. Our data have shown that BrCl-flav has an important anti-*Candida* activity, with an MBIC90 value of 15.62 µg/ml. In the presence of BrCl-flav at subinhibitory concentrations, adhesion, preformation and biofilm formation were inhibited. The mature biofilm produced by *C. krusei* was also eradicated by BrCl-flav. Our results suggest that BrCl-flav has significant potential as a novel antibiofilm agent against *Candida* biofilm.

COMPARATIVE ANALYSIS OF PROTEINS FRACTIONS DURING THE GROWTH OF *PAENARTHROBACTER NICOTINOVORANS*

Mleșniță Andreea Mihaela[1], Petrila Daria-Bianca[1], Mihășan Marius[1,*]

[1]BioActive Research Group, Alexandru Ioan Cuza University of Iasi, Iasi, Romania
*Corresponding author: marius.mihasan@uaic.ro

Paenarthrobacter nicotinovorans is an interesting soil bacteria due to its ability to metabolize nicotine. Extensive work has been performed to characterize the strain, including the recent sequencing of its genome, transcriptomics, and proteomics analysis. The proteomics approach failed to identify any transcriptional factors and transmembrane proteins known to be expressed when nicotine is present. Most probably, sample harvesting and processing was not the best. The current work reports some preliminary data in an effort to re-think the whole proteomics approach and corelate it with the already existing data. *Paenarthrobacter nicotinovorans* ATCC 49919 was grown on various media (citrate with yeast extract, citrate with biotin, minimal medium with biotin) for 24 hours and 3 samples were taken at specific OD's: 0.25 - start of the log phase, 0.6 - middle of the log phase, >0.6 aiming for the end of log phase and at least 24 hours of growth for late stationary phase. Sample were lysed in the presence of SDS and β-mercapto-ethanol and loaded on a Maxi gradient gel. After separation, gels were stained with Comassie Brilliant Blue R-250. Gels were photographed and analyzed with BioRad Image Lab. Protein molecular weights and concentrations were extrapolated from calibration curves generated using ROTI Mark Standard Markers. A total of 30 samples containing cell lysates were separated by SDS-PAGE. Various differences in terms of presence of extra fractions were observed when nicotine was present in the medium, indicating that this approach could be integrated into a gel-based proteomics study.

NMDAR ACTIVATION AND CYTOTOXICITY INDUCED BY MICROMOLAR DOSES OF ASPARTAME IN A HETEROLOGOUS EXPRESSION SYSTEM

Shurooq Asaad Abdulameer Shaher[1,2,*]

[1]Dept. Biophysics and Physiology, Faculty of Biology, University of Bucharest, Romania
[2]Dept. Medical laboratories. Babylon Technical Institute, Alfurat Al Awsat Technical University, Iraq
*Corresponding author: drshuruq73@gmail.com

Aspartame, the methyl ester of the dipeptide formed by aspartic acid and phenylalanine, became during the last 40 years a very popular and widely used artificial sweetener, being incorporated in carbonated beverages, foods and also used as additive in many drugs for oral adminsitration. In spite of this widespread use, many studies, including epidemiology surveys and clinical trials, as well as in vivo and in vitro experiments, revealed a number of negative side effects, particularly at the central nervous system level, such as headaches, increased seizure susceptibility, headaches, altered mood, irritability, depression, altered spatial orientation and learning, sometimes occurring at doses below the maximum admissible daily intake (40 mg/kg day in Europe), deemed to result from competition between aspartame decomposition products phenylalanine and aspartate and other large neutral amino-acids for a common transporter across the blood-brain barrier resulting in decreased dopamine and serotonin levels, and also by aspartate-triggered

excitotoxicity. Therefore our study aimed to evidence direct activation by aspartame of N-methyl-D-aspartate receptors (NMDARs) induced by transfection of different cells with plasmids containing subunits NR1 and NR2b fused with enhanced green fluorescent protein (eGFP). Thus, via whole-cell patch-clamp experiments in HEK293T cells transfected by electroporation we recorded NMDAR outward current transients at +40 mV elicited by 200 ms pulses of aspartame or L-glutamate 100 µM, while in transfected CHO-K1 cells 2-4 h exposure to aspartame 10 µM to 10 mM induced increased apoptosis revealed by propidium iodide staining and flow cytometry.

STUDIUL EFECTELOR TRATAMENTULUI CU APĂ ACTIVATĂ CU PLASMĂ NONTERMICĂ LA PRESIUNE ATMOSFERICĂ ASUPRA PROCESELOR DE GERMINAȚIE ȘI DEZVOLTARE ALE SPECIEI *PHASEOLUS VULGARIS* L.

Leți Livia-Ioana[1,2], Topală Ionuț[3], Străjeru Silvia[2], Mihăilă Ilarion[3], Gerber Ioana Cristina[3], Galan Paula-Maria[1,2], Petrescu Denisa-Elena[1,2], Cîmpeanu Mirela Mihaela[1], Zamfirache Maria-Magdalena [1], Gorgan Dragoș-Lucian[1,*]

[1]Universitatea Alexandru Ioan Cuza Iași, Facultatea de Biologie, România
[2]Banca de Resurse Genetice Vegetale „Mihai Cristea” Suceava, România
[3]Universitatea Alexandru Ioan Cuza Iași, Facultatea de Fizică, România
*Autor corespondent: lucian.gorgan@uaic.ro

Tratamentul apei cu plasmă nontermică la presiune atmosferică duce la formarea apei activată de plasmă (Plasma Activated Water, prescurtată PAW) și suferă modificări chimice și fizice care produc diverse efecte biologice asupra semințelor.
Criteriul de selecție al probelor a fost capacitatea lor germinativă: proba SVGB-15517 (germinație 100%) și proba SVGB-18100 (germinație 70%). PAW a fost obținută prin metoda Dielectric Barrier Discharge, la presiune atmosferică, timp de 5 minute. Au fost realizate 4 variante experimentale: UW – exclusiv apă netratată (untreated water, UW); KNO_3 + UW – pulverizare cu KNO_3 0,2%, apoi doar UW; PAW + UW –5 zile PAW, ulterior UW; PAW – exclusiv PAW.
Probele au fost puse la germinat la temperatura de 22°C, umiditate 75%, timp de 8 zile, iar apoi au fost plantate în pământ pentru încă 14 zile. Pe parcursul acestei perioade a fost evaluat procesul germinativ, procesele ulterioare de creștere, cantitatea de pigmenți asimilatori și evaluarea prin qRT-PCR a expresiei unor gene implicate în dezvoltarea plantei (PP2C, P5CS10, LEA) și în sinteza de clorofilă (POR2).
Principalele rezultate indică, în cazul probei SVGB-15517, tratamentul cu KNO_3 sau PAW a determinat creșterea vitezei germinației și a lungimii radicului și a plantei, cât și creșterea semnificativă a expresiei genelor PP2C, P5CS10 și LEA în condițiile de tratament. Se observă și creșterea cantității de clorofilă A în urma tratamentului cu PAW, susținută și prin creșterea expresiei genei POR2. Pentru proba SGVB-18100 se observă creșterea numărului de semințe germinate, asociată cu stimularea expresiei genei P5CS10.
În concluzie, pentru proba SVGB-15517 se înregistrează o scădere a timpului necesar germinației, stimularea parametrilor morfologici ai plantei și o creștere a cantității de pigmenți asimilatori, toate aceste rezultate fiind susținute de rezultatele moleculare. În cazul probei SVGB-18100, metodele de tratament indică o stimulare a numărului de semințe germinate.

