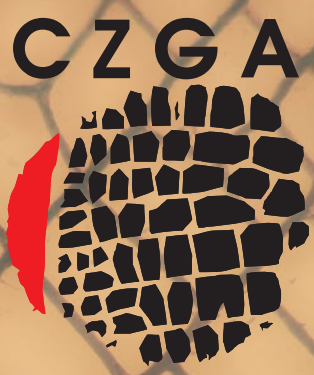
# International Zoological Congress of "Grigore Antipa" Museum




**18 - 21 November 2015**
**Bucharest - Romania**

# Book of Abstracts

**Edited by:**
**Luis Ovidiu Popa, Costică Adam, Gabriel Chişamera, Elena Iorgu, Dumitru Murariu, Oana Paula Popa**

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**Ana-Maria Krapal**
**Larisa-Bianca Dumitrescu**



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e-mail: contact@digitalprints.ro; digitalprint.ro@gmail.com

# Summary



## Invited speakers



## Oral presentations

### Taxonomy. Faunistics. Zoogeography

## Phylogenetics, Evolution and Systematics

## Palaeontology



## Ecology

## Biodiversity conservation

## Studies and recovery of the natural history museum patrimony



# Poster presentations

## Taxonomy. Faunistics. Zoogeography

## Palaeontology



## Ecology

## Invasive species

## Parasitism in the animal kingdom



## Biodiversity conservation

# CZGA 2015 PROGRAMME

## WEDNESDAY, 18th OF NOVEMBER 2015

08:30-12:00
**Registration**

09:00-09:10
**Luis Ovidiu POPA** - Welcome and Greetings

## Invited speakers

09:10-09:50
**Angelika BRANDT** - From early biological deep-sea expeditions to present investigations - results and perspectives

09:50-10:30
**Timothy J. EHLINGER** - Riding the infinity wave: operationalizing resilience principles in natural resource stewardship

***10:30-11:00***
***Coffee break***

## Taxonomy. Faunistics. Zoogeography

### Chair: Eduardo ROLDAN (Madrid, Spain)

11:00-11:15
**Vitaliy ANISTRATENKO** - Towards a phylogeography of the Ponto-Caspian mollusks inhabiting the Azov-Black Sea Basin

11:15-11:30
**Cosmin Ovidiu MANCI, Irinel Eugen POPESCU** - More than fifty years after the last recording of *Leucorrhinia pectoralis* (Charpentier, 1825) (Odonata: Libellulidae) in Romania

11:30-11:45
**Alexandru IFTIME, Oana IFTIME** - New herpetological records from Cozia National Park

11:45-12:00
**George-Ioan MĂRGINEAN, Elena GHERMAN** - An assessment of *Emys orbicularis* online trade in Romania - a threat factor for conservation

12:00-12:15
**Marian TUDOR, Alexandra TELEA, Dragoş BĂLĂŞOIU** - The Blotched Snake (*Elaphe sauromates*) in Dobrudja: How rare this species really is?

12:15-12:30
**Anastasia LUNGU-BUCŞAN, Anatol SAVIN, Victoria NISTREANU** - Importance of Common Pheasant (*Phasianus colchicus*) for the game fauna of Moldova

12:30-12:45
**Szilárd BÜCS, István CSŐSZ, Csaba JÉRE, Csaba BARTHA, Farkas SZODORAY-PARÁDI, Alexandra TELEA, Dragoș BĂLĂȘOIU, Teodora SINCULEȚ** - New data regarding the status and distribution of Horseshoe bats (genus *Rhinolophus*) in karst areas of Southern Romania

12:45-13:00
**Edoardo VERNIER, Bronisław W. WOŁOSZYN** - Researches on bat presence in some valleys and natural protected areas of Dolomites Mountains, Unesco World Heritage, region Veneto (N.E. Italy)

13:00-13:15
**Bronisław W. WOŁOSZYN, Roksana SOCHA** - A preliminary study on distribution and biodiversity of small mammals from the foothills of the Sierra de Guara Range (Huesca Province, Spain)

