# SESIUNEA ȘTIINȚIFICĂ A FACULTĂȚII DE BIOLOGIE

## *TENDINȚE IN BIOLOGIE: DE LA MOLECULE LA SISTEME COMPLEXE*

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# VOLUM DE REZUMATE

Facultatea de Biologie

Grădina Botanică

Muzeul de Istorie Naturală

Academia Română
Filiala Iași

Asociația Studenților
Biologi din Iași

**ORGANIZATORI:**
**Facultatea de Biologie**
În parteneriat cu:
**Grădina Botanică "Anastasie Fătu"**
**Muzeul de Istorie Naturală din Iași**
**Academia Română, Filiala Iași**
**Asociația Studenților Biologi din Iași**

| TEME | EVENIMENTE |
|---|---|
| TAXONOMIE ȘI ECOLOGIE | Secția ***Taxonomia și ecologia insectelor*** |
| | Secția ***General 1*** |
| | Masa rotundă ***Poluarea și efectele sale asupra organismelor***, în colaborare cu Academia Română – Filiala Iași, Comisia pentru Combaterea Poluării Mediului |
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| | Expoziția ***Flori de toamnă***, Grădina Botanică „Anastasie Fătu” din Iași, ediția a-XLVI-a |

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## *TAXONOMIE ȘI ECOLOGIE*

## SECȚIA: *TAXONOMIA ȘI ECOLOGIA INSECTELOR*

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### *LASIOPTERA RUBI*, DĂUNĂTOR AL PLANTELOR DE *RUBUS IDAEUS*

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Statutul de dăunător al speciei *Lasioptera rubi* (Schrank) (*Diptera: Cecidomyiidae*) asupra culturilor de zmeur (*Rubus idaeus* L.) a fost recunoscut în mod diferit de către cercetători şi chiar acest statut a fost modificat în timp de la un dăunător minor la unul major în diferite ţări. În România abia în ultimii ani *L. rubi* a fost acceptat drept un dăunător al plantaţiilor de zmeur, în prezent fiind un dăunător răspândit în toată ţara în locurile în care este cultivat zmeurul. Cea mai indicată metodă de combatere a acestui dăunător este controlul vizual al tulpinilor începând cu toamna târziu până primăvara devreme, tulpinile atacate fiind tăiate şi înlăturate.

# FIRST RECORD OF *CHALCEDECTIDAE* (*HYMENOPTERA: CHALCIDOIDEA*) IN THE AFROTROPICAL REGION

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The family *Chalcedectidae* (*Hymenoptera: Chalcidoidea*) is recorded for the first time in the Afrotropical region. Several new species are illustrated and their currently known distribution in the Afrotropical region is presented.

# NATURA 2000 *LEPIDOPTERA* FROM ROSCI0135 BÂRNOVA-REPEDEA IDENTIFIED IN 2015-2016

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In the Natura 2000 factsheet for ROSCI0135 Bârnova-Repedea, variant from 2017 and the online variant form 2024, with the mention of the update from 2020.12 (N2K ROSCI0135 dataforms (europa.eu)), there are enumerated three species of *Lepidoptera*: *Euplagia* (*Callimorpha*) *quadripunctaria* (Poda), *Euphydryas maturna* Linnaeus and *Lycaena dispar* (Haworth). There are another two species of Natura 2000 *Lepidoptera* present in the site but not mentioned in the Natura 2000 factsheet for ROSCI0135 Bârnova-Repedea: *Zerynthia polyxena* (Denis & Schiffermüller) and *Parnassius mnemosyne* (Linnaeus), so in reality there are five Natura 2000 *Lepidoptera* species present in the site. *L. dispar*, *E. maturna* and *E. quadripunctaria* are present in the Annexe II from the Habitat Directive 92/43 CEE. *Z. polyxena*, *P. mnemosyne*, *L. dispar* and *E. maturna* are present in the Annexe IV from the Habitat Directive. *P. mnemosyne* (LC), *L. dispar* (NT) and *E. maturna* (DD) are mentioned in the IUCN Red List of Threatened Species. *Z. polyxena* (LC), *P. mnemosyne* (NT), *L. dispar* (LC) and *E. maturna* (VU) are mentioned in the IUCN Red Lists of Threatened Species for Europe. *Z. polyxena, P. mnemosyne, L. dispar* and *E. maturna* are included in the Annexe II from the Bern Convention. *L. dispar, E. maturna* and *E. quadripunctaria* are listed in the Annexe I of the Resolution 6 of the Bern Convention. *Z. polyxena* (EN) and *E. maturna* (EN) are enumerated in the Draft Red List of Butterflies (*Lepidoptera: Papilionoidea*) of the Carpathian Mountains. *L. dispar* and *E. maturna* are mentioned in the Red Book of Invertebrates of Romania. All the species are included in OUG 57/2007: *L. dispar* and *E. maturna* in the Annexe 3 and 4a, *E. quadripunctaria* in the Annexe 3, *Z. polyxena* and *P. mnemosyne* in the Annexe 4a.

# NATURA 2000 *COLEOPTERA* FROM ROSCI0135 BÂRNOVA-REPEDEA IDENTIFIED IN 2015-2016

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In the Natura 2000 factsheet for ROSCI0135 Bârnova-Repedea, the online variant from 2024 (update 2020.12) (N2K ROSCI0135 dataforms (europa.eu)), there are enumerated eight species of *Coleoptera*: *Carabus variolosus* Fabricius, *Rhysodes sulcatus* (*Fabricius*) (*Carabidae*), *Rosalia alpina* (Linnaeus), *Morimus funereus* Mulsant, *Cerambyx cerdo* Linnaeus (*Cerambycidae*), *Lucanus cervus* (Linnaeus) (*Lucanidae*), *Bolbelasmus unicornis* (Schrank) (*Geotrupidae*), *Cucujus cinnaberinus* (Scopoli) (*Cucujidae*). Another one species is present in site but not mentioned in the Natura 2000 factsheet for ROSCI0135 Bârnova-Repedea: *Osmoderma barnabita* Motschulsky (as *O. eremita* in Natura 2000) (*Scarabaeidae*), so in reality there are nine Natura 2000 *Coleoptera* species present in the site. All the nine species are present in the Annexe II from the Habitat Directive 92/43 CEE. *C. variolosus*, *R. alpina*, *C. cerdo, B. unicornis, O. barnabita, C. cinnaberinus* are present in the Annexe IV from the Habitat Directive. *R. alpina* (VU), *M. funereus* (VU), *C. cerdo* (VU), *O. barnabita* (NT), *C. cinnaberinus* (NT) are mentioned in the IUCN Red List of Threatened Species. *R. sulcatus* (EN), *R. alpina* (LC), *C. cerdo* (NT), *L. cervus* (NT), *O. eremita* (NT), *C. cinnaberinus* (NT) are mentioned in the IUCN Red Lists of Threatened Species for Europe. *R. alpina, C. cerdo, O. eremita, C. cinnaberinus* are included in the Annexe II from the Bern Convention. *L. cervus* is included in the Annexe III from the Bern Convention. *C. variolosus*, *R. sulcatus, M. funereus, L. cervus, B. unicornis, O. eremita, C. cinnaberinus* are listed in the Annexe I of the Resolution 6 of the Bern Convention. *C. variolosus* (VU), *R. sulcatus* (EN*), R. alpina* (VU), *M. funereus* (VU), *C. cerdo* (VU), *B. unicornis* (CR), *O. eremita* (VU), *C. cinnaberinus* (NT) are mentioned in the Red Book of Invertebrates of Romania. All the nine species are included in the Annexe 3 and 4a from the OUG 57/2007.

# *COPROPHAGOUS SCARABAEIDAE* IDENTIFIED IN THE COW DUNG IN THE PRAHOVA VALLEY IN 2006

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In the period May – September 2006 it was collected 25 cow dungs (5 per month) from the Prahova Valley (Prahova County). Every cow dung it was put in a recipient full of water and the collected *Scarabaeidae* (sensu lato, including *Geotrupidae*) were identified. It was collected 1786 specimens from 13 species: *Copris lunaris* (Linnaeus), *Geotrupes stercorarius* (Linnaeus), *Anoplotrupes* (*Geotrupes) stercorosus* (Hartmann), *Trypocopris (Geotrupes) vernalis* (Linnaeus), *Pentodon idiota* (Herbst), *Caccobius schreberi* (Linnaeus), *Euoniticellus (Onticellus) fulvus* (Goeze), *Onthophagus vacca* (Linnaeus), *Onthophagus ovatus* (Linnaeus), *Aphodius aestivalis* Stephens, *Aphodius fimetarius* (Linnaeus), *Aphodius rufipes* (Linnaeus), *Teuchestes (Aphodius) fossor* (Linnaeus). The most abundant species were *O. ovatus* (453 specimens), *A. fimetarius* (426), *C. lunaris* (246), *E. fulvus* (226) and *A. stercorosus* (217). 69.32% were euconstant species (*O. vacca, O. ovatus, E. fulvus, A. stercorosus, C. lunaris, C. schreberi, A. fimetarius, A. aestivalis*) and 30.7% accidental species (*T. vernalis, G. stercorarius, A. rufipes, T. fossor*). *O. ovatus* it was the most frequent species, followed by A. *fimetarius, C. lunaris, E. fulvus* and *A. stercorosus*.

# ECTOPARASITOSIS RECORDED IN ANIMALS INVESTIGATED AT THE “MEDICRISVET” VETERINARY CLINIC IN FĂLTICENI IN 2023

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We investigate the prevalence and transmission dynamics of animal ectoparasitic infections recorded at “MEDICRESVET” veterinary clinic in Fălticeni (Suceava county) during 2023. Samples from the animal hosts were analyzed using light microscopy as the primary examination technique. It was investigated 120 animals (cats, dogs, hamsters), 95 being infested with 4 ectoparasitic species belonging to *Arachnida*: *Rhipicephalus sanguineus* (Latreille) (*Ixodida: Ixodidae*) (on dogs), *Otodectes cynotis* Hering (*Sarcoptiformes: Psoroptidae*) (on cats), *Demodex cati* (Megnin) (*Trombidiformes: Demodecidae*) (on cats) and *Demodex criceti* Nutting & Rauch (*Trombidiformes: Demodecidae*) (on hamsters). *Rhipicephalus sanguineus* was found on 41 dogs, mainly on ears (15) and neck (13), but also on the back (6), head (3), abdomen (2) and legs (2). If we consider the sex and age, 22 dogs were males and 19 females, 19 dogs were under one year, 15 between 1-3 years and 7 between 3-12 years. In 26 cases the dogs were the common race and the others German Shepherd (4), Bucovina Shepherd (3), Central Asian Shepherd (3), Cane Corso (2), Lagotto Romagnolo (2) and German Shorthaired Pointer (1). *Otodectes cynotis* was found on the ears of 34 cats, 19 males and 15 females, 28 under one year and 6 older than one year. In 25 cases the cats were common race and the others were British Shorthair (3), Persian (3), Siamese (3) and Birman (1). *Demodex cati* was found on the skin of 12 cats, 8 males and 4 females, 9 under one year, 2 at two years and 1 on four year. In 7 cases were common race and the others were Siamese (3), Ragdoll (1) and Birman (1). *Demodex criceti* was found on the skin of 8 Syrian (Golden) hamsters (*Mesocricetus auratus* Waterhouse), 6 males and 2 females, 5 between 1-2 years and 3 between 2-3 years.

## *TAXONOMIE ȘI ECOLOGIE*

## SECȚIA: *GENERAL 1*

## COMUNICĂRI ORALE

### CODRII IAȘILOR - NATURAL PARK DESIGNATION: FROM CIVIL INITIATIVE TO SCIENTIFIC SUBSTANTIATION

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The plateau and hilly area of Moldova includes prioritised habitats of contact between continental and steppe-silvosteppe regions. It has an equally rich historical and intangible cultural heritage of recognised value. Despite these attributes, no Natural Park has yet been designated in the historical province.

The initiative of the “Codrii Iașilor” NGO and specialists in philology, biology, geography and archaeology has contributed to a substantiation study that assesses the potential and concludes on the fact that “Codrii Iașilor” is scientifically compatible with IUCN and national criteria for a Natural Park.

The proposed area of 21,191.783 hectares includes the ROSCI0135 and ROSPA0092 sites, natural reserves (Locul fosilifer Dealul Repedea, Poiana cu Schit etc.), cultural-touristic attractions ("Saint Pantelimon" wooden church, monasteries etc.) and archaeological sites (Poiana cu Cetate, Cetățuia, Palanca, Dealul Bobeica), all acting as testimony to a significant legacy. Cultural values are an integrated part of the territory: customs, crafts, superstitions, and traditional practices of managing the land lead to unique landscapes. These can further support tourism as a significant source of income for inhabitants.