IDENTIFICAREA VARIANTELOR GENETICE DE PHASEOLUS VULGARIS CU RĂSPUNS POZITIV LA FACTORII DE STRES HIDRIC ÎN CONTEXTUL ÎNCĂLZIRII GLOBALE

Galan Paula-Maria[1,2], Străjeru Silvia[2], Leți Livia-Ioana[1,2], Ivănescu Lăcrămioara-Carmen[1], Zamfirache Maria-Magdalena[1], Cîmpeanu Mirela-Mihaela[1], Petrescu Denisa-Elena[1,2], Gorgan Dragoș-Lucian[1,*]

[1]Universitatea „Alexandru Ioan Cuza” Iași, Facultatea de Biologie, România
[2]Banca de Resurse Genetice Vegetale „Mihai Cristea” Suceava, România
*Autor corespondent: lucian.gorgan@uaic.ro

FAO plasează specia Phaseolus vulgaris pe primul loc, ca importanță între leguminoase, la nivel mondial. Factorii de stres abiotic pot duce la scăderea randamentului producției, cu efecte severe, în special, în țările sărace ale lumii.
Pentru testarea toleranței speciei Phaseolus vulgaris, la secetă, au fost realizate studii multidisciplinare, precum cele la nivel molecular, prin evaluarea expresiei unor gene implicate în creștere și dezvoltare (PP2C, P5CS. ABA8H), respectiv în răspunsul plantei la factorii de stres hidric (LEA3, WRKY 53, WRKY 57), dar și la nivel biochimic (concentrația pigmenților asimilatori). Materialul biologic utilizat este reprezentat de 3 varietăți de Phaseolus vulgaris. Două dintre acestea sunt populații locale SVGB-2087 și SVGB-1988, iar cea de-a treia este o varietate cu rezistență crescută la secetă (Lechința). Fiecare probă a fost reprezentată de 2 loturi martor (irigare 30 și 34 zile) și 2 loturi experimentale supuse stresului hidric (22 zile irigare și 8/12 zile stres hidric).
Au fost raportate următoarele rezultate: în cazul probei SVGB-1988 au fost înregistrate cele mai mici valori ale expresiei genelor de interes, astfel, varietatea este slab rezistentă la condițiile secetă. Cuantificarea expresiei genelor de interes, în cazul varietății Lechința, demostrează că, aceasta este cea mai rezistentă la perioadele lungi de secetă (12 zile de sectă), iar varietatea SVGB-2087 mai rezistentă la perioadele scurte de stres hidric (8 zile). Cuantificarea spectofotometrică a pigmenților asimilatori confirmă faptul că, varietatea Lechința este cea mai rezistentă la secetă, urmată de SVGB-1988, iar varietatea SVGB-2087 este cea mai slab rezistentă.
Varietatea Lechința este cea mai rezistentă față de lipsa apei, reprezentând un material de bază pentru programele de amelioare. Proba SVGB-1988 a raportat cele mai scăzute valori ale parametrilor analizați prezentând o rezistență scăzută la secetă. Proba SVGB-2087 este intermediară, celor două, ca rezistență la stresul hidric.

CYTOPHYSIOLOGICAL INDICATORS FOR DETERMINATION OF THE SODIUM NITRITE (E250) EFFECT ON SOME CELL LINES WITH HUMAN AND ANIMAL ORIGIN

Mihai Cosmin-Teodor[1,2], Vochita Gabriela[1,*], Gherghel Daniela[1]

[1]Department of Experimental and Applied Biology, Institute of Biological Research Iasi, 47 Lascar Catargi Str., 700107 Iasi, Romania
[2]Praxis Medical Investigations, 700505 Iasi, Romania
*Corresponding author: gabrielacapraru@yahoo.com

The effect of sodium nitrite (E250) on cell viability (MTT assay), cell morphology (light microscopy), survival and cell proliferation (Clonogenic assay) was investigated using MCF-12A (ATCC® CRL-10782) human mammary gland epithelial cells and Vero (ATCC® CCL-81) kidney cells from the African monkey Cercopithecus aethiops.

To determine cell viability, the concentrations of 12.5; 25; 50 and 100 µg/mL sodium nitrite were used, during 24 and 48 hours, to capture the optimal moment of the additive's action.

The cells response varied both with the time of exposure to the additive, the concentration used and with the tested cell line. Thus, after 24 hours of treatment, the sensitivity of Vero cells was more accentuated, recording viability values of 85.58% at 12.5 µg/mL, respectively a viability of 76.36% in the case of the application of 100 µg/mL sodium nitrite. The viability of MCF-12A cells at the same treatment interval was between 95.05% (12.5 µg/mL) and 85.45% (100 µg /mL). Instead, prolonging the treatment for 48 hours resulted in a more intense reduction of MCF-12A cells viability, ranging from 79.98% (12.5 µg/mL) to 57.78% (100 µg/mL), and Vero cells showed a viability of 88.00% (12.5 µg/mL), respectively 66.46% (100 µg/mL). These results denote the delayed onset of the cytotoxic phenomenon in the human cells, compared to monkey, which may be correlated with the different rate of cell division (18 hours for Vero and 35.42 hours for MCF-12A cells).

Regarding the cell morphology, the changes induced by sodium nitrite treatment were generally represented by loss of substrate adhesion and difficulties in the monolayer formation leading to the accumulation of death floating cells in the culture medium.

Colony formation capacity decreased proportionally with the increase of the additive concentration, the response pattern being similar for both cell lines.

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RESURSE EDUCAȚIONALE ÎN BIOLOGIE

SECȚIA: GENERAL 3

COMUNICĂRI ORALE

MUSEUM OF NATURAL HISTORY: PRESENT AND PERSPECTIVES

Davideanu Ana[1,*], Davideanu Grigore[1]

[1]Muzeul de Istorie Naturală, Universitatea ”Alexandru Ioan Cuza” din Iași, România
*Corresponding author: anamuzeu@yahoo.com

Stepping toward the 190 jubilee since it’s foundation in 1834, The Natural History Museum presents itself as an institution that need to retrace his own value as part of the ”Alexandru Ioan Cuza” University. It need to re-evaluate its objectives and contribution it has as part of the University and renew of it’s image and role toward the local an regional community.
The paper presents a short history of the Natural History Museum in Iasi, it’s evolution, the present status of the institution. We made a SWAT analysis, propose some changes of the museum status, and bring in front some ideas to be debated for the design of the future permanent exhibition.
If at its beginnings the main objective was „presentation of the land and underground treasures of Moldavia, and curiosities from abroad” nowadays it need to be focused both on preserving its scientific, cultural and historical heritage in his depositories and educating the public toward the natural assets conservation.