***13:15-14:15***
***Lunch Break***

## Invited speakers

14:15-14:55
**Zeev ARAD** - Resistance to desiccation and heat in Land Snails: from whole animal to molecular mechanisms

14:55-15:35
**Eduardo ROLDAN** - Evolution of reproductive genes and male traits in mammals

## Phylogenetics, Evolution and Systematics

### Chair: Elisabeth HARING (Vienna, Austria)

15:35-15:50
**Adam KONEČNÝ** - How to learn about population history - an inference from genetic data

15:50-16:05
**Ioana Cristina CONSTANTINESCU, Gabriel CHIŞAMERA, D. Khlur B. MUKHIM, Chrysanthemum MASSAR, Costică ADAM** - Descriptions of new species with a key to identification of the genus *Timalinyssus* Mironov, 2001 (Acarina, Psoroptidia)

16:05-16:20
**Lucian FUSU, Mădălina I. VICIRIUC, Maria-Magdalena DASCĂLU, Ovidiu A. POPOVICI, Mircea D. MITROIU** - Phylogenetic analysis and species discrimination within *Spalangia* Latreille (Hymenoptera, Chalcidoidea, Pteromalidae), using molecular data and morphological characters

16:20-16:35
**Elena Iulia IORGU, Ionuț Ștefan IORGU, Mihaela Isabela VADANA, Larisa Bianca DUMITRESCU, Alexandra Florina LEVĂRDĂ-POPA, Ana-Maria KRAPAL, Oana Paula POPA, Anton KRIŠTÍN, Luis Ovidiu POPA** - Assesing haplotype diversity in the mountainous species *Pholidoptera transsylvanica*

***16:35-18:00***
***Coffee, Tea and Posters***

THURSDAY, 19th OF NOVEMBER 2015

08:30-09:00
**Registration**

## Invited speakers

09:00-09:40
**Elisabeth HARING** - ABOL - The Austrian Barcode of Life-Initiative

09:40-10:20
**Johan MICHAUX** - Why some species disappear and other expand? The example of the minks and the European otter

10:20-10:30
**Travaux du Muséum National d'Histoire Naturelle "Grigore Antipa"**

***10:30-11:00***
***Coffee break***

## Ecology

### Chair: Marius SKOLKA (Constanța, Romania)

11:00-11:15
**Dana HŘÍVOVÁ, Marie ZHAI** - Harpacticoida (Copepoda, Crustacea) of the Western Carpathian spring fens: influence of climate, nutrients and pH on species ecology

11:15-11:30
**Joanna KOCOT-ZALEWSKA, Grzegorz KŁYS, Bronisław W. WOŁOSZYN** - Quantity methods in invertebrates' biodiversity assessment in Polish caves

11:30-11:45
**Darmina DATCU, Mihaela SAVA, Geta RÎŞNOVEANU** - The impact of microhabitat composition on benthic invertebrate communities structure in streams of Prahova river basin

11:45-12:00
**Mircea VARVARA** - Distribution, abundance and dominance of three species of the genus *Brachinus* (Coleoptera: Carabidae) in seven agricultural crops in Romania, 1977-2012

12:00-12:15
**Martin ČERNÝ, Miroslav ŠÁLEK** - Home range structure and its impact on survival of Grey Partridge

12:15-12:30
**Dragoş Ştefan MĂNTOIU, Ionuţ C. ŞANDRIC, Oana T. MOLDOVAN** - Habitat suitability modelling for twelve EU priority bat species within South Eastern Europe

12:30-12:45
**Marius-Alexandru CIOCĂNĂU, Oana Mirela CHACHULA, Dragoș Ștefan MĂNTOIU, Georgeta ȘTEFAN, Mihai Luchian ALEXE, Doina DANEȘ** - Potential consequences of pesticide use upon local bat population (Mammalia: Chiroptera)

12:45-13:00
**Bronisław W. WOŁOSZYN** - Light pollution and nocturnal mammals. Case study: influence of artificial light on bats

13:00-13:15
**Victoria NISTREANU, Alina LARION, Vlad POSTOLACHI, Victoria BURLACU, Natalia CARAMAN** - Ecological peculiarities of small mammal communities from "Plaiul Fagului" Reserve, Republic of Moldova

***13:15-14:15***
***Lunch Break***

## Invited speakers

14:15-14:55
**Víctor SÁNCHEZ-CORDERO** - Biodiversity and Climate change: two study cases

14:55-15:35
**Boris KRYŠTUFEK** - Who cares about natural history collections?