Bârnova forest offers a remarkable habitat and flora diversity. Five Natura 2000 habitats (9130, 91Y0, 6520, 62C0*, 40C0*), two types of national habitats (R5310, R5301), and a rich and varied flora (909 species, 391 infraspecies), including rare plants listed in Romania's Red List, are outlined in the study. The fauna is rich in species protected by national and European agreements.

So far, 18 invertebrates of community interest, 20 of herpetofauna (18 included in OUG 57/2007), a diverse bird fauna including 126 species (80 in OUG 57/2007), and 33 mammals (31 in OUG 57/2007) were identified.
The Natural Park status can foster a unified management of the complex Bârnova Repedea area, a landscape ensemble where the interaction of human activities with nature is based on in-situ conservation of ecosystems and habitats.

## EVIDENCE OF INTRAGUILD PREDATION ON *PELOBATES FUSCUS* AND CANNIBALISM IN MARSH FROGS (*PELOPHYLAX RIDIBUNDUS*) FROM DANUBE DELTA, ROMANIA

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Intraguild predation, including cannibalism, where species within the same trophic level prey on each other, is a well-documented ecological phenomenon. Anurans, such as the marsh frog *Pelophylax ridibundus*, are generalist predators that typically consume invertebrates, but larger individuals may also prey on small vertebrates, with vertebrate predation positively correlated with body size. In this note, we document two cases of predation by *P. ridibundus* observed during nocturnal field surveys in the commune of Sfântu Gheorghe, Tulcea County, Romania. The first case involves predation on the common spadefoot toad *Pelobates fuscus*. The second case involves cannibalism, with a larger P. ridibundus preying upon a smaller conspecific. Both observations suggest that the abundance and size variation within local *P. ridibundus* populations may drive such predatory behaviors. These findings enhance our understanding of the predatory capabilities and ecological roles of *P. ridibundus*, highlighting the importance of studying amphibian interactions within shared habitats.

## COLD REGIONS, DARK SNAKES: CLIMATIC DRIVERS OF MELANISM IN ADDERS (*VIPERA BERUS*)

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Animal coloration is an extremely adaptive phenotypic trait that responds to various selective forces, including climatic factors. The thermal melanism hypothesis predicts that darker morphs of ectotherms should be more frequent in colder geographic regions due to their thermoregulatory advantages. The common adder (*Vipera berus*) is one of the most extensively studied reptiles in relation to color polymorphism – where two or more color morphs coexist within the same population – particularly concerning the occurrence and persistence of melanism. In this study, we used georeferenced photographs from open science databases to explore whether intraspecific color variation in adders aligns with the thermal melanism hypothesis. Each adder's dorsal coloration was recorded, and the relationship between their coloration, climate variables, and specific locations was analyzed. We hypothesized that darker individuals would be more common in colder regions and at higher elevations, consistent with the thermal melanism hypothesis. Our findings demonstrate that temperature is a strong predictor of the occurrence of darker individuals, particularly melanistic adders, thus supporting the thermal melanism hypothesis. While elevation and low precipitation also influence coloration, their impact is smaller compared to temperature. Overall, melanistic adders were more frequently found in colder areas, whereas lighter-colored individuals were more common in warmer areas with higher solar radiation. This study highlights the crucial role of temperature in shaping the distribution of melanistic adders and provides empirical support for the thermal melanism hypothesis. Additionally, the use of community-contributed data was instrumental in providing a broad perspective on how climatic factors influence the phenotypic traits of *V. berus*.

# THERMAL PREFERENCES IN *VIPERA (BERUS) NIKOLSKII* UNDER LABORATORY CONDITIONS

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

# REZULTATE PRELIMINARE PRIVIND SELECȚIA MICROHABITATELOR LA VIPERA DE STEPĂ MOLDAVĂ (*VIPERA URSINII MOLDAVICA*)

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Modul în care organismele selectează și folosesc habitatele este un obiectiv central în domeniul ecologiei, mai ales din punct de vedere al conservării biodiversității. În cadrul habitatului unei specii, există micro-habitate care sunt definite ca spații cu caracteristici specifice pentru care organismele optează în funcție de diverși factori, cum ar fi disponibilitatea și accesul la resurse, interacțiunile intraspecifice și cele interspecifice.

În viața reptilelor, temperatura și umiditatea joacă un rol important având implicații directe în funcțiile fiziologice precum metabolism, menținerea echilibrului hidric și digestie. Mai mult decât atât, acestea pot influența și declanșarea anumitor comportamente precum cel de căutare a hranei. Pe lângă acești doi factori, structura și tipul vegetației sunt extrem de importante pentru animalele poichiloterme, implicând deseori un compromis între nevoia de a se ascunde de prădători sau pradă și nevoia de termoreglare.

La nivel global, reptilele sunt un grup care se confruntă cu un declin populațional cauzat de pierderea și degradarea habitatelor, poluarea mediului și schimbările climatice. Este și cazul viperei de stepă moldavă (Vipera ursinii moldavica), cea mai amenințată viperă din Europa. Această viperă mai este prezentă în câteva habitate stepice din regiunea Moldovei și în unele zone din Delta Dunării.

Scopul acestui studiu este de a analiza selecția microhabitatelor la V. u. moldavica în cadrul habitatelor stepice din rezervația naturală „Fânațele seculare Valea lui David”. Am realizat transecte vizuale acoperind trei sezoane de activitate din luna aprilie până în luna octombrie 2024. În cadrul monitorizărilor, am notat temperatura și umiditatea la nivelul solului, precum și înălțimea și procentul de acoperire cu vegetație pentru fiecare observație precum și pentru puncte aleatorii din zona investigată. Rezultate analizelor statistice (modele liniare mixte – GLMM) arată că procentul de acoperire cu vegetație influențează pozitiv prezența viperei de stepă moldavă.

# UPDATING THE CURRENT DISTRIBUTION OF *HIRUDO* SPP. IN THE WESTERN PALEARCTIC BASED ON CITIZEN SCIENCE AND OPEN-SOURCE DATA

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Medicinal leeches (*Hirudo* spp.) have long been recognized for their ecological, medicinal, and conservation importance. Historically used in medicine, these species are now considered valuable indicators of freshwater ecosystem health, yet their populations have been increasingly threatened by habitat degradation, pollution, and climate change. Understanding their current distribution is essential for conservation efforts, especially in the light of their role in maintaining biodiversity and ecosystem function. Accurate knowledge of the geographic distribution of *Hirudo* species is crucial for assessing population trends, identifying critical habitats, and guiding conservation policies. In this study, we present an updated distribution map of *Hirudo* spp. across the Western Palaearctic, using a combination of citizen science data and open-source information from scientific literature. In addition to data aggregation, we performed species distribution modeling (SDM) to predict potential distribution and address gaps in known records. By analyzing these data, we not only fill existing knowledge gaps in under-surveyed areas but also predict additional suitable habitats through SDM. This large-scale distribution map illustrates the importance of integrating citizen-contributed data with traditional research for a more comprehensive understanding of the distributions of medicinal leeches. Our findings highlight new regions of potential ecological significance and offer critical insights for conservation strategies aimed at protecting *Hirudo* spp. populations from ongoing environmental threats. This approach underscores the growing value of citizen science in ecological research and biodiversity conservation, and our results provide a vital foundation for future efforts to monitor and protect these ecologically important species.

# MIGRATION PATTERNS AND WEATHER INFLUENCES ON COMMON CHIFFCHAFF AND WILLOW WARBLER IN THE WESTERN BLACK SEA REGION

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The Agigea Bird Observatory in southeastern Romania, the country's only year-round ringing station, has recorded the migration patterns of 128 bird species that either migrate through or exhibit movement within southeastern Romania. This study focuses on two warbler species, the Common Chiffchaff (*Phylloscopus collybita*) and the Willow Warbler (*Phylloscopus trochilus*), to analyze their migration dynamics and the influence of weather conditions during both spring and fall migrations in the Western Black Sea region.

In terms of subspecies, *Phylloscopus collybita collybita* dominates the migration of the Common Chiffchaff through the observatory, with less than 1% of individuals identified as *Phylloscopus collybita abietinus*. Similarly, *Phylloscopus trochilus trochilus* represents the majority of Willow Warblers, with less than 1% belonging to *Phylloscopus trochilus acredula*. These results contradict broader scientific literature, which suggests that *Phylloscopus collybita abietinus* and *Phylloscopus trochilus acredula* are the primary subspecies migrating through Eastern Europe.

To investigate the factors influencing migration, General Linear Mixed Models (GLMMs) were applied to both species, incorporating weather-related variables over three consecutive years (2019–2021). For the Common Chiffchaff, spring migration was influenced by mean temperatures in Turkey and Romania, as well as atmospheric pressure in Israel. In fall, migration patterns were affected by the North Atlantic Oscillation (NAO) and atmospheric pressure in Finland. The Willow Warbler's autumn migration was influenced by the NAO and atmospheric pressure in Israel, while both NAO and mean temperatures in Romania played a key role in autumn movements.

These findings provide valuable insights into subspecies migration dynamics and the environmental factors that shape bird migration in the region, contributing to a deeper understanding of avian movement through southeastern Romania.

# SITUAȚIA ACTUALIZATĂ A POPULAȚIEI DE *LIGULARIA GLAUCA* (L.) O. HOFFM. DE LA CALAFINDEȘTI (JUD. SUCEAVA)

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Mărimea populației și unii parametri cantitativi specifici, pot constitui aspecte semnificative pentru evaluarea stării de conservare a speciilor rare. Acumularea unor astfel de date permite înțelegerea dinamicii populațiilor într-un context ecologic și poate conduce la formularea unor strategii eficiente de management. *Ligularia glauca* (L.) O. Hoffm. este considerată o specie relict glaciar, rară în România. Arealul principal al speciei este în Asia, extins și în câteva țări din Europa unde populațiile sunt distribuite neuniform, putând fi apreciată astfel ca specie euro-siberiană.
Având în vedere importanța conservativă a acestei specii, scopul studiului a fost actualizarea informațiilor privind mărimea populației de Ligularia glauca din cadrul ariei protejate ,,Fânațele seculare de la Calafindești”. Pentru a obține o evaluare cât mai precisă a dimensiunii populației, am efectuat o cartare detaliată a grupărilor de indivizi, care ne-a permis să identificăm și distribuția acestora în sit. Metoda a constat în stabilirea de suprafețe de probă de 25 m² și numărarea tuturor indivizilor, ținând cont și de aspectele stadiului de dezvoltare, respectiv diferențierea între indivizii adulți în stare vegetativă și cei adulți fertili. În cazul indivizilor adulți fertili, au fost cuantificați o serie de parametri cantitativi, urmărindu-se lungimea tulpinii florifere și a inflorescenței, precum și numărul de calatidii.
Rezultatele studiului permit o actualizare a mărimii populației de *Ligularia glauca*, fiind identificați un total de 2502 indivizi. Comparativ cu cercetările precedente, se observă o scădere considerabilă, studiile anterioare indicând un total de 4487 indivizi, diminuare datorată în principal factorilor de origine antropică.

# PARASITOSIS RECORDED IN THE HUMAN POPULATION INVESTIGATED AT THE “SF. DIMITRIE” HOSPITAL IN TÂRGU NEAMŢ IN 2023

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This study investigates the prevalence and transmission dynamics of human parasitic infections recorded at “Sf. Dimitrie” Hospital in Târgu Neamț during 2023. The research focuses on common parasitic infestations, including *Giardia lamblia* and *Ascaris lumbricoides*, examining their biological life cycles, clinical manifestations, and epidemiological patterns. Samples from the hospital's parasitological lab were analyzed using copro-parasitological with direct microscopy as the primary examination technique. Results reveal a seasonal variation in infestation rates, with a higher prevalence in rural populations than in urban settings. The study showed that 6.47% of the cases examined had positive parasite diagnoses. Out of these, 4.15% were carriers of *Ascaris lumbricoides* and 2.32% were carriers of *Giardia lamblia*. The study found that a total of 3.07% of the 1205 individuals examined were infested with intestinal parasites, with the highest infestation rate observed in patients over 18 years of age. Ascaris lumbricoides was the most common parasite among adults, accounting for 2.16% of cases, while Giardia lamblia infestation was found in 0.91% of adults. Among children aged 1-3 years and 3-7 years, Ascaris lumbricoides and Giardia lamblia were the most prevalent parasites. Interestingly, no cases of *Ascaris lumbricoides* or *Giardia lamblia* were found in the 0-1 year age group, which had the fewest examinations and infestations. Gender and age group analyses indicate a significant incidence in adult women, especially in rural areas. The research further highlights the socio-environmental factors contributing to parasitic transmission, emphasizing poor hygiene and contaminated water as key drivers. Findings suggest the need for improved public health interventions, particularly in rural regions. This study also discusses treatment strategies for parasitic infections, focusing on the efficacy of antiprotozoal and anthelminthic drugs, such as metronidazole and albendazole. Future research should aim to develop more targeted prevention strategies and explore potential resistance mechanisms to existing treatments.