IPOSTAZE ALE ÎNVĂȚĂRII DE PERFORMANȚĂ LA BIOLOGIE: REZULTATE ALE OLIMPIADELOR ȘI CONCURSURILOR ȘCOLARE DIN JUDEȚUL IAȘI, ÎN ANUL 2023

Caradan Lorela-Anda[1], Bohotineanu Ioana[2], Sardariu Oana[3], Condrea Marieta[4], Costică Naela[5,*]

[1]Inspectoratul Școlar Iași/Colegiul Național “Emil Racoviță” Iași, România
[2]Colegiul Național Iași, România
[3]Colegiul Național “Mihai Eminescu” Iași, România
[4]Colegiul Național “Vasile Alecsandri” Iași, România
[5]Universitatea “Alexandru Ioan Cuza” din Iași, Facultatea de Biologie, România
*Autor corespondent: cnaela@uaic.ro

Biologia ca disciplină de studiu în învățământul preuniversitar este abordată cu interes de către elevi, atât pentru semnificația cunoașterii teoretice cât, mai ales, pentru cea practic – aplicativă. În același timp, biologia ocupă o poziție centrală printre științe atunci când este vorba de interesul elevilor pentru admiterea în învățământul superior medical, farmaceutic, biochimic, ecologic, agricol sau legat de asistența medicală. În acest context, se înregistrează numeroase participări de succes ale elevilor la olimpiade și concursuri școlare. Dacă fazele locale și județene ale acestor

competiții au un caracter mai mult sau mai puțin de masă, fazele lor naționale sunt un prilej de manifestare a performanței ridicate în studiul biologiei, performanță deschizătoare de drumuri către învățământul superior.
Ca urmare, în lucrarea de față sunt redate performanțele învățământului biologic din județul Iași, în anul 2023, la olimpiade și concursuri școlare de nivel național, cum ar fi: Olimpiada Națională de Biologie, Olimpiada Națională de Științe pentru Juniori, Olimpiada Națională de Științele Pământului, Olimpiada Națională de Creativitate, Concursul Național “George Emil Palade”, Concursul Național de Proiecte de Mediu, Concursul Național de Comunicări Științifice pentru elevii de liceu și Concursul sanitarii pricepuți. Câțiva dintre factorii care determină aceste performanțe sunt: în primul rând, percepția pozitivă a elevilor despre biologie, ca disciplină de studiu; apoi, gradul de determinare și implicare al profesorilor de biologie și nu, în ultimul rând, nivelul de educație și de implicare al părinților. Un alt factor determinant al succesului în învățarea biologiei este disponibilitatea laboratoarelor de biologie bine echipate, la care se adaugă facilitățile pentru explorările în teren, specifice biologiei. Autorii acestei lucrări intenționează să prezinte propria “rețetă a succesului” în obținerea de performanțe, prin tipurile de situații de învățare generate și metodele predominant utilizate în pregătirea elevilor pentru olimpiade și concursuri școlare.

THE RELATIONSHIP BETWEEN ARTISTIC EDUCATION, WELL - BEING, AND ACADEMIC PERFORMANCE IN HIGH SCHOOL STUDENTS

Băra Csilla Iuliana[1,*]

[1] Biology Teaching Master Program, Faculty of Psychology and Educational Sciences, Alexandru Ioan Cuza University, Iași, Romania
* Corresponding author: csillaiulianabara@gmail.com

The study aims to carry out a comparative analysis of the relationship between artistic education, well-being, and academic performance within two groups of high school students: the first group consists of 100 students from the “Octav Băncilă” Art College, Iași (vocational education) and a second group, made up of 100 students from the “Dimitrie Cantemir” Theoretical High School, Iași. An attempt is made to observe a connection between artistic education and academic performance quantified based on school results, well-being, and openness to experiences. The tool used is a psychological test containing items adapted from the Academic Motivation Scale, in the field of Educational Psychology, and the Openness to Experiences Scale, in the Personality field [IPIP]. The relationship between artistic education, well-being, and academic performance is multifaceted and potentially bidirectional. It can be asserted that there is a correlation between school results and art, in the sense that beyond its potential effects on well-being, the skills acquired through artistic education (such as discipline, persistence, and creativity) might directly influence the students’ academic achievements. Previous research has shown that participation in artistic activities may enhance cognitive abilities, improve memory and concentration, and boost critical thinking and problem-solving skills. Additionally, it can provide an emotional channel, allowing students to express themselves, which can potentially enhance their emotional well-being.

ACADEMIC SUCCESS IN THE “SCHOOL WITHOUT WALLS”

Măria Raluca[1], Băra Csilla Iuliana[1,*]

[1]Biology Teaching Master Program, Faculty of Psychology and Educational Sciences,
"Alexandru Ioan Cuza" University, Iași, Romania
*Corresponding author: csillaiulianabara@gmail.com

The present study is based on performing a comparative analysis of academic success (quantified based on the average graduation score of the Bachelor's cycle) in a group of 105 master's students who have/have not benefited from Erasmus+ Mobilities. An attempt was made to observe a connection between academic results, academic motivation, and openness to experiences. The instrument used was a psychological test containing items adapted from the Scale for Academic Motivation, from the field of Educational Psychology, and the Scale for Openness to Experiences, from the Personality domain [IPIP]. As a result of the study, it can be said that in the investigated group there is a positive correlation between academic results and the master's students openness to experiences and participation in the Erasmus+ program, meaning that students who benefited from Mobilities only had good and very good learning outcomes during the Bachelor's cycle, and a clear openness to new experiences compared to those who did not benefit. However, due to the small number of participants, the obtained results do not have statistical significance and we cannot consider the hypotheses confirmed.

ÎNVĂȚAREA BAZATĂ PE INVESTIGAȚIE ÎN PREDAREA BIOLOGIEI LA GIMNAZIU

Melniciuc Ioana Mădălina[1,2,*], Costică Naela[3], Ghiațău Roxana-Maria[2]

[1]Școala Gimnazială “Nicolae Iorga” Buhalnița- Iași, Universitatea ”Alexandru Ioan Cuza” din Iași, România
[2]Universitatea “Alexandru Ioan Cuza” din Iași, Facultatea de Psihologie și Științe ale Educației, România
[3]Universitatea “Alexandru Ioan Cuza” din Iași, Facultatea de Biologie, România
*Autor corespondent: ioana_madalina001@yahoo.com

Învățarea bazată pe investigație este un concept inovator și captivant pentru procesul educațional contemporan, deschizând perspective către o nouă paradigmă a învățării. În epoca modernă, caracterizată de complexitate și schimbare rapidă, învățarea prin investigație devine o modalitate de a pregăti elevii pentru provocările viitorului. În contrast cu metodele tradiționale, în care învățarea este în mai mare măsură pasivă, investigația pune în centrul procesului educațional explorarea activă, descoperirea și construirea cunoașterii. Investigația nu este doar o metodă de predare, ci o abordare holistică prin care se dezvoltă abilități de gândire critică, rezolvare de probleme și colaborare. Ea invită elevii să devină cercetători ai propriei învățări, să își pună întrebări, să descopere și să-și construiască un anumit nivel de înțelegerea asupra subiectului investigat. În acest context, profesorii devin ghizi și facilitatori, oferind îndrumare și susținere, lăsând elevilor spațiu pentru curiozitate și explorare creativă.

În acest context, lucrarea de față își propune să exploreze, din punct de vedere teoretic, conceptul de învățare bazată pe investigație, precum și modul de aplicare a acestuia la nivel de gimnaziu, pentru disciplina biologie. Astfel, lucrarea va oferi o privire critică asupra modului în care învățarea bazată pe investigație poate îmbunătăți procesul educational la nivel de gimnaziu și poate pregăti elevii pentru o înțelegere mai profundă a științelor biologice. Din perspectivă practică, vor fi analizate cinci, dintre cele mai utilizate manuale de biologie de clasa a VI -a, pentru a evalua modul în care această metodă este prezentă și implementată în sistemul de învățământ românesc. În urma analizei manualelor, se intenționează ca autorul acestui studiu să formuleze recomandări pentru profesori și editori de manuale, în vederea creării unui mediu educațional captivant și interactiv, din perspectiva învățării bazate pe investigație.