## Studies and recovery of the natural history museum patrimony

### Chair: Dumitru MURARIU (Bucharest, Romania)

15:35-15:50
**Ioan TĂUȘAN, Ioana Cristina NEGRILĂ** - The Ant Collection (Hymenoptera: Formicidae) of the Natural History Museum of Sibiu (Romania)

15:50-16:05
**Konstantin PROTODYAKONOV, Semyon GRIGORIEV, Maksim CHEPRASOV, Sergey FEDOROV, Gavril NOVGORODOV** - The value of paleontological collections of the "P. A. Lazarev" Museum of Mammoth for the knowledge of the biosphere evolution in the Quaternary

## Palaeontology

### Chair: Dumitru MURARIU (Bucharest, Romania)

16:05-16:20
**Radu-Mihai ILIE, Dragoş PANAITESCU, Ştefan VASILE, Mirela DRAGOŞ** - The presence of *Elephas antiquus* (Proboscidea: Elephantidae) in the Pleistocene of the Dacian Basin (Southern Romania) - preliminary results

16:20-16:35
**Ştefan VASILE, Valentin DUMITRAŞCU** - "What's your beef?" - taxonomical assessement of the large bovid hunted in the upper Palaeolithic from Buda (Bacău County, Romania)

***16:35-17:05***
***Presentation from BBC Earth***

***17:05-18:00***
***Coffee, Tea and Posters***

FRIDAY, 20th OF NOVEMBER 2015

08:30-09:00
**Registration**

## Invited speakers

09:00-09:40
**Thomas WILKE** - Ancient Lake Ohrid: Linking geological and biological evolution

09:40-10:20
**Helmut SATTMANN** - The American Giant Liver Fluke: heading further south toward the Black Sea

***10:20-10:50***
***Coffee break***

## Taxonomy. Faunistics. Zoogeography

### Chair: Abraham bij de VAATE (Lelystad, The Netherlands)

10:50-11:05
**Lucian PÂRVULESCU, Mălina PÎRVU, Loredana-Giorgiana MOROŞAN, Claudia ZAHARIA** - Plasticity in fecundity highlights the females' importance in the spiny-cheek crayfish invasion mechanism

11:05-11:20
**Irinel Eugen POPESCU, Ionuţ Ştefan IORGU** - Second confirmed station for *Carabus hungaricus* (Fabricius 1792) (Coleoptera: Carabidae) in Romania

11:20-11:35
**Levente SZÉKELY** - New and rare Macrolepidoptera from Romanian Dobrogea (SE-Romania)

11:35-11:50
**Ioan TĂUȘAN, Alexandru PINTILIOAIE** - First record of the dacetine ant *Strumigenys argiola* (Hymenoptera: Formicidae) from Romania

## Biodiversity Conservation

### Chair: Boris KRYŠTUFEK (Ljubljana, Slovenia)

11:50-12:05
**Bekka S. BRODIE, Viorel D. POPESCU, Laurențiu ROZYLOWICZ, Melissa FIERKE** - Diversity, abundance, and occupancy of longicorn beetles (Coleoptera: Cerambycidae) in traditionally-managed Romanian forests

12:05-12:20
**Simona MIHĂILESCU, Ion CRISTEA, Viorica HONCIUC, Daniela STRAT** - Monitoring of species and habitats of community interest from Romania for assessing the conservation status

12:20-12:35
**Alexandru BURCEA, Gina-Oana POPA, Iulia Elena FLORESCU, Lucica TOFAN, Andreea DUDU, Sergiu Emil GEORGESCU, Marieta COSTACHE** - Genetic characterisation of *Huso huso* Linnaeus, 1758 aquaculture individuals using microsatellite markers