## *TAXONOMIE ȘI ECOLOGIE*

## SECȚIA: *GENERAL 1*

## POSTERE

### HISTOLOGICAL AND ANATOMICAL PECULIARITIES OF THE MEDICINAL SPECIES *PRIMULA VERIS* L.

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In addition to their nutritional benefits, plants also serve as valuable medicine for humans. *Primula veris* L., in particular, has been recognized since ancient times for its wide range of medicinal uses. This work aims to present the main anatomical and histological characters of the vegetative organs of the species *Primula veris* L. They present at anthesis only primary structure. The root has a tetrarch stele at the top, and towards the base an atypical structure for dicotyledonous angiosperms, with parenchyma in the central area. It presents a compact cortical parenchyma and numerous and short root hairs. The stem has the primary structure from the terminal part to the base, with vascular bundles arranged in a circle; pith and cortex present aeriferous spaces of different sizes, and numerous glandular trichomes are found on the epidermis. The lamina is bifacial heterofacial, with numerous glandular trichomes, shorter on the lower epidermis and longer on the upper one; all trichomes have a unicellular gland. Histo-anatomical features of medicinal plants are essential for accurate identification, quality control, understanding of medicinal properties, and supporting pharmacological research, all of which contribute to the safe and effective use of plant-based medicines.

# REACȚII FUNCȚIONALE ALE UNOR POPULAȚII LOCALE DE *SOLANUM LYCOPERSICUM* L. CULTIVATE ÎN CONDIȚII EXPERIMENTALE

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Obiectivul lucrării constă în cunoașterea posibilelor interrelații funcționale de tip alelopatic stabilite între populații locale de tomate (*Solanum lycopersicum* L.) și specii din flora spontană din ecosistemele agricole, în ideea îmbunătățirii condițiilor lor de cultivare în agricultura organică, folosind tratamente specifice de întreținere cu extracte vegetale pentru combaterea bolilor și dăunătorilor, comparativ cu tratamentele chimice aplicate curent în legumicultură.
Cercetările s-au realizat într-o cultură de tomate înființată prin răsad în solar, reprezentată de cinci populații locale originare din diferite zone geografice ale României.
Variantele experimentale au fost: V0- martor, fără tratament; V1- tratament cu extract apos de *Urtica dioica* L. preparat la rece, obținut din macerat de urzică (îngrășământ natural cu acțiune antifungică și insecticidă recunoscută) în proporție de 10:1 macerat în apă aplicat direct pe sol în jurul rădăcinilor și în proporție de 20: 1 macerat în apă pulverizat pe frunze la intervale de câte 10 zile, toată perioada de vegetație; V2- tratament chimic- soluție Captadin (15 g captan 80% dizolvate în 10 litri apă), fungicid polivalent de contact cu acțiune preventivă și curativă, aplicat periodic prin stropire la nivel foliar, toată perioada de vegetație.
S-au determinat practic numărul de frunze, de inflorescențe, de flori și fructe pe plantă, greutatea fructelor și indicele conținutului de clorofilă CCI măsurat in vivo la nivel foliar, raportarea datelor fiind susținută statistic.
Varianta de tratament V1 - aplicarea de extract apos de urzică obținut la rece prin udare la rădăcina plantelor și prin stropire la nivel foliar a indus un efect funcțional pozitiv celor cinci populații locale de tomate testate, manifestat printr-un ritm mai accentuat de formare și de creștere a organelor lor vegetative și de reproducere, printr-o producție finală mai mare de fructe pe plantă, precum și printr-o rezistență sporită la boli și dăunători, comparativ cu celelalte variante.

# CERCETĂRI PRIVIND MICROMORFOLOGIA ȘI HISTO-ANATOMIA SPECIEI *SCUTELLARIA ALBIDA* L.

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În ciuda importanței economice a speciilor de *Scutellaria* L., în literatura de specialitate se găsesc foarte puține studii referitoare la histo-anatomia acestora, deși caracterele histo-anatomice sunt parametri importanți din punct de vedere taxonomic în efortul de certificare și control al calității plantelor medicinale.

În acest context, lucrarea de față își propune să descrie histo-anatomia și micromorfologia organelor vegetative la plante aparținând speciei *Scutellaria albida* L. cultivate în câmpul experimental al Grădinii Botanice Naționale (Institutul) "Alexandru Ciubotaru"- Chișinău, Republica Moldova.

În literatura de specialitate nu au fost identificate, până la acest moment, date referitoare la histo-anatomia și micromorfologia organelor vegetative ale plantelor aparținând acestei specii.

Materialul vegetal utilizat în determinările histo – anatomice și micromorfologice a fost prelucrat conform protocolului de lucru din cadrul Laboratorului de Morfologie și Anatomie vegetală „Acad. Constantin Toma” și a celui din cadrul Laboratorului de Microscopie electronică din cadrul Facultății de Biologie, Universitatea „Alexandru Ioan Cuza” din Iași.

În urma investigațiilor realizate s-a constat că plantele acestei specii prezintă caractere micromorfologice și histo-anatomice specifice familiei Lamiaceae, dar și caractere unice:

•rădăcina principală va rămâne doar cu un corp lemnos central, cu o singură funcție în cadrul sistemului radicular, cea de fixare, pe când în cazul rădăcinilor laterale corpul lemnos central ocupă cam 2/3 din volumul lor, fapt ce arată că funcțiile de absorbție a sevei brute și de depozitare sunt dominante în această structură;

•tulpinile și frunzele prezintă o mare diversitate a structurilor epidermice (stomate, peri tectori și secretori).

# DROUGHT-TOLERANT ORNAMENTAL SPECIES: BIOLOGICAL CHARACTERISTICS AND POTENTIAL ECOLOGICAL BENEFITS

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The purpose of this paper is to highlight the biological characteristics of some decorative species and their potential uses, based on the analysis of the data reported in the specialized literature.
Seven drought-tolerant decorative herbaceous species belonging to three botanical families (Asteraceae, Lamiaceae, Portulacaceae) were studied.
Most of the species studied are native to South America. For ornamental purposes, they are often grown in urban green spaces (parks, public gardens, private gardens), in private gardens in the countryside as well as in pots (*Portulaca grandiflora, Gazania splendens*).
They have variously colored flowers, a long flowering period (from summer to late autumn) and attract a wide range of pollinating insects (bees, butterflies, bumblebees, etc.) contributing to the support of biodiversity.
Research carried out in recent years has shown the possibility of using some species in the phytoremediation of degraded lands as well as in the biological control of pests.

# ANALYSIS OF THE POPULATION CHARACTERISTICS OF *ALDROVANDA VESICULOSA* IN THE DANUBE DELTA, ROMANIA

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*Aldrovanda vesiculosa* is a critically endangered plant in Romania, threatened by water eutrophication and a decrease in its level. In this context, the study aimed to identify the environmental factors that influence the characteristics of *A. vesiculosa* populations.
The study was carried out in August 2024, in Perișor (Tulcea County). For the phytocoenological analysis, 66 relevés were carried out. A ProDSS Multiparameter Digital Water Quality Meter was used for the physical-chemical analysis of water. For the hydrological analysis of the main channel, the GPS Global Navigation Satellite System (GNSS) SPECTRA PRECISION SP80 and the SonTek Acoustic Doppler Current Profiler (ADCP) RiverSurveyor M9 equipment (SONTEK Company, San Diego, USA) with 3 × 3 transducers, each with a different orientation.
The results showed that *A. vesiculosa* grows in the associations *Typhetum angustifoliae*, *Spirodelo-Aldrovandetum*, *Caricetum ripariae, Schoenoplectetum lacustris, Nymphaeetum albae*, and *Scirpo-Phragmitetum*. Regarding the characteristics of the species, the results showed that the number of individuals analyzed varied from 5000 to 20000, and the plant length (cm) varied from 5 to 20 cm. The density of individuals varied from 3 to 320 per m2. The physical-chemical analysis of the water showed that *A. vesiculosa* preferred waters with moderate temperatures, from 22 °C to 27 °C, a more alkaline pH, from 8.5 to 10.5, low concentrations of ammonium and nitrate and depths of up to 0.23 m. The sediment analysis, as well as the hydrological data obtained, will be completed based on the detailed results of the ongoing research.

# ECOLOGY AND DISTRIBUTION OF TWO RARE SPECIES OF THE GENUS *IRIS* IN ROMANIA: *IRIS BRANDZAE* AND *I. SINTENISII*

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*Iris brandzae* and *I. sintenisii* are threatened plant species in Romania, which have not been sufficiently studied in terms of their distribution and ecological needs until now. Populations of these species are declining, primarily due to the impact of human activities and climate variations. There is a general lack of studies focusing on rare species distribution and ecological conditions. In this context, the present study aims to examine the ecological conditions and update the distribution of these species in Romania. Data on topographical, bioclimatic, anthropogenic, and chemical soil factors were collected for each analysed population. The hierarchical agglomerative clustering method was applied for vegetation classification, using the ß-flexible algorithm with ß = -0.25 and the Bray-Curtis dissimilarity.

The study revealed that *I. brandzae* was identified in 19 localities from Botoșani, Buzău, Iași and Vaslui counties, while *I. sintenisii* was recorded in five localities from Tulcea and Constanța counties. *I. brandzae* grows in xerophilous, mesophilous and slightly halophilous grasslands, while *I.* sintenisii is characteristic of steppe and forest-steppe habitats. The density of individuals of *I. sintenisii* varies from 5 to 40 individuals per 100 m², and the density of individuals of *I. brandzae* varies from 5 to 25 individuals per 100 m². The habitat of these species falls within various EUNIS habitat types, such as deciduous forests (T1), semi-desert areas with saline soils (R64), dry continental grasslands (R1B) and moist or mesotrophic to eutrophic grasslands (R36). The main threats to *I. brandzae* include overgrazing and the conversion of grasslands to farmland. The study's conclusions underline the urgent need for specific conservation measures to protect these species.

# DINAMICA ALIMENTARĂ ȘI ADAPTĂRILE ECONOMICE ALE COMUNITĂȚILOR PREISTORICE DIN VALEA MUREȘULUI: STUDIUL RESTURILOR FAUNISTICE ȘI AL FITOLITELOR DE LA ȘOIMUȘ-TELEGHI (JUD. HUNEDOARA)

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Comunitățile preistorice au pătruns în sud-vestul Transilvaniei și s-au stabilit în Valea Mureșului, unde au găsit terenuri propice pentru creșterea animalelor domestice și pentru agricultură. Acest studiu urmărește să răspundă la întrebări legate de dieta comunităților preistorice de la Șoimuș - punctul Teleghi, pentru aceasta recurgându-se la o abordare interdisciplinară care valorifică descoperirile arheozoologice și arheobotanice.

Materialul arheozoologic studiat este de origine menajeră și se încadrează cronologic între 6080 î.e.n. și 1020 î.e.n., fiind posibilă astfel obținerea de informații referitoare la dieta populațiilor din Neoliticul timpuriu (cultura Starčevo-Criș), Neoliticul dezvoltat (cultura Vinča), Epoca Bronzului mijlociu (cultura Wietenberg) și Epoca Bronzului târziu (orizonturile culturale Bădeni III-Deva și Susani-Simeria).

Creșterea animalelor reprezenta cea mai importantă activitate prin care se obținea proteina de origine animală, în toate eșantioanele studiate, animalele domestice fiind cele predominante.

Având în vedere numărul de fragmente faunistice identificate, de-a lungul preistoriei a existat o schimbare în timp a preferințelor alimentare a comunităților de la Șoimuș-Teleghi. Preferințele locuitorilor s-au schimbat treptat de la o creștere aproape exclusivă a cornutelor mari și mici în Neoliticul timpuriu la o alimentație bazată din ce în ce mai mult pe carnea de porc în detrimentul celei de oaie/capră în Bronzul mijlociu și prima fază a Bronzului târziu și de o revenire la dieta cu carne de oaie/capră în Bronz Timpuriu II.

Vânarea speciilor sălbatice în Neoliticul timpuriu nu pare să fi fost o activitate importantă, mamiferele sălbatice reprezentând aproximativ 7% din mamiferele identificate. Începând cu Neoliticul dezvoltat, vânătoarea ia amploare (14% mamifere sălbatice) și devine mai diversificată.

În ceea ce privește cultivarea plantelor, aceasta a putut fi evidențiată prin analiza fiolitelor. Microresturile de natură silicoasă atestă prezența cerelelor atât în Neolitic, cât și în Epoca Bronzului, ceea ce înseamnă că alimentația comunităților preistorice se baza și pe carbohidrați.