USING THE MODELING METHOD IN TEACHING BIOLOGY IN MIDDLE SCHOOL

Măria Raluca[1,*]

[1] Biology Teaching Master Program, Faculty of Psychology and Educational Sciences, Alexandru Ioan Cuza University of Iași, Romania
* Corresponding author ralucam238@gmail.com

The present study aims to investigate the importance of using the modeling method in biology learning. It includes a sample of 100 middle school students and 20 teaching staff who teach biology at the middle school level. The study seeks a comparison between the use of this method in the biology learning process by teachers and the impact felt by students when new concepts are based on this method. Modeling involves creating and using visual, interactive, or digital representations that allow students to visualize and experiment with biological phenomena in a more concrete way. Its goal is to make biology teaching more accessible and attractive to students, contributing to the development of their critical thinking and problem-solving skills. Through modeling, students can explore and understand complex concepts in biology, such as cell structure, physiological processes, or relationships in ecosystems. This approach promotes active student engagement in learning and provides them an opportunity to apply biological knowledge in practical contexts.

DIFICULTĂȚI ÎN REALIZAREA ALFABETIZĂRII ȘTIINȚIFICE LA BIOLOGIE: STUDIU DE CAZ PENTRU CÂTEVA UNITĂȚI DE ÎNVĂȚĂMÂNT PREUNIVERSITAR DIN ROMÂNIA

Cantoreanu (căs. Damian) Oana[1,2,*]

[1] Profesor la Școala Gimnazială nr.1, sat Gara Banca, jud. Vaslui, România
[2] Universitatea Alexandru Ioan Cuza din Iași, Facultatea de Psihologie și Științe ale Educației (Masterat didactic în Biologie), România
* Autor corespondent: prof.oanadamian@yahoo.com

Alfabetizarea disciplinară (Shanahan & Shanahan, 2008), respectiv alfabetizarea în biologie, care se referă la capacitatea de citire și scriere specifică disciplinei, contribuie la edificarea alfabetizării

științifice în general, necesară educabilului – viitor adult integrat în societatea modernă bazată pe cunoaștere. Analiza rezultatelor obținute de elevii români la testările naționale și internaționale de tip PISA, cât și concluziile numeroaselor studii și cercetări dedicate alfabetizării științifice sunt menite să atragă atenția asupra necesității unor măsuri ameliorative în cazul acestui tip de alfabetizare în România.
Pornind de la aceste premise, în lucrarea de față ne propunem să înțelegem dificultățile de citire, înțelegere și scriere a textelor de biologie de către elevi (Fang, 2005; Lemke, 1990; Wellington & Osborne, 2001), precum și dificultățile pe care cadrele didactice le întâmpină în realizarea alfabetizării științifice în biologie (Ariely & Yarden, 2018; Osborne, 2014).
Pe baza informațiilor selectate din literatura de specialitate, se va elabora un chestionar care va avea ca scop identificarea dificultăților pe care le întâmpină profesorii de biologie, din câteva unități de învățământ preuniversitar din România, în practicile curente de predare care vizează alfabetizarea disciplinară. Pe baza rezultatelor obținute prin aplicarea chestionarului intenționat, pe un grup țintă reprezentativ, se vor propune și supune atenției câteva modalități de îmbunătățire a acestui tip de predare în școli din România.

RELAȚIA DINTRE COMPETENȚELE MENTORULUI ȘI OBIECTIVELE DE FORMARE ALE STUDENȚILOR PRACTICANȚI PE DURATA PRACTICII PEDAGOGICE LA BIOLOGIE

Horaicu Cosmin-Dumitru[1,2*], Perju Felicia-Mura[2]

[1] Universitatea “Alexandru Ioan Cuza” din Iași, Facultatea de Biologie, România
[2]Colegiul Național „Garabet Ibrăileanu” din Iași, România
*Autor corespondent: cosmin_horaicu@yahoo.com

Organizarea practicii pedagogice a studenților, în acord cu nevoile de pregătire inițială pentru cariera didactică, se realizează în conformitate cu planurile de învățământ ale noului curriculum și a reorganizării instituționale, asigurându-se calitatea acestora la nivelul standardelor educaționale, în spiritul modernizării procesului de învățământ.
În cadrul acestui studiu, trecem în revistă câteva competențe profesionale specifice profesorului mentor, precum competențe metodologice, de comunicare și relaționare, de evaluare, psihosociale, tehnologice, sau de management al carierei. Aceste competențe au fost puse în practică în activitatea cu studenții având scopul atingerii diverselor obiective de formare ale acestora, precum explicarea contextualizării metodelor de predare-învățare, a formelor de organizare a activităților didactice, a utilizării mijloacelor de învățământ în predarea-învățarea biologiei, a algoritmului proiectării didactice la biologie care vizează macroproiectarea, microproiectarea, modele de structurare a lecției, și evaluarea procesului de învățare, a propriei activități, a manualelor, proiectelor de activitate didactică, a mijloacelor de învățământ și a efectelor activităților de cunoaștere a elevilor.
Totodată, în această lucrare sunt propuse câteva standarde privind integrarea în programul unității școlare, activitățile didactice la care studentul este coparticipant, relațiile cu elevii și cu corpul profesoral, adoptarea unor atitudini responsabile față de profesiunea didactică sau privind produsele de învățare realizate, care duc la dezvoltarea de competențe și la îndeplinirea obiectivelor de formare.

Prin această lucrare, subliniem de asemenea faptul că un mentor reprezintă un real sprijin pentru studenții practicanți, inducând un climat de voință, în care toți participanții „merg” într-o direcție constructivă și formativă, iar astfel ,,mecanismul” mentor-student-elev funcționează eficient.

ETHICAL DIMENSIONS IN TEACHING BIOTECHNOLOGY TO HIGH SCHOOL STUDENTS

Balan Anca-Andreea[1,*]

[1] Biology Teaching Master Program, Faculty of Psychology and Educational Sciences, Alexandru Ioan Cuza University, Iași, Romania
* Corresponding author: ancaabb@yahoo.ro

This study aims to analyze students' attitudes towards complex socio-scientific issues involving biotechnology, as well as teaching techniques that can be used in the teaching-learning process of high school students on different topics in biotechnology, as they involve ethical issues, which are difficult to be addressed by biology teachers. Biotechnology involves interdisciplinary issues, which are progressing rapidly and require new teaching approaches. The participants of this study are high school students from the "Eremia Grigorescu" Technological High School in Tg. Bujor, Galati county, as they will soon become legal adults. This prompts them to make moral decisions that may affect their health or well-being. However, tackling and solving biotechnology-related problems requires specialised knowledge, which high school students should have. The research instrument used in this study consists of a questionnaire comprising multiple-choice and fill-in items. Therefore, biotechnology is an important subject for high school students as it brings up current issues, but further research is needed to be done to identify ways to teach it effectively without stirring controversy among students.