12:35-12:50
**Alexandru IFTIME, Oana IFTIME** - Natural and artificial fragmentation in *Bombina variegata* (Amphibia: Anura: Bombinatoridae) populations in and around Cozia National Park

***12:50-13:50***
***Lunch Break***

## Invited speaker

13:50-14:30
**Rafael ARAUJO** - Knowing and conserving the West Palearctic naiads

## Biodiversity Conservation

### Chair: Boris KRYŠTUFEK (Ljubljana, Slovenia)

14:30-14:45
**Alexandra TELEA, Dragoș BĂLĂȘOIU, Marian TUDOR** - A new method of identifying recaptured individuals of small lizards: a case study on the skink *Ablepharus kitaibelii* ssp. *stepaneki*

14:45-15:00
**Mihaela CIOBOTĂ, Andreea CIOBOTĂ, Cristina Andrea STAICU** - Contributions to the study on Black Stork populations ecology within Dumbrăviţa Fishing Complex

15:00-15:15
**Viorel D. POPESCU, Ioan-Mihai POP, Steluța MANOLACHE, Kyle ARTELLE, Laurențiu ROZYLOWICZ** - Assessing biological realism of wildlife population estimates in data-poor systems

15:15-15:30
**George BOUROȘ** - Distribution, habitat use and threats of Eurasian otter (*Lutra lutra*) in Putna Vrancea Natural Park (South-eastern Carpathians, Romania)

15:30-15:45
**Marco LUCCHESI, Edoardo VELLI, Roberto SANTONI, Giovanni QUILGHINI** - Non-invasive monitoring of the European wildcat (*Felis silvestris silvestris*) in the Biogenetic Casentinesi Reserves: a six year-long study experience

15:45-16:00
**Edoardo VELLI, Marco A. BOLOGNA, Federica MATTUCCI, Ettore RANDI** - Mitochondrial DNA-based phylogeography of the European wildcat (*Felis silvestris silvestris*) in Europe: extant structure and historical inferences on species' biogeography

16:00-16:15
**Lucian Marius PĂTRAȘCU, Silviu CHIRIAC, Ioan-Mihai POP, Radu Mihai SANDU, Jozsef BOTH** - An assessment of Brown bear and human interactions in Romania: 2002-2015

16:15-16:30
**Andrea GAZZOLA, Teodora SIN, Ioan-Mihai POP, György Lajos BERDE, Szilárd SZABÓ, Andrea CORRADINI, Silviu CHIRIAC** - WOLFLIFE project. Survey design and preliminary results for the estimation of wolf population size and packs' distribution in the Eastern Carpathians, Romania

16:30-16:45
**Răzvan POPESCU-MIRCENI, Răzvan ZAHARIA, Marius PALADE, Nicoleta MARIN** - An analysis of dolphin stranding on Romanian Black Sea coast

***16:45-18:00***
***Coffee, Tea and Posters***

***18:30-19:30***
***Visit of the permanent exhibition of "Grigore Antipa" National Museum of Natural History***

***19:30-22:00***
***Gala Dinner***

SATURDAY, 21st OF NOVEMBER 2015

*Whole day excursion to Bran castle, Brașov County*

# Poster Presentations

## Taxonomy. Faunistics. Zoogeography

**P 001.**
**Alberto M. GÁNDARA, Mihaela Isabela VADANA, Larisa-Bianca DUMITRESCU, Oana Paula POPA, Luis Ovidiu POPA** - Preliminary morphometric study of *Hypanis plicata relicta* shells of the Razelm lake

**P 002.**
**Fatemeh SABERFAR, Mohammad KHANJANI, Masoumeh KHANJANI** - Identification of tenuipalpid mites associated with oak trees in Nahavand County, Iran

**P 003.**
**Samira BAKHSHI, Mohammad KHANJANI, Masoumeh KHANJANI** - Fauna of family Tenuipalpidae (Acari: Prostigmata) in Qom vicinities, Iran