# DIACHRONIC APPROACH OF DENTAL MACROWEAR VARIATION IN ARCHAEOLOGICAL HUMAN POPULATIONS FROM NORTH-EASTERN ROMANIA - A PRELIMINARY STUDY

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Dental macrowear is the non-pathological loss of hard tissues, usually on the occlusal surface of the teeth. In archaeological contexts, the dental macrowear patterns can offer valuable insights especially for bioarchaeologists to correlate diet abrasiveness, food storage and processing techniques with the worn surfaces of the teeth. The aim of this study concerns to the diachronic comparative assessment of the dental wear of archaeological human mandibular second molars (M2) from Prehistory (5000–1200/1150 BCE) and Late Middle Ages (17th century CE) discovered in North-Eastern Romania. The degree of occlusal macrowear was assessed by the semiquantitative scoring system (Scott's method for recording occlusal molar wear), quantitative assessment on dentine exposure (image analysis) followed by statistical analysis. The scoring system showed that two grades of wear were identified in the analysed dental samples (i.e., moderately advanced wear and advanced wear). As assumed, the scoring system showed that a higher percentage of the analyzed mandibular molars are characterized by advanced wear, especially in the samples from Prehistory. When the sex criterium was considered, the male molars were more worn-out compared to female ones. All female molars from the 17th century CE were characterized by a moderate wear while only 63.6% of the female molars from Prehistory belong to the same wear category. The percentage of dentine exposure (PDE%) showed increasing values along the age-ranges. No statistical difference was obtained when the PDE was compared diachronically by sex within the same age at death category. Though dental wear is an age-dependent process, there are other factors that can affect the loss of dental tissue, especially in archaeological populations, including diet, food access and processing techniques, and ingestion of grit through food. More dental samples will be integrated in an overall study regarding the diet-related dental wear in the past human populations from Nord-Eastern Romania.

# PRELIMINARY ANALYSIS OF HUMAN REMAINS DISCOVERED IN THE 15TH-19TH CENTURY NECROPOLIS OF SF. ATANASIE CHURCH IN NICULIȚEL (TULCEA COUNTY, ROMANIA)

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This preliminary research focuses on the human remains recovered during archaeological excavations carried out in the necropolis of 15th-19th centuries, near the “Sf. Atanasie” Church from Niculițel (Tulcea County, Romania). The church was built at the beginning of the 14th century by a local ruler with the purpose of a familiar necropolis. Subsequently, the church underwent renovations during the 15th, 17th and 18th centuries serving a small rural community. Preventive archaeological research from 2022-2023 documented 348 burial tombs/funeral complexes covering the chronological interval of 15th-19th centuries. More than 500 human skeletons belonging to all age categories were discovered. The archaeological inventory includes various metal objects, jewellery, and clothing accessories. This anthropological study targets a rural Christian community from the Dobrogea region under Ottoman occupation.

To date, the human remains of 117 individuals have been studied, and they are presented in terms of age at death and sex estimations, osteometry, taphonomy, and pathologies. Of the total estimated individuals, 74 are adults and 43 children (*infans* I, and *infans* II). In adult category, 19 individuals have been identified as males, 11 females, and 44 as indeterminable. Skeletal material generally shows a poor degree of preservation. However, various taphonomic traces were evaluated, such as those left by rodents’ teeth, metal oxidation, and soil action. Bone pathologies are numerous in adult individuals, among which are deficiencies, inflammation, infections, fractures, etc. At the dentition level, they were found multiple caries, calculus, enamel hypoplasia (linear transversal type), microdontia, absence of teeth (partial and total edentation).

The research on this large skeletal sample will be continued, and the results will contribute to the knowledge of local and regional history with information such as the demographic structure, health status, daily occupations of the inhabitants.

# PRELIMINARY STUDY OF THE FAUNAL REMAINS RECOVERED FROM THE ARCHAEOLOGICAL SITE OF HELLENISTIC MEDGIDIA 3 (CONSTANȚA COUNTY, ROMANIA)

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The site Hellenistic Medgidia 3 was discovered in the fall of 2022, following an intrusive archaeological diagnosis generated by the Romcim company's investment and development plans. The land on which the investment was proposed is located on the SW side of the Medgidia quarry, in the outskirts of Poarta Alba commune, on the border between Poarta Alba UAT and Medgidia municipality. It is part of a complex of settlements, Hellenistic Medgidia 1-3, chronologically dated to the beginning of the second Iron Age (beginning of the 4th century – first half of the 3rd century BC), in Dobrogea known as the Hellenistic period. The determined area of the site has approximately 8 ha, of which 1 hectare has been surveyed. As a result of the research, 126 archaeological features were identified and documented. Until this stage of data processing, 2 sunken dwellings have been identified, 6 fire installations (furnaces) of which 2 are clearly related to a ceramic kiln, supply pits, household pits, a burial grave (inhumation), pillar pits and contemporary pits (irrigation ditches). The artefacts are those typical of a settlement – pottery, predominantly amphoric material, wall fragments, stone tools, metal pieces, and animal bones. The area that was subjected to research is on the western edge of the site.

The archaeozoological study started with the sample collected from the complex 29 representing a household pit, and it was carried out within the Archaeozoology Laboratory (Faculty of Biology, "Alexandru Ioan Cuza" University of Iași). The methods mainly consisted of anatomic and taxonomic identifications, age and sex estimations. A taphonomic evaluation was also carried out by detecting the traces of human activity (e.g., butchering, burning, processing), and the action of some carnivores. The quantification was based on the number of remains assigned to each taxon, and the estimation of the minimum number of individuals. The faunal assemblage includes remains of household origin, consisting of bone fragments, cornular processes, teeth. Burn marks were observed on three bones, and traces of butchering cuts were noted on six bones; one bone fragment showed traces left by the teeth of a carnivore, probably a dog from the settlement. Due to the high fragmentation of the bones and the fact that some are from immature individuals, few measurements were possible. The analysed sample has 85 remains from mammals, most of them domestic species, and few wild ones. The identified species are *Bos taurus* (cattle), *Ovis aries/Capra hircus* (sheep/goat), *Equus caballus* (horse), *Canis familiaris* (dog) and *Lepus europaeus* (hare). The 55 remains of cattle were attributed to one mature individual (over 2.5 years), and two immatures (one slaughtered at 12-18 months, and another at 18-24 months). The sheep/goat remains (20) come from two mature individuals (2-3 years old), one of which is a horned female. The five horse bone fragments were attributed to a mature individual, and it is assumed that the meat of this species was consumed. For dog, a mature individual was estimated, as well as for the only one wild species – the hare.

# CATTLE (*BOS TAURUS*) IN THE OLD IASI CITY (EAST ROMANIA) OVER HALF A MILLENNIUM (15TH-20TH CENTURIES), VIEWED FROM THE FAUNAL REMAINS DISCOVERED IN ARCHAEOLOGICAL SITES

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The archaeological research in the site Old Town Center-Princely Court in Iasi – Point “Ghica-Daniel House / St. Petersburg Hotel”, provided a large amount of faunal remains belonging to three chronological levels: 15th-16th centuries, 17th-18th centuries, and 19th-20th centuries. Thus, three archaeozoological samples were constituted for the study. Archaeozoological analysis consisted of anatomical and taxonomic identifications, quantification as number of identified remains (NISP), estimations of age and sex, and osteometry. The analyse of metric data on metapodials and horn cores aimed to evaluate the dimensional dynamic in cattle during the time. Based on the metapodial measurements, the sex and the withers height were estimated.

In all three chronological levels, the remains of mammals predominate, and within this category, cattle (*Bos taurus*) is the species with the largest frequency. The cattle female individuals are predominant compared to the castrated ones, in all three samples. Male individuals were estimated only in the sample of the 17th-18th centuries, and their number is smaller than of females.

For all three samples, the clustering of metric data on horn cores diagrams illustrates the predominance of "brachycerous" type, belonging to females. An increase in sizes of the horn cores is observed: the average value for the base circumference of the horn cores is 125.2 mm in the 15th-16th centuries, respectively 151.8 mm in the 17th-18th centuries, and reaches 165.5 mm in the 19th-20th centuries.

It is also to remark an increase of the maximum value of the wither’s height in cattle. For the 15th-16th centuries the maximum value in castrate individuals was 120.5 cm, for the following period the maximum limit was 128 cm, and for the 19th-20th centuries it riches 136.8 cm. The maximum value of this parameter in females is 120.3 cm for the 15th-16th centuries, 121.4 cm for the 17th - 18thcenturies, and 125.7 cm for the 19th-20th centuries.

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# FAUNAL REMAINS OF 17th-20th CENTURIES DISCOVERED IN THE ARCHAEOLOGICAL SITE ON THE ESPLANADE OF "VASILE ALECSANDRI" NATIONAL THEATER, IN IAŞI CITY (EASTERN ROMANIA)

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This paper presents an anatomical-comparative study of faunal remains found on the Esplanade of the National Theater "Vasile Alecsandri" in Iași, dating from the 17th to the 20th centuries. The archaeological research conducted in 2022 recovered a variety of artifacts as well as animal skeletal remains. To date, the archaeozoological analysis has focused on a sample of 411 faunal remains, categorized into two animal classes: mammals (403 remains) and birds (8 remains). The analysis reveals a predominance of domestic mammals, with cattle (*Bos taurus*) being the most common, followed by pig (*Sus domesticus*), sheep/goat (*Ovis aries/Capra hircus*), horse (*Equus caballus*), and dog (*Canis familiaris*). The bird remains mainly consist of turkey (*Meleagris gallopavo*) and chicken (*Gallus domesticus*).

# EVALUAREA RESURSELOR ANIMALE IN AŞEZARI DIN PERIOADA SECOLELOR IV-VI D.HR. SITUATE IN TERITORIUL CUPRINS INTRE DUNARE SI MAREA NEAGRA: DATE ARHEOZOOLOGICE

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Materialul faunistic ce a stat la baza studiului nostru provine din situl arheologic de la Ibida, colectat în urma săpăturilor efectuate în anul 2021. Pentru comparații am luat în studiu eșantioanele de la Niculițel, Telița-Amza și Horia.
Eșantionul arheozoologic de la Ibida este constituit din resturi de origine menajeră, și au fost identificate fragmente provenite de la pești, păsări și mamifere. În primele două grupe taxonomice menționate a fost repartizat un număr redus de fragmente osoase, în timp ce majoritatea aparțin mamiferelor. Au fost identificate resturi de la mamifere domestice (care sunt predominante), cât și de la mamifere sălbatice. Speciile de mamifere identificate sunt:
*Bos taurus* (bovina domestică), *Ovis aries* (oaia), *Capra hircus* (capra), *Equus caballus* (calul), *Canis familiaris* (cîinele), *Felis catus* (pisica), *Sus domesticus* (porcul), *Cervus elaphus* (cerbul), *Capreolus capreolus* (căpriorul), *Sus scrofa* (mistrețul), *Canis lupus* (lupul).
Vânătoarea și pescuitul aveau un rol secundar în economia alimentară a locuitorilor din așezările studiate. Creșterea animalelor avea o importanță majoră pentru locuitorii așezării de la Ibida, cât și pentru celelalte așezări luate în studiu.

## *BIOLOGIE EXPERIMENTALĂ ȘI MOLECULARĂ*

## SECȚIA: *GENERAL 2*

## COMUNICĂRI ORALE

### EFFECTS OF 6-HYDROXY-L-NICOTINE ON MEMORY FORMATION IN 5XFAD ALZHEIMER'S MOUSE

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6-hydroxy-L-nicotine (6HLN) is a nicotinic derivative from the nicotine metabolism within *Paenarthrobacter nicotinovorans* that possess cognitive-improving abilities and antioxidant properties, eluding the side-effects of nicotine, the parent molecule. The present study examined the effects of 6HLN on cognitive impairments in 5XFAD transgenic mice with five familial Alzheimer's disease (AD) mutations. 6HLN (0.3 mg/kg and 0.6 mg/kg, b.w., i.p.) was administered daily to 5XFAD mice for 7 days and 30 min before behavioral testing. Cognitive function was evaluated using Y-maze and radial arm maze tests, while anxiety-depressive-like behaviors were assessed by elevated plus maze and forced swimming tests. To elucidate the possible mechanism underlying the memory improving effects of 6HLN in 5XFAD mice, Aβ1-42 and DNA fragmentation levels in mice hippocampus were evaluated. Vehicle-treated 5XFAD mice exhibited hippocampus-dependent memory deficits as compared with non-transgenic mice, which were reversed in 6HLN-treated 5XFAD mice. In addition, reduced hippocampal Aβ1-42 and DNA fragmentation levels in 6HLN-treated 5XFAD mice compared to non-transgenic mice were noticed, indicating the positive effects of 6HLN on cognitive function. Collectively, findings from this study support the positive impact of 6HLN against AD.