CURRENT APPROACHES TO SEX EDUCATION IN SECONDARY EDUCATION

Daraban (Dîrdală) Mihaela[1,*]

[1] Biology Teaching Master Program, Faculty of Psychology and Educational Sciences, Alexandru Ioan Cuza University, Iași, Romania
* Corresponding author: miha_daraban@yahoo.com

Traditionally, sex education has focused on the potential risks of sexuality, such as unplanned pregnancy and STIs. For children and young people, these negative aspects are often frightening: in addition, traditional sex education does not respond to their need for information and skills, and in most cases, these are simply not relevant to them.
The holistic approach based on understanding sexuality as an area of human potential helps children and young people build essential skills to determine their sexuality and relationships at different stages of development. This approach helps them become more informed and thus live their sexuality and partnerships in a fulfilling and responsible manner.
The study will include a questionnaire addressed to biology teachers in Iași County to document the extent to which sex education is carried out in school and a focus group interview with biology

teachers to address the themes and methods of optimizing sex education in schools. Focus - the group as a data collection method, through the positive dynamic interaction between group members, increases the richness of the collected data and optimizes the process of sexual education among students. In order to analyze the collected data, inductive thematic analysis will be used, to closely examine the collected answers and identify the themes and methods of optimizing sex education in the schools of Iași County.

INDEXUL AUTORILOR

ABALAȘEI Marinela – Faculty of Biology, University „Alexandru Ioan Cuza” of Iași, Iași, Romania; manumary313@gmail.com
ACATRINEI Ligia – NIRDBS, Institute of Biological Research, Iași, Romania; acatrineil@yahoo.com
ALISTAR (PELCARU) Cristina Florentina – Department of Biochemistry and Molecular Biology, Faculty of Biology, University of Bucharest, Bucharest, Romania; cristinapelcaru@yahoo.com
APROTOSOAIE Ana Clara – Department of Pharmacognosy, Faculty of Pharmacy, University of Medicine and Pharmacy “Grigore T. Popa” Iasi, Romania
ASĂNDULESEI Andrei – Centrul Arheoinvest, Departamentul Științe Exacte și Științe ale Naturii, Institutul de Cercetări Interdisciplinare, Universitatea „Alexandru Ioan Cuza” din Iași, România; andrei.asandulesei@yahoo.com
ATODIRESEI Mălina – Facultatea de Biologie, Universitatea "Alexandru Ioan Cuza" din Iași, Iași, România, malina_atodiresei@yahoo.com
BALAN Anca-Andreea – Biology Teaching Master Program, Faculty of Psychology and Educational Sciences, Alexandru Ioan Cuza University, Iași, Romania; ancaabb@yahoo.ro
BĂLĂȘESCU Adrian – Institutul de Arheologie București, Academia Română, Romania; abalasescu2005@yahoo.fr
BĂRA Csilla Iuliana – Biology Teaching Master Program, Faculty of Psychology and Educational Sciences, Alexandru Ioan Cuza University, Iași, Romania; csillaiulianabara@gmail.com
BARBU Lucian – “Babeș-Bolyai” University of Cluj-Napoca, Faculty of Biology and Geology, Romania; lucian.barbu@ubbcluj.ro
BAȚ Mihail – Facultatea de Istorie și Filosofie, Universitatea de Stat din Moldova, Chișinău, Republica Moldova; mb_usm@yahoo.com
BEJENARU Luminița – Faculty of Biology, Alexandru Ioan Cuza University of Iași, Romania; Romanian Academy – Iaşi Branch, “Olga Necrasov” Centre for Anthropological Research, Iași, Romania; lumib@uaic.ro
BENSLAMA Mohamed – Badji Mokhtar-Annaba University P.O Box.12, Annaba-23000 Algeria; bensamrane@yahoo.fr
BERZOVAN Alexandru – Institute of Archaeology, Iași, Romania; berzovanalexandru@gmail.com
BILAVSCHI George – Faculty of Biology, Alexandru Ioan Cuza University of Iași, Iași, Romania; Romanian Academy – Iași Branch, Institute of Archaeology, Iași, Romania; bilaskus@gmail.com
BÎRSĂ Lucian Mihail – Faculty of Chemistry, Alexandru Ioan Cuza University of Iasi, România; lbirsa@uaic.ro
BOHOTINEANU Ioana – Colegiul Național Iași, România
BORCĂ Mădălina – Faculty of Biology, Alexandru Ioan Cuza University of Iași, Romania; madalinaborca@gmail.com
BOZ Irina – Faculty of Medicine and Biological Sciences, Stefan cel Mare University of Suceava, Romania; NIRDBS – Institute of Biological Research, Iași, Romania; boz_irina@yahoo.com
BRAȘOVEANU Casandra – Centrul Arheoinvest, Departamentul Științe Exacte și Științe ale Naturii, Institutul de Cercetări Interdisciplinare, Universitatea „Alexandru Ioan Cuza” din Iași, România; brasoveanu.casandra@yahoo.com
BRUNCHI Radu-Alexandru – Centrul Arheoinvest, Departamentul Științe Exacte și Științe ale Naturii, Institutul de Cercetări Interdisciplinare, Universitatea „Alexandru Ioan Cuza” din Iași, România; radu.brunchi@uaic.ro

BUCHETE Nicolae-Viorel – University College Dublin, National University of Ireland, Dublin, Irland, buchete@gmail.com
BUTISEACĂ Geanina-Adriana – Eberhard Karls Universität Tübingen, Department of Geosciences, Institute of Archaeological Sciences, Paleoanthropology Department, Tübingen, Germany; Senckenberg Biodiversity and Climate Research Centre (BiK-F), Frankfurt am Main, Germany; butiseacageanina.@gmail.com; geanina-adriana.butiseaca@ifu.uni-tuebingen.de
CABA Florina Georgiana – Facultatea de Biologie, Universitatea Alexandru Ioan Cuza din Iași, Iași, România, florinag_caba@yahoo.ro
CĂLUGĂR Adina – Institutul de Cercetări Biologice Iași, România; adina.calugar@icbiasi.ro
CANTOREANU (căs. Damian) Oana – Profesor la Școala Gimnazială nr. 1, sat Gara Banca, jud. Vaslui, România; Universitatea „Alexandru Ioan Cuza” din Iași, Facultatea de Psihologie și Științe ale Educației (Masterat didactic în Biologie), România**;** prof.oanadamian@yahoo.com
CARADAN Lorela-Anda – Inspectoratul Școlar Iași/Colegiul Național „Emil Racoviță” Iași, România; lorela_k@yahoo.com
CAROZZA Jean-Michel – Department of Human and Social Sciences, La Rochelle University, LIENSs CNRS-UMR 7266, 17000 La Rochelle, France; jean-michel.carozza@univ-lr.fr
CAROZZA Laurent – UMR 5602 GEODE, Université Toulouse-le-Mirail, Maison de la Recherche, Toulouse Cedex 1, France; laurent.carozza@cnrs.fr
CÎMPEANU Mirela Mihaela – Universitatea „Alexandru Ioan Cuza” Iași, Facultatea de Biologie, România; mirela.cimpeanu@gmail.com
CIOBANASU Corina – Interdisciplinary Research Institute, Alexandru Ioan Cuza University of Iași, Iași, Romania
CIOCAN Ramona Mariana – Facultatea de Biologie, Universitatea Alexandru Ioan Cuza din Iași, Iași, România; ramonabiologie54@gmail.com
CIORPAC-PETRARU Ozana-Maria – Centrul de Cercetări Antropologice „Olga Necrasov”, Academia Română Filiala Iași, România; Facultatea de Biologie, Universitatea „Alexandru Ioan Cuza” din Iași, Iași, România; ozanapetraru@gmail.com
CONDREA Marieta – C âolegiul Național „Vasile Alecsandri” Iași, România
COSTICĂ Naela – Facultatea de Biologie, Universitatea „Alexandru Ioan Cuza” din Iași, Iași, România; cnaela@uaic.ro
CREȚU Eliza-Ioana – Alexandru Ioan Cuza University of Iași, Faculty of Biology, Bd. Carol 20A, 700505, Iași, Romania; cretuelizaioana99@yahoo.com
CRETU Ruxandra – “Stejarul” Biological Research Centre, Alexandru cel Bun 6, Piatra Neamt, NIRDBS Bucharest, Romania
CRISTEA Alexandra – F acultatea de Biologie și Geoștiințe, Universitatea de Stat din Moldova, Chișinău, Republica Moldova; cristeaalexandra111@gmail.com
CURLIȘCĂ Angelica – Complexul Muzeal de Științe ale Naturii Constanța, România, curlisca.angelica@gmail.com
DANU Mihaela – Facultatea de Biologie, Universitatea „Alexandru Ioan Cuza” din Iași, Iași, România**;** Facultatea de Drept, Universitatea „Alexandru Ioan Cuza” din Iași, Iași, România**;** mihaela.danu@uaic.ro
DARABAN (DÎRDALĂ) Mihaela – Biology Teaching Master Program, Faculty of Psychology and Educational Sciences, Alexandru Ioan Cuza University, Iași, Romania; miha_daraban@yahoo.com
DASCALU Maria-Magdalena – CERNESIM, Institutul de Cercetări Interdisciplinare, Universitatea „Alexandru Ioan Cuza” din Iași, România
DAVIDEANU Ana – Muzeul de Istorie Naturală, Universitatea „Alexandru Ioan Cuza” din Iași, România; anamuzeu@yahoo.com