**P 004.**
**Samira BAKHSHI, Mohammad KHANJANI** - Fauna of family Raphignathidae (Acari: Trombidiformes) in Shiraz town, Iran

**P 005.**
**Nazila HONARPARVAR, Mohammad KHANJANI, Mohammad AHMAD HOSEINI** - Re-description of female and immature stages of *Bryobia rubrioculus* Scheuten (Acari: Tetranychidae) from western Iran

**P 006.**
**Soheila JAFARI, Mohammad KHANJANI, Masoumeh KHANJANI** - Fauna of the genus *Aceria* (Acari: Eriophydae) in Hamedan Province, Iran

**P 007.**
**Mehdi KARIMI, Mohammad KHANJANI, Masoumeh KHANJANI** - Predatory mites of superfamily Raphignathoidea associated with spider mites in different orchards of Tuyserkan, Hamedan Province, Iran.

**P 008.**
**Mehdi KARIMI, Mohammad KHANJANI, Bahman ASALI FAYAZ** - Phytoseiid mites associated with two spotted spider mites of some stone fruit trees in Kohnush region, Hamedan Province, Iran

**P 009.**
**Masoumeh KHANJANI, Mohammad KHANJANI, Owen D. SEEMAN, Fatemeh AMINI** - Faunistic study of the genera *Brevipalpus* and *Cenopalpus* (Acari: Tenuipalpidae) in North and West of Iran

**P 010.**
**Fatemeh AMINI, Mohammad KHANJANI, Masoumeh KHANJANI** - Fauna of Raphignathoidea (Acari: Prostigmata) in Kurdistan Province, Iran

**P 011.**
**Azadeh NADIM, Masoumeh KHANJANI, Mohammad KHANJANI, Fatemeh SABERFAR** - Fauna of superfamilies Raphignathoidea and

Tetranychoidea (Acari: Prostigmata) in Ramsar town, Mazandaran Province, Iran

**P 012.**
**Alireza NADRI, Masoumeh KHANJANI, Mohammad KHANJANI Mohammad Reza AMIN** - Fauna of the family Stigmaeidae (Acari: Prostigmata) in Alashtar town, Lorestan Province, Iran

**P 013.**
**Shahram PISHEHVAR, Mohammad KHANJANI, Fatemeh SABERFAR, Masoumeh KHANJANI** - Fauna of the families Stigmaeidae and Cryptognathidae (Acari: Prostigmata) associated with oak trees in Nahavand County, Iran

**P 014.**
**Ioana NAE** - Mesovoid Shallow Substratum (MSS) - ecological microrefuge for detritivore soil-dwelling species - Case study on Oribatid mites (Acari: Oribatida) from Piatra Craiului Mountains, Romania

**P 015.**
**Anda Felicia BĂBĂLEAN** - Contribution to the study of the harvestmen fauna (Arachnida: Opiliones) from Latorita Valley (Romania)

**P 016.**
**Liviu Aurel MOSCALIUC, Mariia FEDORIAK** - Faunistic overview of the Pholcid spiders (Araneae: Pholcidae) from Romania

**P 017.**
**Andrei GIURGINCA, Ştefan Cătălin BABA, Leonard DOROBĂŢ, Ionuţ POPA** - The Diplopoda and Chilopoda of the Leaota Mountains (Southern Carpathians, Romania)

**P 018.**
**Liudmyla GAPONOVA, Maria HOLYNSKA** - Towards a revision of the *Eucyclops* (Crustacea: Copepoda) in Ukraine

**P 019.**
**Ionuţ POPA, Augustin NAE, Andrei GIURGINCA, Leonard DOROBĂŢ** - New records of Collembola and Araneae species for the Romanian fauna (Leaota Massif, Southern Carpathians)

**P 020.**
**Ali MİROĞLU, Ali SALUR** - Variations in *Platycnemis dealbata* (Insecta: Odonata) from Turkey

**P 021.**
**Ali SALUR, Mustafa Cemal DARILMAZ, Ali MİROĞLU, Bayram ALTINIŞIK** - Faunistic and ecological studies on aquatic and semiaquatic Heteroptera species (Insecta) of Yedigöller National Park