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# PROMNESIC, ANXIOLYTIC, AND ANTIOXIDANT EFFECTS OF THREE NATURAL BIOACTIVE COMPOUNDS IN THE OKADAIC ACID-INDUCED ZEBRAFISH MODEL OF ALZHEIMER'S DISEASE

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Alzheimer's disease (AD) is the most common type of dementia, characterized by memory impairments, elevated oxidative stress levels in the brain, and anxiety. As the global population continues to age, AD is emerging as a growing public health issue, highlighting the urgent need for innovative treatments. Mansorin A (MA), mansonone G (MG), and 6-paradol (PD) are three plant-derived phenolic ketones with good oral bioavailability, drug-like properties, and the ability to cross the blood-brain barrier. Their potential in treating AD was investigated using a novel okadaic acid (OKA)-induced zebrafish model of AD. The animal model was created by immersing the animals in OKA (10 nM) for four days, after which MA, MG, and PD were chronically administered via immersion at concentrations of 1, 3, and 6 µg/L. To assess short-term memory in the experimental groups, the Y-maze and Novel Object Recognition tasks were employed, while anxiety-like behavior was examined through the Novel Tank and Novel Object Approach tests. Subsequently, a series of biochemical analyses were conducted to assess the activity of antioxidant markers such as catalase, superoxide dismutase, reduced glutathione, malondialdehyde, carbonylated proteins, and glutathione peroxidase. The results demonstrate the promnesic, anxiolytic, and antioxidant effects of MA, MG, and PD in the animal model, particularly at concentrations of 3 and 6 µg/L. In conclusion, this study highlights three promising treatments for AD while providing new insights into the OKA-induced zebrafish model of AD.

# IMPACT OF 3D-PRINTED MOLECULAR MODELS ON TEACHING PROTEIN AND DNA STRUCTURE

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The structure-to-function relationship is the hallmark of biochemistry and molecular biology. Although very useful and convenient, the two-dimensional structural formulae that students usually first encounter in the chemistry class are not able to picture the complexity of macromolecular structures such as proteins and nucleic acids. For this, animations, movies, and virtual reality are much better suited. Still, touching and handling physical models of molecules should allow students to better overcome the problems associated with the translation of 2D formulae into 3D space. Object-based learning stands out as an approach that gives students a tangible way to view and manipulate physical structures in three dimensions, strengthening learning by providing a more complete sensorial experience and challenging students to engage with and interrogate the object. A compensatory research design was employed to test this hypothesis.

Second-year bachelor students enrolled in the Molecular Biology class were randomly allocated to two groups. Both groups independently attended two lectures and were alternatively control and intervention groups. In the control group, only animations and drawings were used while in the intervention group, the same animations and drawings were replaced by 3D printed molecular models of various amino acids and nucleotides, peptides, a-helices, b-sheets, proteins and DNA in various representations [1]. Models were used by the educator in front of the class but also handed to the students who were given time to interact with the models. Before and after each lecture, both groups received the same pre- and post-test consisting of a total of 23 questions evaluating key biomolecular visualization learning goals [2]. At the end of the experiment, the students were asked to fill in an anonymous feedback form.

Presenting the physical molecular models in the class and allowing students 3-5 minutes to handle them individually or in small groups was shown to be enough to convert low gain lectures (mean gind around 0.2) into medium gain lectures (mean gind around 0.4). The physical models were received by students as being helpful because it allowed them to better focus, to engage the visual memory and because it provide a hands-on advantage. Despite some identified drawbacks, the usage of physical models of molecules fabricated using 3D printing is a great way of improving bio-molecular education with low costs, including in low-income countries where teaching materials are scarce.

3D printed molecular models have been integrated into two lectures dealing with DNA and protein structure. The impact of the models on students' ability of overcome some common misunderstandings related to proteins and DNA structures was evaluated in a randomized controlled experiment. The current work contributes to the body of empirical evidence that support the use of 3D representations in teaching and learning biochemistry concepts.

# STUDII GENETICE ȘI BIOCHIMICE ÎN AFECȚIUNEA NEURODEGENERATIVĂ ALZHEIMER

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Încadrată în spectrul larg al afecțiunilor neurodegenerative, BA este cunoscută prin heterogenitatea ipotezelor și multiplele mutații genetice, modificări epigenetice și biochimice, prin evoluția de la stadii incipiente caracterizate prin deficite de stocare și codificare a informațiilor, până la declin cognitiv, funcțional și comportamental progresiv.
Studiul retrospectiv cuprinde persoanele internate la secția de Neurologie a Spitalului de Urgență Militar „Iacob Czihac” Iași în intervalul 01.01.2022-31.12.2023. Din efectivul de 2277 pacienți cu boli neurologice cronice, 219 au fost diagnosticați cu BA în diverse stadii. Au fost selecționate 43 de cazuri la care s-a manifestat predispoziția genetică(19,6347%), fiind analizate pe baza dosarelor medicale.
Deși majoritatea nu prezintă antecedente heredocolaterale(80,3652%), bolile predispozante(DZ2, hipercolesterolemia, HLP,HTA,TCC, obezitatea), factorii de mediu(alcoolul, pesticidele, fumatul, aluminiul, solvenții organici), stresul și mediul de proveniență joacă roluri fundamentale în determinism. Se constată că persoanele în categoria de vârstă 60-70 de ani(71,2328%), din mediile urbane(63,0136%), mai ales de sex feminin(63,4703%), au o probabilitate mai crescută, fiindu-le recomandate evaluările timpurii. Prevalența transmiterii pe linie maternă a fost de 58,1395%, în timp ce BA pe linie paternă s-a manifestat la 32,5581% dintre pacienți, numai 4 cazuri având antecedente pe ambele linii (9,3023%).
Cohorta suplimentară inclusă în acest studiu denotă prezența unei curbe bimodale, pacienții de sex masculin ajungând să fie internați pe secțiile Spitalului de Psihiatrie Cronici (Dumbrăveni) în stadii avansate cu tulburări comportamentale timpuriu, manifestând o complianță scăzută în procesul de respectare a recomandărilor terapeutice.
Caracterizată fără echivoc printr-o etiologie vastă, prin atrofie cerebrală, disfuncții mitocondriale, acumularea plăcilor senile și agregatelor neurofibrilare în urma mutațiilor autosomale-dominante(APP,PSEN1,PSEN2) sau aparițiilor unor variante alelice (APOE4,SORT1,MAPT,APOJ), Alzheimerul este o boală multifactorială rezultată în urma interacțiunii bilaterale mediu-ereditate sau numai a unuia, trecerea de la stadiul de vulnerabilitate la cel de afecțiune propriu-zisă realizându-se însă prin coroborarea permanentă a celor două clase mari de factori.

# UTILIZAREA SEMINȚELOR DE CANEPA IN DIETA CRAPULUI (*CYPRINUS CARPIO*) IMBUNATAȚEȘTE CREȘTEREA ȘI STATUSUL OXIDATIV

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Acvacultura reprezintă una dintre cele mai importante ramuri ale agriculturii, contribuind semnificativ la asigurarea securității alimentare globale. Îmbunătățirea furajelor este esențială pentru creșterea eficienței producției și pentru menținerea sănătății peștilor. Scopul acestui studiu a fost evaluarea efectului semințelor de cânepă asupra creșterii și statusului oxidativ al crapului (*Cyprinus carpio*). Au fost testate patru diete cu conținut variat de semințe de cânepă (0%, 10%, 20% și 30%) pe crap de vară întâi, într-un sistem de acvacultură recirculantă, analizând parametrii de creștere, microbiota intestinală, statusul oxidativ și compoziția biochimică a cărnii. Durata studiului a fost de șapte săptămâni. Rezultatele au arătat că dietele cu cânepă au determinat o creștere semnificativă a indicilor de creștere în greutate, profil și rata relativă de creștere, în timp ce factorul de conversie a furajului și eficiența utilizării proteinelor au fost semnificativ reduse comparativ cu dieta martor. În plus, dietele cu cânepă au redus numărul de microorganisme intestinale și au îmbunătățit statusul fiziologic al peștilor. Analiza biochimică a cărnii nu a evidențiat modificări semnificative între dieta control și cele cu cânepă. Utilizarea semințelor de cânepă în dieta crapului poate reprezenta o strategie eficientă pentru îmbunătățirea performanțelor de creștere și a stării de sănătate, fără a afecta compoziția biochimică a cărnii.

## *BIOLOGIE EXPERIMENTALĂ ȘI MOLECULARĂ*

## SECȚIA: *GENERAL 2*

## POSTERE

### PRELIMINARY STUDY AND MOLECULAR CONFIRMATION OF *MACROBRACHIUM NIPPONENSE* IN THE DANUBE DELTA

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The present study investigates the origin of the invasive freshwater shrimp, *Macrobrachium nipponense*, in the Romanian Danube Delta. Unlike other regions where this species has been documented, its accidental introduction to Romania is likely due to its presence in neighboring countries.
Macromorphological analysis, based on the significantly larger second pair of pereiopods in adult males, has confirmed the species' classification within the *Macrobrachium* genus. To determine the exact origin of this invasive shrimp, a combination of morphological comparison and DNA sequencing will be employed.
For this study, 18 individuals were collected from the southern region of the Danube Delta and preserved in absolute ethanol. Phylogenetic analysis of these samples suggests that the genetic diversity observed in the lower Danube basin may have originated from Henan Province, China. This diversification process is likely attributable to favorable environmental conditions in recent years, as evidenced by the similarity between the genetic variants found in these two regions.

# *IN VITRO* GERMINATION OF *ANGRAECUM CALCEOLUS*: A STUDY ON CULTURE MEDIA EFFICIENCY

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*Angraecum calceolus* Thours is a small orchid species with a limited geographical distribution in Madagascar, Mozambique and the Comoros, Mascarene, and Seychelles Islands. It is found in forests located at altitudes between 100 and 1400 meters, in areas with moderate rainfall. It can be lithophyte or epiphyte, having a fast growth. In vitro germination of orchid seeds is a complex process, due to the existing symbioses in these plants. There is an advantage of obtaining a large number of individuals in a short time, by using the in vitro culture of this species, compared to the vegetative propagation, which requires several years.

The seeds used in the study were obtained in 2024 from the exchange of plant material that ”A. Borza” Botanic Garden is having with the Bratislava Botanic Garden. The main purpose of the study was to test the in vitro germination of *Angraecum calceolus* seeds on eight variants of culture medium, such as: MS with vitamins (V1), MS basal salt (V2), ½ MS with vitamins (V3), and ½ MS basal salt (V4). In some cases, 1 g/l activated charcoal was added. The seeds were sterilized inside the capsule, afterwards being opened in sterile distilled water, and the resulting solution inoculated on the culture medium.

The seed sterilization efficiency was 57.82% and the germination efficiency was 24.32%. The first signs of germination were observed on V1 and V3 media, after 30 days, and no germination on activated carbon media. The highest germination percentage was 44.44% on V1 medium, followed by 33.33% on V3 and 11.11% on V2 and V4. After germination, the plants were transferred to multiplication media, and after 60 days, those with more than three leaves were acclimated in vitrovent boxes, in order to be transferred to the greenhouse for final acclimation.

# ADAPTATION OF *MEDICAGO SATIVA* TO HEAT STRESS: MORPHO-ANATOMICAL, BIOCHEMICAL AND GENETIC RESPONSES DURING SYMBIOTIC NITROGEN FIXATION

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Symbiotic nitrogen fixation (SNF) is crucial for sustainable agriculture due to its role in enhancing plant growth and nutrition. Leguminous plants, which are key contributors to agricultural productivity, often face challenges from abiotic stresses. Thermal stress disrupts metabolic processes and impairs the ability of rhizobium to fix nitrogen symbiotically, thereby limiting plant growth and development in many regions. This study aims to evaluate the response of alfalfa (*Medicago sativa* L.) to temperature stress during symbiotic nitrogen fixation. Experiments were conducted on temperature-resistant alfalfa plants, either uninoculated or inoculated with indigenous *Ensifer meliloti* strains, and subjected to thermal stress for 14 days. The selected RMCC strains, known for their high nitrogen fixation capacity, exhibit diverse phenotypic traits. Control and stressed plants were collected once phenotypic changes became evident, and their morphological traits were assessed. In addition to growth analyses, various morpho-anatomical and biochemical parameters were measured to evaluate the plant's response to enhanced temperatures. The observed morpho-anatomical changes were closely related to seedling height, the appearance of the first pair of true leaves, the thickness of the bark, and the central cylinder at the hypocotyl level, as well as alterations in leaf morphology. Notably, leaf thickness increased with rising temperature. Our data indicated that moderate heat stress (35 oC) also led to increased antioxidant enzyme activity in alfalfa. Furthermore, RT-qPCR transcriptomic analysis was conducted to examine heat-induced changes in gene expression related to oxidative stress pathways (CAT, Cu/Zn SOD) and nitrogen assimilation (GS, GOGAT, AAT). This combined analysis offers new insights into the mechanisms by which nitrogen-fixing legume crops adapt to and tolerate thermal stress, with significant implications for leguminous plant cultivation under adverse environmental conditions.