DAVIDEANU Grigore – Muzeul de Istorie Naturală, Universitatea „Alexandru Ioan Cuza” din Iași, România; grigore@uaic.ro
DÉNES Avar-Lehel – Institute of Interdisciplinary Research in Bio-Nano-Sciences, Babeș-Bolyai University, Treboniu Laurian 42, 400271, Cluj-Napoca, Romania; avar.lehel@gmail.com
DIACONU Vasile – Târgu Neamţ History and Etnography Museum, Department of Archaeology, Târgu Neamţ, Romania; diavas_n82@yahoo.com
DONCIU Paul-Iulian – Alexandru Ioan Cuza University of Iași, Faculty of Biology, Bd. Carol 20A, 700505, Iași, Romania; donciu_p@yahoo.com
DUMITRASCU Mirela – MIB TH laboratory, Iasi, Romania; dumitrascumirela1969@gmail.com
EL-SABEH Amada – BioActive Research Group, Department of Biochemistry and Molecular Biology, Alexandru Ioan Cuza University, Iasi, Romania; amadaelsabeh@gmail.com
ENE Ionela-Mihaela – Faculty of Biology, Alexandru Ioan Cuza University of Iasi, Romania; eneionelamihaela@yahoo.com
ENEA Sergiu-Constantin – "Ion Neculce" High School, Târgu Frumos, Romania; eneasergiu2014@yahoo.com
FEDOR Catalin-George – Academia Romana, Filiala Iași, Centrul de Cercetari Antropologice „Olga Necrasov”, România; cgfedor@yahoo.com
FRUNZETE Mădălina Elena – Facultatea de Biologie, Universitatea „Alexandru Ioan Cuza” din Iași, Iași, România; f.madalinaelena@yahoo.com
FUSU Lucian – Grupul de Cercetare în Diversitatea și Filogenia Nevertebratelor, Facultatea de Biologie, Universitatea „Alexandru Ioan Cuza” din Iași, România; lucian.fusu@uaic.ro
GALAN Paula-Maria – Universitatea „Alexandru Ioan Cuza” Iași, Facultatea de Biologie, România; Banca de Resurse Genetice Vegetale „Mihai Cristea” Suceava, România; greculeacpaula@yahoo.com
GAVRIL Viorel Dumitru – Department of Biochemistry and Molecular Biology, Faculty of Biology, University of Bucharest, Bucharest, Romania; Institute of Biology Bucharest, Romanian Academy, Bucharest, Romania, University of Bucharest, Bucharest, Romania; viorel.gavril26@gmail.com
GEORGESCU Ovidiu Andrei – Facultatea de Biologie, Universitatea „Alexandru Ioan Cuza” Iași, Iași, România; andrei.gg.2002@gmail.com
GERBER Ioana Cristina – Universitatea „Alexandru Ioan Cuza” Iași, Facultatea de Fizică, România
GHERGHEL Daniela – Department of Experimental and Applied Biology, Institute of Biological Research Iasi, 47 Lascar Catargi Str., 700107 Iasi, Romania; daniela_gherghel@yahoo.com
GHERGHEL Iulian – Department of Exact and Natural Sciences, Alexandru Ioan Cuza University of Iași, Romania; Faculty of Natural and Agricultural Sciences, Ovidius University of Constanța, Romania; iuliangherghel@gmail.com
GHIAȚĂU Roxana-Maria – Universitatea „Alexandru Ioan Cuza” din Iași, Facultatea de Psihologie și Științe ale Educației, România
GHIRVU Bogdan-Ioan – BioActive Research group, Biology Department, Alexandru Ioan Cuza University of Iasi, Iasi, Romania; bogdan.ghirvu@gmail.com
GORGAN Lucian Dragoș – Alexandru Ioan Cuza University of Iaşi, Faculty of Biology, Iași, Romania; lucian.gorgan@uaic.ro
GOSTIN Irina Neta – Faculty of Biology, Alexandru Ioan Cuza University of Iași, Romania; irinagostin@yahoo.com
GRIGORAS Valentin – “Stejarul” Biological Research Centre, Alexandru cel Bun 6, Piatra Neamt, NIRDBS Bucharest, Romania; valygrigoras@yahoo.com