**P 022.**
**Daniel Kazimir KURZELUK** - Comparative distributional and species' group analysis of the Western Palaearctic taxa of *Trichodes* Herbst 1792 (Coleoptera: Cleroidea: Cleridae)

**P 023.**
**Florin PRUNAR, Stephane DREANO, Jean BARLOY, Frederique BARLOY-HUBLER** - Kinship between *Carabus* (*Morphocarabus*) *rothi* Dejean, 1829 and *Carabus* (*Morphocarabus*) *alutensis* Săvulescu, 1972

**P 024.**
**Cristina Maria CALEFARIU, Alexandra Florina LEVĂRDĂ-POPA** - Data on *Eucera* Scopoli, 1770 species (Apidae: Apinae: Eucerini) from Romania

**P 025.**
**Francis Dupont FEUGANG YOUMESSI, Elaine De CONINCK, Françoise HUBRECHT, Yves BRAET, Luc BOURGUIGNON, Champlain DJIETO-LORDON, Charles Félix BILONG BILONG** - Taxonomic study of some Calliphoridae flies that emerged during the rearing of larvae collected on laboratory bred rat carcasses (*Rattus norvegicus* Berkenhout, 1769) (Muridae) in the Zoology Laboratory of the University of Yaounde I, Cameroon

**P 026.**
**Fatma HALOUANE, Nora CHAHBAR, Naima OUKIL, O. KHALFI** - Research on Agromyzides of Algiers: inventory and bio-ecology

**P 027.**
**Philippe MUNYANDAMUTSA** - Species-specific tooth shape in Haplochromine cichlids

**P 028.**
**Ovidiu POPESCUL, Mitică CIORPAC, Radu DRUICĂ, Lucian D. GORGAN** - Molecular phylogeny of *Scardinius erythrophthalmus* (Pisces: Cypriniformes) inferred by cytochrome C oxidase subunit I (COI) gene analysis

**P 029.**
**Sudesh BATUWITA, Udeni EDIRISINGHE** - *Nessia gansi*: a second three-toed snake-skink (Scincidae) from Sri Lanka

**P 030.**
**Carmen Daniela BĂLESCU, Carmen GACHE** - Aquatic bird fauna in the protected area Preajba - Făcăi Lacustrine Complex (Dolj County)

**P 031.**
**Larisa BOGDEA, Nicolai ZUBCOV, Vasili CRUDU, Andrei MUNTEANU, Natalia SOCHIRCĂ** - Changes of the nests' settlement of the White stork (*Ciconia ciconia* L.) in Republic of Moldova

**P 032.**
**Matei-Ionuț DRAGOMIR, Gabriel CHIȘAMERA, Costică ADAM, Alina DRAGOMIR** - A new breeding site for the Oystercatcher (*Haematopus ostralegus*) in the Special Protection Area ROSPA0071 Lower Siret Meadow (Eastern România)

**P 033.**
**Cătălin-Răzvan STANCIU, Răzvan ZAHARIA** - Migration strategies of common buzzard (*Buteo buteo* Linnaeus, 1758) in Dobrudja, Romania

**P 034.**
**Georgiana MĂRGINEAN** - Bats (Mammalia: Chiroptera) of Racovița and surroundings (Făgăraş Depression, Transylvania)

**P 035.**
**Oana Mirela CHACHULA, Lotus Elena MEŞTER, Cezar Georgian SPĂTARU, Georgiana MĂRGINEAN** - New data regarding bat species from caves in Bucegi National Park, Romania

**P 036.**
**Andreea-Diana BOSTAN, Oana Mirela CHACHULA, Dragoş Ştefan MĂNTOIU** - The behaviour of bats in urban areas of Bucharest, Romania

**P 037.**
**Oana Mirela CHACHULA, Georgiana MĂRGINEAN, Andreea-Diana BOSTAN, Mihaela SOPINCEAN, Ioan COROIU** - Analyses on cranial paramethers and mortality case of *Nyctalus noctula* colony (Chiroptera: Vespertilionidae) in a cave from Grădiştea Muncelului-Ciclovina Natural Park, Romania