# PURIFICAREA TRANSGLUTAMINAZEI MICROBIENE PRODUSĂ DE *STREPTOMYCES MOBARAENSIS* ATCC 27441 FOLOSIND RĂȘINI SCHIMBĂTOARE DE IONI

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Transglutaminaza microbiană (mTG) poate cataliza legături covalente între proteine, proprietate pe baza căreia este utilizată în industria alimentară pentru restructurarea cărnii, îmbunătățirea texturii produselor lactate și prelungirea termenului de valabilitate al alimentelor. mTG a fost obținută folosind tulpina Streptomyces mobaraensis ATCC 27441 și purificată folosind diverse rășini schimbătoare de ioni, precum: Amberlite CG-50, Resindion SP 825L, Relisorb și Flactogel EMD SO3-. Activitatea enzimatică a fost monitorizată folosind o metodă spectrofotometrică. Rezultatele obținute arată că utilizarea rășinii Flactogel EMD SO3- a dus la înregistrarea celui mai ridicat randament în procesul de purificare (84,23%), recuperându-se o activitate enzimatică de 1613,83 U. Utilizând Relisorb, a fost evidențiată o activitate enzimatică totală de 882,07 U și un randament de 46,04%, iar în cazul Amberlite CG-50 s-a atins o activitate totală de 869,558 U, cu un randament final de 45,38%. Cel mai redus randament final a fost înregistrat în cazul rășinii Resindion SP 825L - 5,08%, cu înregistrarea unei activități enzimatice de 97,420 U. Rezultatele indică faptul că Flactogel EMD SO3- este cea mai eficientă rășină pentru purificarea mTG, oferind o abordare robustă pentru obținerea unei enzime de înaltă puritate, adecvată aplicațiilor industriale.

# INDICELE ATEROGEN AL PLASMEI (AIP): INDICATOR AL DISFUNCȚIEI ENDOTELIALE ȘI RISCULUI CARDIOVASCULAR LA ȘOBOLANI OBEZI

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Scopul nostru a fost să determinăm relația și impactul disfuncției endoteliale histologice timpurii asupra indicelui aterogen al plasmei, utilizând un model experimental pe șobolani obezi.
Douăzeci și unu de șobolani masculi din rasa Wistar, cu o greutate cuprinsă între 450 și 550 grame (lot obezitate), 150 si 200 grame (lot control) și o vârstă de 4-6 luni, au fost împărțiți în trei loturi: animalele din lotul I (control) au primit hrană standard și apă ad libitum, loturile II și III au fost hrănite cu o dietă bogată în grăsimi (HFD) ce conținea 2% colesterol, timp de 20 de zile. Lotul experimental (lotul III) a fost tratat separat cu Atorvastatină, 20 mg/kg/zi, zilnic, pentru următoarele 20 de zile, prin gavaj, având apă ad libitum. Glicemia și profilul lipidic seric au fost evaluate atât înainte, cât și după administrarea orală a dietei și terapiei timp de patru săptămâni. Pentru evaluarea Indicelui Aterogen al Plasmei (AIP), indicatorilor de risc Castelli (I și II) și indicilor combinați ai lipoproteinelor (LCI) a fost folosită o formulă specifică. Aortele au fost, de asemenea, prelevate pentru analiza histologică, iar principalii constituenți ai matricei extracelulare, în special colagenul și elastina, au fost observați la microscop pentru semne de degenerare aortică. Disfuncția endotelială a fost evaluată prin ecografie abdominală, analiză histologică și prin măsurarea biochimică a profilului lipidic.
După 4 săptămâni de HFD s-a observat o creștere a nivelurilor serice de lipide; valorile AIP sugerează un risc ridicat de evenimente cardiovasculare. Din punct de vedere histologic, am observat leziuni endoteliale și modificări degenerative în media aortei, indicate de disocierea fibrelor elastice și acumularea de colagen.
Am identificat o corelație între leziunile endoteliale și AIP, indicele combinat al lipoproteinelor, precum și indicii de risc Castelli I și II. În modelele experimentale de obezitate la șobolani, obezitatea modifică profilul lipidic, crește AIP și poate spori riscul de deteriorare endotelială. Funcția endotelială și stadiile incipiente ale aterosclerozei pot fi îmbunătățite prin tratamentul cu statine, o dietă echilibrată și modificarea factorilor de risc care pot fi controlați.

# ALZHEIMER (AD): A MULTIFACTORIAL NEURODEGENERATIVE DISEASE

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Situated within the broad spectrum of neurodegenerative disorders, AD is known for its complexity, heterogeneity, multiple genetic mutations, epigenetic and biochemical modifications, and irreversible evolution from early stages characterized by deficits in the ability to encode and store new information to subsequent progressive cognitive, functional, behavioral decline.
The aim of the conducted study was to compile conclusive statistics, identify genetic factors and correlate them with environmental ones, thus highlighting the importance of developing evaluation programs and early introduction of medication, in order to decelerate the progression of neurodegenerative processes.
The retrospective study encompassed individuals admitted to the Neurology Department of "Iacob Czihac" Military Emergency Hospital Iași between 01.01.2022 and 31.12.2023. Out of 2277 patients hospitalized with chronic neurological diseases, 219 were diagnosed with AD in various stages. Forty-three cases exhibiting genetic predisposition (19,6347%) were selected and thoroughly analyzed based on medical records.
The study emphasizes the significant position of AD among chronic neurological diseases. Although the majority do not present hereditary antecedents(80,3652%), predisposing diseases(T2D,hypercholesterolemia,hypertension,TBI,obesity), environmental factors (alcohol, pesticides, smoking, aluminium, organic solvents), stress, as well as the region of residence, play fundamental roles in the determinism. It is observed that individuals in the 60-70 age category(71,2328%) from urban areas(63,0136%), especially females(63,4703%), have a higher probability of developing AD. Maternally transmitted Alzheimer's prevalence was 58,1395%, while paternally inherited AD accounted for 32,5581%, with only 4 cases having antecedents on both lines(9,3023%).
Unequivocally characterized by a vast etiology, cerebral atrophy, neurotrophin depletion, mitochondrial dysfunction, accumulation of senile plaques and neurofibrillary tangles following dominant autosomal mutations(APP,PSEN1/2) or the appearance of allelic variants(APOE4,SORT1,MAPT,APOJ), AD is a multifactorial disorder resulting from the bilateral interaction between genetic and environmental factors or solely one of them. However, the transition from vulnerability to the actual disease is achieved through the continuous corroboration of these two major classes of factors.

# IN SILICO COMPARATIVE ANALYSIS OF PHYTOCHEMICALS FROM *RUBUS FRUTICOSUS* WITH RELEVANCE FOR NEURODEGENERATIVE DISEASE

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This study focuses on an in silico comparative and descriptive analysis of the phytochemical compounds in *Rubus fruticosus* (blackberry) using the computational tool SwissADME, with an emphasis on their potential applicability to neurodegenerative diseases such as Alzheimer's disease (AD). SwissADME enables the prediction of comprehensive pharmacokinetic profiles, including gastrointestinal absorption (HIA), blood-brain barrier (BBB) permeability via the BOILED-Egg model, and drug likeness. Moreover, this study evaluates the probability of these compounds being actively effluxed by P-gp (PGP+), which is crucial for assessing their bioavailability and potential therapeutic effectiveness in the central nervous system. The interaction of phytochemicals with P-gp can significantly influence their ability to penetrate the BBB, with higher efflux probabilities indicating reduced central nervous system accessibility. Additionally, similarities and differences between these compounds are highlighted to assess their therapeutic potential.

Using SwissTargetPrediction and SwissDock, the study further evaluates the interaction of these phytochemicals with crucial enzymes and molecular targets involved in neurodegeneration, such as: β-secretase and acetylcholinesterase (implicated in amyloid plaque formation and cholinergic signaling), kinases like GSK3β, CDK5, and ERK2 (involved in tau protein hyperphosphorylation and neurodegeneration), β-amyloid protein and microtubule-associated protein tau (amyloid plaques and NFTs - critical in AD pathology).

Key bioactive compounds from *Rubus fruticosus*—noted for their antioxidant, anti-inflammatory, and neuroprotective effects—are compared against established AD treatments, including galantamine and rivastigmine.

This comparative analysis underscores the potential of *Rubus fruticosus* phytochemicals as viable candidates for developing treatments for neurodegenerative diseases, with the potential to enhance cognitive function and delay or slow disease progression in conditions like AD. By integrating computational methods, this research seeks to facilitate the discovery and development of new drug from natural sources, like *Rubus fruticosus*, while emphasizing the necessity of experimental validation to confirm the bioinformatic predictions.

# EFECTUL NEUROPROTECTOR AL CANABINOIZILOR ASUPRA NEURONILOR ÎN CONTEXTUL TRATAMENTULUI CU PACLITAXEL: UN STUDIU *IN VITRO* ASUPRA CREȘTERII NEURITELOR

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Neuropatia periferică indusă prin administrarea de chimioterapice (CIPN) este un efect secundar comun pentru aproximativ 30-40% dintre pacienții care urmează chimioterapie neurotoxică, Paclitaxelul (PTX) fiind responsabil pentru peste 70% din aceste cazuri. Studii anterioare au arătat că, canabinoizii ar putea ameliora simptomele CIPN. Prin urmare, s-au testat mai mulți canabinoizi naturali și sintetici care ar putea fi utilizați pentru tratarea neuropatiei periferice induse de Paclitaxel, folosind un model neural in vitro.

Ganglionii rădăcinilor dorsale (DRG) de la șoareci CD-1 adulți sănătoși au fost recoltați și supuși mai multor reacții enzimatice, urmate de izolarea neuronilor utilizând un gradient de concentrație. Neuronii au fost ulterior tratați cu o soluție de PTX și diverși canabinoizi, apoi monitorizați timp de 72 de ore. Aceiași neuroni au fost fotografiați la microscop la intervale de timp prestabilite, pentru a cuantifica lungimea axonilor. Imaginile obținute au fost analizate folosind software-ul ImageJ, iar datele rezultate au fost supuse analizei statistice.

Co-administrarea canabinoizilor cu Paclitaxel a demonstrat un efect pozitiv, dependent de concentrație și timp, în reducerea scurtării axonilor, comparativ cu monoterapia chimioterapică (PTX). Reducerea efectelor toxice induse de PTX asupra neuritelor neuronilor, determinată de administrarea canabinoizilor, a fost observată la toate concentrațiile și intervalele de timp testate, însă cu nivele diferite de eficacitate. Efectul neuroprotector observat este semnificativ din punct de vedere statistic, sugerând un impact relevant pentru diminuarea neuropatiei periferice induse de chimioterapice.

Studiul s-a concentrat pe evaluarea influenței mai multor canabinoizi naturali și sintetici asupra morfologiei neuronale în condițiile efectelor toxice ale administării de PTX. Rezultatele noastre pun în evidență efectul protector al canabinoizilor selectați asupra neuronilor din ganglionii dorsali tratați cu Paclitaxel. Prin urmare, aceste tipuri de compuși ar putea fi candidați potențiali pentru tratamentul neuropatiei periferice induse de Paclitaxel. În final, aceste rezultate preliminare vor constitui baza unor studii suplimentare in vitro și in vivo, pentru a demonstra pe deplin ipoteza propusă.

Bibliografie: Creanga-Murariu I, Filipiuc LE, Gogu M-R, Ciorpac M, Cumpat CM, Tamba B-I, Alexa-Stratulat T (2024). The potential neuroprotective effects of cannabinoids against paclitaxel-induced peripheral neuropathy: in vitro study on neurite outgrowth. Frontiers in Pharmacology, 15, 1395951.

## ANTIBIOFILM ACTIVITY OF BrCl-FLAV AGAINST *ACINETOBACTER PITTII*

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Bacterial biofilms are specific structures that make sessile cells up to 1000 times more resistant to antibiotics than planktonic cells, playing a particularly important role in antibiotic resistance. The formation of biofilms involves several steps, including the irreversible attachment of microbial cells to a particular substrate, growth and micro-colonies formation and detachment of cells from the biofilm. Once established, mature biofilms are difficult to eradicate. Therefore, the identification of antimicrobial compounds that prevent either the adhesion and formation of bacterial biofilms or their maturation is a priority in the scientific community.