GROZA Vasilica-Monica – Centrul de Cercetări Antropologice „Olga Necrasov”, Academia Română Filiala Iași, România; Facultatea de Biologie, Universitatea „Alexandru Ioan Cuza” din Iași, Iași, România; moni_ian@yahoo.com
HANCEANU Lucian – Facultatea de Biologie, Universitatea „Alexandru Ioan Cuza” din Iași, Iași, România; hanceanu.lucian@yahoo.com
HORAICU Cosmin-Dumitru – Universitatea „Alexandru Ioan Cuza” din Iași, Facultatea de Biologie, România; Colegiul Național „Garabet Ibrăileanu” din Iași, România; cosmin_horaicu@yahoo.com
HRIBAN Cătălin – Institutul de Arheologie, Academia Română Filiala Iași, România; catalin.hriban@gmail.com
ILIE Maria – Horia Hulubei National Institute for Physics and Nuclear Engineering Research, RoAMS, București-Măgurele, Ilfov, Romania
ILIOAIA Cristian – Institute for Integrative Biology of the Cell, Gif-sur-Yvette, France; cristian.ilioaia@cea.fr
IORGA Ionuț-Alexandru – Faculty of Biology, Alexandru Ioan Cuza University of Iași, Romania; ionutiorga65@gmail.com
IORGU Elena Iulia – Facultatea de Medicină și Științe Biologice, Universitatea Ștefan cel Mare, Suceava, România; elenaiuliaiorgu@gmail.com
IORGU Ionuț Ștefan – Universitatea Stefan cel Mare, Suceava, România; isiorgu@gmail.com
ISTRATE Diana – Department of Geography, Stefan cel Mare University, Suceava, Romania
IVĂNESCU Lăcrămioara-Carmen – Facultatea de Biologie, Universitatea „Alexandru Ioan Cuza” din Iași, Iași, România; ivanescu@uaic.ro
KERESZTES Lujza – Centre of Systems Biology, Biodiversity and Bioresources (3B), Advanced Hydrobiology and Biomonitoring Laboratory (LabHAB), Babeş-Bolyai University, Clinicilor 5-7, 400006, Cluj-Napoca, Romania; keresztes2012@gmail.com
KRIER Francois – UMR-T 1158, BioEcoAgro, University of Lille, Lille, France; francois.krier@univ-lille.fr
LEȚI Livia-Ioana – Universitatea „Alexandru Ioan Cuza” Iași, Facultatea de Biologie, România; Banca de Resurse Genetice Vegetale „Mihai Cristea” Suceava, România; lleti.ioana@gmail.com
MALAXA Daniel – Institute of Archaeology, Iași, Romania; danielmalaxa@yahoo.ro
MANCI Cosmin-Ovidiu – S.E.O.P.M.M. Oceanic-Club Constanța, Romania; cosminom@gmail.com
MANTEA Loredana-Elena – Faculty of Biology, Alexandru Ioan Cuza University of Iași, Iași, Romania; BioActive Research Group, Alexandru Ioan Cuza University of Iasi, Iasi, Romania; mantealoredana9@gmail.com
MĂRIA Raluca – Biology Teaching Master Program, Faculty of Psychology and Educational Sciences, Alexandru Ioan Cuza University, Iași, Romania; ralucam238@gmail.com
MELENCIUC Raluca – Faculty of Natural and Agricultural Sciences, Ovidius University of Constanța, Romania; raluca.melenciuc@gmail.com
MELNICIUC Ioana Mădălina – Școala Gimnazială „Nicolae Iorga” Buhalnița- Iași, Universitatea „Alexandru Ioan Cuza” din Iași, România; Universitatea „Alexandru Ioan Cuza” din Iași, Facultatea de Psihologie și Științe ale Educației, România; ioana_madalina001@yahoo.com
MESSAGER Erwan – EDYTEM, UMR 5204 CNRS, Univ. Savoie Mont Blanc, Pôle Montagne, 73376, Le Bourget du Lac, France; erwan.messager@univ-smb.fr
MICU Cristian – Institutul de Cercetări Eco-Muzeale „Gavrilă Simion” Tulcea, România; cristianmicu72@gmail.com
MIHAI Cosmin-Teodor – Department of Experimental and Applied Biology, Institute of Biological Research Iasi, 47 Lascar Catargi Str., 700107 Iasi, Romania; Praxis Medical Investigations, 700505 Iasi, Romania; mihai.cosmin.teo@gmail.com

MIHĂILĂ Ilarion – Universitatea „Alexandru Ioan Cuza” Iași, Facultatea de Fizică, România
MIHĂȘAN Marius – BioActive Research Group, Department of Biochemistry and Molecular Biology, Alexandru Ioan Cuza University, Iasi, Romania; marius.mihasan@uaic.ro
MIRON Anca – Department of Pharmacognosy, Faculty of Pharmacy, University of Medicine and Pharmacy “Grigore T. Popa” Iasi, Romania
MITROIU Mircea-Dan – Faculty of Biology, Alexandru Ioan Cuza University of Iași, Bd. Carol I 20A, 700505 Iași, Romania; mircea.mitroiu@uaic.ro
MLEȘNIȚĂ Andreea-Mihaela – BioActive research group, Biology Faculty, Alexandru Ioan Cuza University of Iași, 700506 Iasi, Romania; Institute of Biochemistry and Molecular Biology, ZBMZ, Faculty of Medicine, Albert-Ludwigs-University Freiburg, 79104 Freiburg, Germany; mlesnitaanda@gmail.com
MUNTEANU Iustin-Tiberius – Faculty of Biology, University „Alexandru Ioan Cuza” of Iași, Iași, Romania; tibimunteanu897@gmail.com
NEAGU Anca-Narcisa – Facultatea de Biologie, Universitatea Alexandru Ioan Cuza din Iași, Iași, România; aneagu@uaic.ro
NECHIFOR Maria-Alexandra – Școala gimnazială „Ionel Teodoreanu” din Iași, Iași, România, marianechifor240@gmail.com
NECHITA Elena – MIB TH laboratory, Iasi, Romania; elena.nechita@industrialbiotech.biz
OLARU Mihăiță Ștefan – Facultatea de Biologie, Universitatea „Alexandru Ioan Cuza” din Iași, Iași, România; stefan.olaru@uaic.ro
PERJU Felicia-Mura – Colegiul Național „Garabet Ibrăileanu” din Iași, România
PETRAȘ Ancuța – Department of Geography, Stefan cel Mare University, Suceava, Romania; ancuta.petras@yahoo.com
PETREANU Ionuț-Cătălin – Faculty of Biology, Alexandru Ioan Cuza University of Iași, Romania; icpetreanu@yahoo.com
PETRESCU Denisa-Elena – Universitatea „Alexandru Ioan Cuza” Iași, Facultatea de Biologie, România; Banca de Resurse Genetice Vegetale „Mihai Cristea” Suceava, România
PETRILA Daria-Bianca – BioActive Research Group, Alexandru Ioan Cuza University of Iasi, Iasi, Romania; dariapetrila@yahoo.com
PINTILIOAIE Alexandru-Mihai – Stațiunea Biologică Marină „Prof. Dr. Ioan Borcea” Agigea; alexandrupintintilioaie@gmail.com
PIOARĂ Mihaela – Faculty of Biology, Alexandru Ioan Cuza University of Iași, Iași, Romania; pioara.mihaela@yahoo.com
PÎRNĂU Ludmila – Faculty of Biology, Alexandru Ioan Cuza University of Iași, Iași, Romania; Romanian Academy – Iași Branch, Institute of Archaeology, Iași, Romania; ludmila.pirnau@gmail.com
POPOVICI Mariana – Centrul de Cercetări Antropologice „Olga Necrasov”, Academia Română Filiala Iași, România; Facultatea de Biologie, Universitatea „Alexandru Ioan Cuza” din Iași, Iași, România; sorexmin@yahoo.com
RADU Valentin – MNIR & Archaoesciences Bucarest, Romania; raduvalentin@hotmail.com
RASPLUS Jean-Yves – CBGP, INRAE, CIRAD, IRD, Montpellier SupAgro, Univ Montpellier, Montpellier, France; jean-yves.rasplus@inrae.fr
RODIDEAL Tatiana – Facultatea de Biologie, Universitatea „Alexandru Ioan Cuza” din Iași, Iași, România; tatiana.rodideal@yahoo.com
ROSU Craita Maria – Department of Experimental and Applied Biology, Institute of Biological Research Iasi, 47 Lascar Catargi Str., 700107 Iasi, Romania; craita2002@yahoo.com