In this context, the aim of the present study was to evaluate the activity of synthetic flavonoid BrCl-flav on the formation of biofilm by resistant *Acinetobacter pittii* strain. Cristal violet staining was used to assess adhesion, formation, and biofilm maturation in the presence of different concentrations of BrCl-flav. The effect of synthetic flavonoid on biofilm inhibition was also evaluated using scanning electron microscopy. Tetrazolium salt (MTT) was used to evaluate the metabolic activity of *A. pittii* cells withing the treated biofilm.

Our data have shown that BrCl-flav inhibited adhesion and biofilm formation at sub-inhibitory concentrations up to 80% compared to control. Moreover, the metabolic activity of bacterial cells was reduced by 95%. The mature biofilm produced by *A. pittii* was also eradicated by BrCl-flav. The results suggest that synthetic compound BrCl-flav has a significant potential as a novel antibiofilm agent against *Acinetobacter* biofilm.

# A NEW CLASS OF TRICYCLIC FLAVONOIDS WITH ANTIMICROBIAL ACTIVITY

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Antibiotic resistance is one of the greatest threats to human health. It is estimated that antibiotic resistance was responsible for 1.27 million deaths worldwide in 2019 (WHO). Due to the worldwide problem of antibiotic resistance, the identification of new antimicrobial agents is a priority for the scientific community. In this context, a new series of tricyclic flavonoids with a methyl substituent on ring A of the flavonoid skeleton was synthesized to determine their antimicrobial properties. Antimicrobial activity was identified by determining the minimum inhibitory concentration and the minimum bactericidal/fungicidal concentration. Growth kinetic and time-kill assay was used to confirm antibacterial efficacy. Fluorescence microscopy was used to investigate the mechanisms of action. Our results suggest that the tricyclic flavonoids have shown very good antimicrobial activities, with MIC and MBC values as low as 1.95 µg/mL and 3.90 µg/mL recorded for compound 5e against a multidrug-resistant MRSA strain. In the presence of compound 5e, no viable cells were detected after 6 hours of incubation and a total kill effect was observed up to 24 hours. Investigations showed that *S. aureus* MRSA cells lose their membrane integrity in the presence of compound 5e. Our results suggest that compound 5e has significant anti-MRSA activity, but further investigation is necessary.

# A MULTIOMIC STUDY OF NICOTINE CATABOLISM IN *PAENARTHROBACTER NICOTINOVORANS* ATCC 49919

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*Paenarthrobacter nicotinovorans* ATCC 49919 utilizes the pyridine pathway encoded by the pAO1 megaplasmid to degrade toxic nicotine, converting it into non-toxic compounds with economic potential. This strain holds promise as a biological agent for nicotine decontamination in waste or polluted environments. However, limited knowledge exists regarding the interactions between the metabolic pathways encoded by the chromosome and the pAO1 megaplasmid. Moreover, there is no experimental evidence for the expression of half of the 40 nic genes encoded by the megaplasmid. To advance our understanding of nicotine degradation and to foster the biotechnological applications of *P. nicotinovorans* ATCC 49919, we aimed to integrate and supplement the available data through a multiomic approach. *P. nicotinovorans* ATCC 49919 was cultured on citrate medium with and without nicotine. Three critical time points in nicotine degradation were established using HPLC, corresponding to the onset, slowdown, and cessation of nicotine catabolism. Replicate samples were taken and total RNA was extracted and used to create libraries for direct long-read sequencing. The transcriptomic data was processed and integrated with a previously available proteomic dataset, which was reinterpreted using the newly available complete genome of the strain. This allowed the identification of differentially expressed genes and enriched pathways in response to nicotine at each key stage of nicotine catabolism. This study represents the first multiomic analysis of a microorganism which degrades nicotine via the pyridine pathway. Gene-set and pathway enrichment analyses indicated that the most differentially expressed genes in nicotine-treated cells were involved in transport, growth, metabolism, and resistance to oxidative and osmotic stress induced by nicotine and its by-products. The data supported a prior hypothesis from the proteomic analysis, suggesting that the final products of nicotine degradation feed into the citrate cycle, with the nicotine catabolic pathway acting as an anaplerotic process in *P. nicotinovorans* ATCC 49919.

# CONVERTING OPTICAL DENSITIES INTO CFUS – A CASE STUDY USING *PAENARTHROBACTER NICOTINOVORANS* ATCC 49919

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*Paenarthrobacter nicotinovorans* ATCC 49919 is a soil bacterium known for its nicotine metabolism via the pyridine pathway, which also produces a characteristic blue pigment. This pathway, encoded on a megaplasmid, is of interest for synthesizing green chemicals such as 6-hydrohy-L-nicotine. Efforts are underway to enhance its yield through genetic engineering. Accurate estimation of colony-forming units (CFUs) is essential for this work. Standard methods rely on optical density (OD) measurements and generalized conversion factors derived from *E. coli*, which are often inaccurate for organisms with unique growth profiles, such as *P. nicotinovorans*.
This study aimed to develop OD-to-CFU conversion factors tailored specifically to *P. nicotinovorans*. OD measurements at three wavelengths were taken during different growth phases, and colony counting was performed. Results showed that accurate CFU estimates from OD readings are only possible during the logarithmic phase, with calibration curves yielding R^2 values over 0.9. A formula for CFU estimation was proposed, but for the lag and stationary phases, plate counting remains the most reliable method. These conversion factors are phase-specific, applicable only during the log phase.

# OPTIMIZATION OF A BIOTRANSFORMATION ASSAY FOR THE CONVERSION OF NICOTINE TO 6-HYDROXY-L-NICOTINE BY *PAENARTHROBACTER NICOTINOVORANS* NCAIM P(B) 001499

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6-Hydroxy-L-nicotine (6HLN), a metabolite in the nicotine degradation pathway of *Paenarthrobacter nicotinovorans* pAO1 ATCC 49919, is known for its neuroprotective effects, including improving memory and reducing oxidative stress. However, 6HLN is further converted into 6-hydroxy-pseudooxynicotin. To increase the production of 6HLN, this study aims to use the strain *Paenarthrobacter nicotinovorans* NCAIM P(B) 001499, which overexpresses nicotine dehydrogenase (NDH) and ZnSO4 as a chemical inhibitor for 6-hydroxy-L-nicotinine oxidase (6HLNO). This strain, derived from *P. nicotinovorans* pAO1 ATCC 49919, was used to accomplish these aims. We aim to develop a biocatalytic system similar to those used in Pseudomonas sp. HZN6 and *Agrobacterium tumefaciens* S33, thereby enhancing 6HLN production.

Strains *P. nicotinovorans* pAO1 ATCC 49919 wild-type and *P. nicotinovorans* NCAIM P(B) 001499 were cultured in nicotine citrate medium at 28°C for 12 h. Cells in the log phase were harvested, washed and resuspended with sterile distilled water (1 ml : 1 g cells). The biotransformation assay was performed by incubating nicotine-induced cells with 3 mM nicotine at 28°C for 7 hours. At regular intervals 1 ml of supernatant is collected and HPLC analysis on a Shimadzu Prominence UPLC system equipped with a RP-18e 150-4.6 mm HPLC column (Chromolith HighResolution Sorbet Lot/Column No. U1141/010). The mobile phase was a mixture of 1 mM H2SO4: methanol (90:10 v/v) at a flow rate of 1 ml/min. The separation was performed at 30°C using isocratic elution and 6HLN levels were monitored at 290 nm.

Testing 0.2 to 5 grams of the wild-type showed that higher biocatalyst amounts increased 6HLN accumulation but also led to faster consumption of both nicotine and 6HLN, with depletion occurring after 250 minutes. In contrast, cells of the *P. nicotinovorans* strain NCAIM P(B) 001499 consumed nicotine more rapidly while allowing 6HLN to persist longer, especially with 0.5 and 1 g of biocatalyst, whereas amounts above 1 g accelerated conversion to below 50 minutes and maximised 6HLN accumulation.

The amount of biocatalyst from *P. nicotinovorans* NCAIM P(B) 001499 strain has been established for biotransformation of nicotine into 6HLN. Work regarding substrate concentrations and potential enzyme inhibitors is in progress.

# COMPARATIVE STUDY OF GUT MICROBIOME PROFILES IN NEUROLOGICAL AND GASTROINTESTINAL AUTOIMMUNE DISEASES

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Celiac Disease (CD) and Multiple Sclerosis (MS) are two distinct conditions that exemplify the complexities of autoimmune and neurodegenerative diseases. Recent research has increasingly focused on the role of the gut microbiome in health and disease. Dysbiosis, or an imbalance in the gut microbiota, has been implicated in the pathogenesis of various diseases, and emerging evidence suggests that the gut microbiome may influence disease progression, symptom severity, and overall patient outcomes in both CD and MS. This study investigates the microbiota associated with neurodegenerative disorders in relation to gastrointestinal (GI) conditions, employing publicly accessible metagenomic datasets. Our objective was to identify and characterize microbial signatures associated with different autoimmune disorders and to investigate the potential implications of these differences in disease pathology.

We performed a comprehensive analysis of α-diversity and β-diversity, using R v.4.4.1 and Python v.3.10 with the pandas, numpy, matplotlib.pyplot and seaborn libraries, to compare microbiota profiles in patients with CD and MS. Preliminary analyses indicate variances in microbiota composition across these conditions. Comparable to CD, patients with MS exhibited a decline in α-diversity, indicating an association between this disease and reduced microbial diversity. β-diversity analysis shows that the microbiota of the two diseases is differentiated by various species, indicating that the microbial profiles are not identical. Certain taxa, such as *Anaerotruncus* and *Dialister*, were found to be more prevalent in CD, while *Bacteroides* and *Akkermansia* displayed higher abundance in MS.

Our findings describe the main differentiators of the two disease's microbiome, giving valuable insights into the microbiome signatures associated with neurodegenerative and gastrointestinal disorders. Future research should include larger cohorts and focus on minimizing batch effects to avoid compromising genuine clinical variance.

## ZEBRAFISH: AN EXPERIMENTAL MODEL FOR INDUCTION AND STUDY OF ADHD SYMPTOMS

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In recent decades, attention deficit hyperactivity disorder (ADHD) has become an increasingly studied pathology, yet its neurobiological mechanisms remain partially unclear. Modeling ADHD in zebrafish (*Danio rerio*) represents a promising approach in the research of neurobiological mechanisms and the development of therapeutic strategies for this condition. Due to neurochemical and behavioral similarities with mammals, as well as advantages related to genetic manipulation and observation during rapid developmental stages, zebrafish have proven to be a robust experimental model for ADHD. The induction of specific ADHD symptoms, such as hyperactivity, impulsivity, and attention deficits, is achieved through the use of a wide range of neurotoxic and pharmacological substances, including 6-hydroxydopamine (6-OHDA), cocaine, neurotoxic pesticides, bisphenol A (BPA), and caffeine. These substances affect dopaminergic and noradrenergic neurotransmission, contributing to ADHD-like behaviors in zebrafish that resemble those observed in humans. In addition to chemical approaches, genetic manipulations targeting genes involved in neurotransmitter regulation, such as the dopamine transporter (DAT), provide an additional method for investigating the mechanisms of this disorder. The model is further validated by positive responses to pharmacological treatments used in human ADHD, such as methylphenidate and amphetamines. Thus, zebrafish offer an essential platform for exploring the etiology of ADHD and testing new therapies, contributing to a better understanding of the disorder and the development of innovative therapeutic strategies. This research aims to provide a comprehensive synthesis of current studies on the use of zebrafish as an experimental model for ADHD by describing the methods used for inducing ADHD symptoms, including neurotoxic substances and applied genetic modifications, and assessing the validity of this model by comparing zebrafish behavior to that observed in human ADHD.

# IRON – OXIDE NANOPARTICLES FOR DENTAL APPLICATIONS. A REVIEW

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This review summarizes the most recent articles issued in the literature of the field on the applications of iron-oxide nanoparticles in dentistry. It provides a general overview of the properties and synthesis of nanoparticles and summarizes the clinical applications and current research directions of iron-oxide nanoparticles, stressing their potential in dental care and in improving patient outcomes. The integration of nanoparticles in dentistry has emerged as a potential breakthrough in addressing various dental conditions. Magnetic nanoparticles with magnetic cores encapsulated in a biocompatible coating enable precise manipulation by external magnetic fields, and play an important role in targeted drug delivery, diagnostic tests and magnetic resonance imaging. Their use in orthodontic treatments and dental implants facilitates tooth movement and tissue engineering, thus improving clinical outcomes and patient comfort. The dental applications of iron-oxide nanoparticles is an area that requires continued study due to the various types of nanoparticles in use, each with different potential to treat multiple dental conditions.