ROUBAL Amina – Badji Mokhta-Annaba University P.O Box.12, Annaba-23000 Algeria; aminaaroubal@gmail.com
RUICĂNESCU Adrian – Institute of Biological Research Cluj-Napoca, Romania; adrian.ruicanescu@icbcluj.ro
SAHLEAN Tiberiu Constantin – Institute of Biology - Bucharest, Romanian Academy, Bucharest, Romania; Department of Exact and Natural Sciences, Alexandru Ioan Cuza University of Iași, Romania; tiberiu.sahlean@gmail.com
SARAGEA Paula Denisa – Faculty of Biology, Alexandru Ioan Cuza University of Iași, Iași, Romania; paula_denisa_2000@yahoo.com
SARDARIU Oana – Colegiul Național „Mihai Eminescu” Iași, România
SAVA Alexandra-Roxana – Facultatea de Biologie, Universitatea „Alexandru Ioan Cuza” din Iași, Iași, România; shealex95@gmail.com
SAVU Mihaela – Faculty of Biology, Alexandru Ioan Cuza University of Iași, Iași, Romania; mihaelasavu2@gmail.com
SHAHER Shurooq Asaad Abdulameer – Dept. Biophysics and Physiology, Faculty of Biology, University of Bucharest, Romania**;** Dept. Medical laboratories. Babylon Technical Institute, Alfurat Al Awsat Technical University, Iraq**;** drshuruq73@gmail.com
SIMALCSIK Angela – Centrul de Cercetări Antropologice „Olga Necrasov”, Academia Română Filiala Iași, România; Rezervația Cultural-Naturală „Orheiul Vechi”, Republica Moldova; Institutul de Cercetări Bioarheologice și Etnoculturale, Chișinău, Republica Moldova; angellisimal@gmail.com
SIMALCSIK Robert Daniel – Centrul de Antropologie „Olga Necrasov”, Academia Română Filiala Iași, România; Institutul de Cercetări Bioarheologice și Etnoculturale Chișinău, Republica Moldova**;** robyboy2@yahoo.com
SISERMAN Costel Vasile – Facultatea de Medicină, Universitatea de Medicină și Farmacie „Iuliu Hațieganu” din Cluj-Napoca, Institutul de Medicină Legală din Cluj-Napoca, Romania; sisermanleg@yahoo.com
SPASENI Petronel – Faculty of Biology, Alexandru Ioan Cuza University of Iași, Romania; Department of Exact and Natural Sciences, Institute of Interdisciplinary Research, Alexandru Ioan Cuza University of Iași, Romania; awpe94@gmail.com
STANC Margareta-Simina – Faculty of Biology, Alexandru Ioan Cuza University of Iași, Romania; simina.stanc@uaic.ro
ȘTEFAN Gabriela-Alina – „Ștefan cel Mare” University of Suceava, Faculty of Medicine and Biological Sciences, Suceava, Romania; gabriela.stefan@usm.ro
ȘTEFAN Marius – BioActive Research Group, Faculty of Biology, Alexandru Ioan Cuza University of Iasi, Romania; stefanm@uaic.ro
STEFANACHE Camelia – “Stejarul” Biological Research Centre, Alexandru cel Bun 6, Piatra Neamt, NIRDBS Bucharest, Romania
STRĂJERU Silvia – Banca de Resurse Genetice Vegetale „Mihai Cristea” Suceava, România
STRUGARIU Alexandru – Department of Exact and Natural Sciences, Institute of Interdisciplinary Research, Alexandru Ioan Cuza University of Iași, Romania; alex.strugariu@gmail.com
STRUNGARIU Ioan – Faculty of Biology, Alexandru Ioan Cuza University of Iasi, Iasi, Romania; ionut.strungariu@yahoo.com
SURUGIU Victor - Facultatea de Biologie, Universitatea „Alexandru Ioan Cuza” din Iași, Iași, România**;** vsurugiu@uaic.ro
SZMONIEWSKI Bartłomiej – Polish Academy of Sciences, Cracow, Poland; bartheque@yahoo.fr
TANAS Mihaela – BioActive Research Group, Alexandru Ioan Cuza University of Iasi, Iasi, Romania; mihaela.tanas2001@gmail.com

TĂUȘAN Ioan – Department of Environmental Sciences, Lucian Blaga University of Sibiu; Applied Ecology Research Centre, Dr. Raţiu 5-7, 550012 Sibiu, Romania; ionut_tausan2007@yahoo.com
TENCARIU Felix-Adrian – Centrul Arheoinvest, Departamentul Științe Exacte și Științe ale Naturii, Institutul de Cercetări Interdisciplinare, Universitatea „Alexandru Ioan Cuza” din Iași, România; adifex@gmail.com
TEREC Andrei-Bogdan – Centre of Systems Biology, Biodiversity and Bioresources (3B), Advanced Hydrobiology and Biomonitoring Laboratory (LabHAB), Babeş-Bolyai University, Clinicilor 5-7, 400006, Cluj-Napoca, Romania; Doctoral School of Integrative Biology, Babeş-Bolyai University, Republicii 44, 400015, Cluj-Napoca, Romania; andrei.terec@ubbcluj.ro
TOPALĂ Ionuț – Universitatea „Alexandru Ioan Cuza” Iași, Facultatea de Fizică, România
TRIFAN Adriana – Faculty of Pharmacy, “Grigore T. Popa” Univ. of Medicine and Pharmacy, Iasi, Romania; “Stejarul” Biological Research Centre, Alexandru cel Bun 6, Piatra Neamt, NIRDBS Bucharest, Romania
TUDOSE Cristian – Faculty of Biology, Alexandru Ioan Cuza University of Iași, Iași, Romania; cristian.tudose@uaic.ro
VĂLEANU Mădălin-Cornel – Complexul Muzeal Naţional „Moldova” Iaşi, România, Muzeul de Istorie; madalinvaleanu@yahoo.com
VAN NOORT Simon – Research and Exhibitions Department, South African Museum, Iziko Museums of South Africa, PO Box 61, Cape Town, 8000, South Africa; svannoort@iziko.org.za
VASILIEV Iuliana – Senckenberg Biodiversity and Climate Research Centre (BiK-F), Frankfurt am Main, Germany
VOCHITA Gabriela – Department of Experimental and Applied Biology, Institute of Biological Research Iasi, 47 Lascar Catargi Str., 700107 Iasi, Romania; gabrielacapraru@yahoo.com
VOINEA Valentina – MINA Constanța, Romania
WHITHAM Danielle – Biochemistry & Proteomics Laboratories, Department of Chemistry & Biomolecular Science, Clarkson University, 2020; whithad@clarkson.edu
ZAMFIRACHE Maria Magdalena – Facultatea de Biologie, Universitatea Alexandru Ioan Cuza din Iași, Iași, România; magda@uaic.ro
ZAMFIRESCU Oana – Faculty of Biology, Alexandru Ioan Cuza University of Iași, Romania, o_zamfirescu@yahoo.com
ZAMFIRESCU Ștefan-Remus – Faculty of Biology, Alexandru Ioan Cuza University of Iași, Romania; s.zamfirescu@gmail.com
ZANOCI Aurel – Facultatea de Istorie și Filosofie, Universitatea de Stat din Moldova, Chișinău, Republica Moldova; azanoci@gmail.com