## *RESURSE EDUCAȚIONALE ÎN BIOLOGIE*

## *SECȚIA: GENERAL 3*

## COMUNICĂRI ORALE

### ANALIZA UNOR MANUALE DE BIOLOGIE DE LA GIMNAZIU DIN PERSPECTIVA ÎNVĂȚĂRII BAZATE PE INVESTIGAȚIE

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Învățarea bazată pe investigație (Inquiry-Based Learning, IBL) reprezintă o abordare pedagogică ce plasează elevul în centrul procesului educațional, încurajându-l să exploreze activ și să dezvolte competențe esențiale precum gândirea critică și rezolvarea de probleme. În contextul educațional actual, învățarea bazată pe investigație oferă o alternativă prin care elevii nu doar că acumulează cunoștințe, ci le descoperă și le aplică în mod independent.
Lucrarea de față prezintă rezultatele analizei de conținut asupra unor manuale școlare, din perspectiva modului în care principiile și modalitățile de implementare a învățării bazate pe investigație se reflectă în conținutul și abordările metodologice cuprinse în câteva manuale de biologie, utilizate la gimnaziu.
Lucrarea este fundamentată teoretic pe o serie de concepte precum: natura cunoașterii științifice (NOSK), natura investigației științifice (NOSI), modelul educațional 5E, tipurile de învățare bazată pe investigație. Este explorat raportul dintre gradul de autonomie a elevilor și nivelul de control exercitat de profesor în cadrul diferitelor tipuri de învățare bazată pe investigație. Sunt analizate avantajele predării bazate pe investigație la clasă, abilitățile dezvoltate elevilor și provocările pentru profesori, respectiv soluțiile asociate acestui mod de predare.
Metoda de cercetare utilizată a fost analiza de conținut a documentelor școlare. Astfel, au fost luate în studiu 7 manuale alternative de biologie, după un număr de 9 criterii, concepute în acord cu etapele de parcurs în procesul învățării bazate pe investigație. Pentru fiecare criteriu a fost acordat un punctaj, după intervalele: 0 - 4 puncte: necesită îmbunătățiri semnificative; 5 - 7 puncte: satisfăcător; 8 - 10 puncte: excepțional. Punctajele între care s-au încadrat manualele analizate sunt de minim 66 puncte și maxim de 79 puncte.
Rezultatele analizei scot în evidență accentul pus în manuale pe efectuarea de observații, pe utilizarea unor surse de informare/documentare, pe colectarea și analiza datelor, pe comunicarea rezultatelor investigațiilor. Lucrarea se încheie cu o serie de recomandări privind îmbunătățirea conținutului acestor resurse educaționale din perspectiva implementării învățării bazate pe investigație prin: îndrumări și exemple pentru formularea de întrebări investigative provocatoare, pentru formularea de ipoteze corecte, pentru planificarea realistă a unor investigații, pentru includerea unor activități de reflecție autentice.

# CUNOȘTINȚE ȘI ATITUDINI ALE UNOR ELEVI DE LICEU DIN ROMÂNIA ÎN PRIVINȚA BIOTEHNOLOGIILOR

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Lucrarea de față pornește de la premiza că școala joacă un rol major în formarea unor cetățeni capabili să facă față schimbărilor, atât economice, cât și sociale, care sunt aduse de evoluțiile din domeniul biotehnologiilor. Elevii trebuie să se pregătească pentru a lua decizii democratice în probleme legate de medicină, mediu înconjurător și genetică, ceea ce implică aplicarea cunoștințelor, înțelegerii și atitudinilor dobândite în urma studiului științei în viața de zi cu zi.
Atitudinile și cunoștințele privind biotehnologiile la elevii de vârstă școlară au fost mai puțin cercetate în comparație cu cele ale adulților. Din acest motiv, prin lucrarea de față ne propunem să redăm rezultatele unei cercetări empirice cu privire la cunoștințele și atitudinilor elevilor de liceu în materie de biotehnologii. Obiective vizate în lucrare sunt: (1). Explorarea cunoștințelor elevilor români de liceu asupra biotehnologiilor; (2). Explorarea diferențelor privind percepțiile legate de biotehnologii în funcție de variabilele de gen, vârstă, profil (teoretic și tehnologic); (3). Identificarea corelației dintre cunoștințe și atitudini cu privire la biotehnologii; (4) Analiza documentelor curriculare românești cu referire la biotehnologii.
Participanții la studiu au fost 111 elevi, din clasele IX-XII, de la Liceul Tehnologic ”Eremia Grigorescu” Târgu - Bujor, Galați și de la Liceul Tehnologic Agricol ”Olga Sturdza” Miroslava, Iași. Pentru a măsura nivelul cunoștințelor participanților, a fost utilizat chestionarul BKQ (*Biotechnology Knowledge Questionnaire*), iar pentru a aprecia atitudinilor elevilor, a fost utilizat chestionarul BAQ (*Biotechnology Attitudes Questionnaire*). Ambele chestionare au fost adaptate particularităților grupului țintă cu care s-a lucrat în acest studiu. Pentru analiza răspunsurilor la chestionare, au fost utilizate statistici descriptive (medii, frecvențe și procentaje).
Pe baza centralizării rezultatelor, se pot trage următoarele concluzii: (1). Există diferențe privind cunoștințele și atitudinile legate de biotehnologii, în funcție de gen, vârstă, profil, dar și de specializare în rândul elevilor din două licee din județul Iași, respectiv Galați; (2). Există o corelație pozitivă între cunoștințe și atitudini cu privire la biotehnologii; (3). Documentele curriculare analizate, respectiv manualele de biologie de clasa a XII-a tratează succint conținuturile programei școlare referitoare la considerațiile bioetice în genetica umană și domeniile de aplicabilitate.

# INVESTIGAREA CREATIVĂ A GERMINAȚIEI SEMINȚELOR LA SPECII DE *ADANSONIA* IN CONDIȚII EXPERIMENTALE

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În lucrarea de față sunt prezentate rezultatele unui proces investigativ creativ, expresie a curiozității, pasiunii și dorinței studentului de a reuși să stimuleze geminația semințelor, în condiții experimentale, de la unul din cei mai uimitori și impunători arbori existenți la ora actuală pe suprafața Pământului și anume - baobabul. Activitățile de investigare au inclus două specii de baobab (*Adansonia digitata* și *Adansonia grandidieri),* dintre cele nouă existente pe Terra.
Circumscrisă metodei științifice, investigația pornește de la capacitatea studentului de a face observații, de a-și pune întrebări, de a sesiza probleme și respectiv, de a formula ipoteze de lucru. Activitatea investigativă propriu – zisă continuă cu testarea ipotezelor, planificarea și realizarea experimentelor/analizelor, efectuarea de măsurători, colectarea și interpretarea datelor, formularea de concluzii. Ciclul de lucru se finalizează cu prezentarea/comunicarea rezultatelor și cu discuții, reflecții post-cercetare. Acest ciclu procesual este parcurs de cel care învață în diferite variate de ghidaj din partea cadrului didactic. Dacă în stadiile inițiale de parcurgere a procesului, studentul se află în mai mare măsură sub ghidajul cadrului didactiv, în stadii mai avansate, studentul capătă din ce în ce mai multă independență și autonomie în acest proces, manifestându-și potențialul creativ, catalizat de curiozitate și interes pentru cunoaștere.
În acest sens, studiul de caz supus atenției a vizat următoarele obiective de cercetare: analiza morfologică comparativă a semințelor de la *Adansonia grandidieri* și *Adansonia digitata;* analiza germinației semințelor de *Adansonia grandidieri* și *Adansonia digitata* în condiții de laborator; analiza morfologică și structurală a speciilor de *Adansonia grandidieri* și *Adansonia* pe parcursul etapelor timpurii de creștere și dezvoltare, în condiții de laborator. Aceste obiective au fost realizate cu succes prin metode adecvate: de la analize morfologice și morfometrice clasice, la analize micromorfologice la microscopul electronic cu baleiaj; de la aplicații nereușite a protocolului de lucru pentru stimularea germinației semințelor la unele reușite, urmate de analize morfologice și structurale la plantulele de baobab, crescute în condiții de laborator.
Rezultatele obținute reprezintă rodul motivației bine definite a studentului pentru acest subiect, rodul muncii și perseverenței sale, în condițiile în care procesul investigativ a fost deschis și creativ.

# ANALIZA NEVOILOR DE FORMARE A PROFESORILOR DE BIOLOGIE PENTRU REALIZAREA EDUCAȚIEI SEXUALE LA GIMNAZIU

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Lucrarea de față pornește de la premiza nevoii de realizare a educației sexuale în școli, atât din perspectivă educațională, cât și psiho-socială. Implementarea educației sexuale de către cadre didactice pregătite poate contribui semnificativ la dezvoltarea unei societăți mai informate, mai sănătoase și mai echitabile. În acest context, scopul lucrării este de a analiza nevoile de formare a profesorilor de biologie în realizarea educației sexuale la gimnaziu.

Cercetarea, a fost realizată pe un grup țintă de 102 profesori de biologie, și a pornit de la următoarele ipoteze: (1). Profesorii de biologie din învățământul gimnazial nu au pregătirea necesară pentru a aborda eficient și cuprinzător temele legate de educația sexuală; (2). Curriculumul actual de educație sexuală din învățământul gimnazial nu este suficient de cuprinzător și nu reflectă nevoile reale ale elevilor; (3). Introducerea unui program de formare continuă și specializată în educația sexuală pentru profesorii de biologie va crește semnificativ competențele acestora în predarea acestui subiect și va îmbunătăți percepția elevilor asupra educației sexuale.

Pentru colectarea de date, privind nevoile de formare a profesorilor de biologie, a fost folosită metoda cantitativă, cu ajutorul unui chestionar, care a inclus 28 de întrebări grupate pe 5 secțiuni, după cum urmează: (1) date de identificare; (2) nivelul de cunoștințe privind educația sexuală; (3) atitudini și percepții privind educația sexuală; (4) teme și metode utilizate în educația sexuală; (5) nevoi de formare continuă percepute. Răspunsurile la un număr de 16 întrebări au fost evaluate cu ajutorul Scalei Likert, care conține 5 opțiuni de răspuns (dezacord total, dezacord, neutru, de accord, total de acord), inclusiv două laturi extreme și un punct neutru median.

Datele și informațiile colectate au aratat că profesorii doresc să își auto - evalueze și să-și dezvolte cunoștințele și competențele în domeniul realizării educației sexuale, să își exploreze să-și dezvolte atitudinile și percepțiile privind educația sexuală și importanța acesteia. De asemenea, lucrarea include considerații privind ariile de conținut și zonele de competență în care cadrele didactice consideră că au nevoie de suport formativ suplimentar. Pe aceste baze, în lucrare sunt incluse recomandări care vizează îmbunătățirea continuă a calității educației sexuale prin formarea adecvată a profesorilor, actualizarea conținuturilor școlare și adoptarea unor abordări integrate și colaborative.

## *RESURSE EDUCAȚIONALE ÎN BIOLOGIE*

## *SECȚIA: GENERAL 3*

## POSTERE

### AN EPIGENETIC PERSPECTIVE ON THE RELATIONSHIP BETWEEN ARTISTIC EDUCATION, WELL - BEING AND ACADEMIC PERFORMANCE

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The study conducts a comparative analysis of the relationship between artistic education, well-being, and academic performance among two groups of high school students: 128 students from the “Octav Băncilă” Art College, Iași and 126 students from the “Dimitrie Cantemir” Theoretical High School, Iași. It emphasizes the significance of artistic education in creating a supportive learning environment that nurtures artistic skills and facilitates epigenetic transformations, which enhance emotional expression and psychological health. This perspective helps to understand how environmental factors and genetic predispositions interact to affect student outcomes in artistic education, thereby deepening the analysis of the connections between artistic education, well-being, and academic performance. The study utilizes a psychological test based on the Academic Motivation Scale in the field of Educational Psychology, and the Openness to Experiences Scale, in the Personality field [IPIP]. A key factor in interpreting the responses of participants is their belonging to the 2020-2024 generation, having begun high school during the pandemic. This context likely limited their engagement with the specialized curriculum, potentially affecting their well-being and academic performance more profoundly than their participation in artistic activities. To investigate differences in well-being and academic performance between the two groups, the study employed a T-test for independent samples. The internal consistency of the assessment items was evaluated using Cronbach's Alpha coefficient, with data analysis via SPSS 26. The findings reveal that the anticipated beneficial influence of art on stress through epigenetic mechanisms was not confirmed. While art offers opportunities for emotional expression and stress reduction, its positive effects may be overshadowed by personal and external factors, such as performance pressure, family dynamics, and unexpected events like the pandemic, suggesting that stress and well-being might depend more on these elements than on artistic engagement.