**P 038.**
**Xenia POP, Alexandru GUDEA, Aurel DAMIAN** - Archaeozoological data from the 8th century archaeological diggings carried out in Iernut (Mureş county)

## Phylogenetics, Evolution and Systematics

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# INVITED SPEAKERS

# Resistance to desiccation and heat in Land Snails: from the whole animal to molecular mechanisms

Zeev ARAD

Department of Biology, Technion, Haifa 32000, Israel, e-mail: zarad@tx.technion.ac.il

**Key words:** land snails, eco-physiology, desiccation, distribution pattern, HSPs.

Land snails, like all other terrestrial animals, must cope with the problem of maintaining water balance. Therefore, their ability to colonise terrestrial habitats is the result of their developing a range of behavioural and physiological adaptations for coping with problems of maintaining water and thermal balance to ensure their survival under specific microhabitat conditions. This is much more difficult for land snails that inhabit arid and semi-arid areas, where conditions of high ambient temperature and low humidity prevail. One of these adaptations is their annual cycle of activity and aestivation that correlates with seasonal changes in temperature, humidity and water availability.

This presentation summarizes about 25 years of research on resistance to desiccation and heat in *ca*. 25% of the Israeli land snail fauna. In general, resistance to heat and aridity was related to the distribution patterns and to the abiotic environmental variation. The study comprised of intra-generic and intra-specific comparisons and microhabitat and phylogeny-related differences. We also tested the effects of body size, ontogeny and the physiological set-points of the water regulatory mechanisms. Recently, we studied the molecular mechanisms functioning under stress conditions and reflected in the patterns of expression of heat shock proteins (HSPs).

# Knowing and conserving the West Palearctic naiads

Rafael ARAUJO

Museo Nacional de Ciencias Naturales - CSIC. José Gutiérrez Abascal 2. 28006 Madrid. Spain, e-mail: rafael@mncn.csic.es

**Key words:** Unionoidea, history, taxonomy, phylogeography, conservation, breeding.

During the last years, the taxonomy of the West Palearctic Unionoids (freshwater mussels or naiads) is suffering important changes. Although Haas' book (1969) is still the Bible for the classification of these molluscs, the use of new molecular techniques is being a successful tool to unravel some historical problems in this polymorphic group. For instance, only in the Iberian Peninsula and North Africa, the following 7 species have been recently redescribed (in brackets the names used by Haas): *Margaritifera marocana* (*Pseudunio auricularia marocana*), *Unio gibbus* (*U. pictorum delphinus*), *U. tumidiformis* (*U. crassus batavus*), *U. delphinus* (*U. pictorum mucidus* and *U. p. delphinus*), *U. mancus* (*U. elongatulus aleroni* and *U. e. valentinus*), *U. ravoisieri* (*U. elongatulus penchinatianus*, *U. e. durieui* and *U. p. ravoisieri*) and *U. durieui* (*U. elongatulus durieui*).

After the presentation of the actual distribution and taxonomical status of the West Palearctic species, the second part of this lecture will be devoted to the advances in the conservation of freshwater mussels, one of the most imperilled animal groups on the planet. A summary of the efforts made in the recovery of the natural naiad populations by habitat improvement, captive breeding and/or restocking is presented. Once overviewed the pioneering and current North American projects to protect and recover endangered freshwater mussels, we will see some of the ongoing European programs, including the LIFE projects for species included in the Habitat Directive. Information on the naiad species, experiments, facilities, food and diets, host fishes and other variables is discussed.

**References:**

HAAS, F., 1969 - Superfamilia Unionacea. Das Tierreich, 88: 1-663.

# From early biological deep-sea expeditions to present investigations – results and perspectives

Angelika BRANDT

CeNak (Centre of Natural History) of the University of Hamburg, Germany. E-mail: abrandt@uni-hamburg.de

**Key words:** biodiversity, biogeography, deep sea, Crustacea, Isopoda

The presentation will point to the importance of research in the largest ecosystem on earth, the deep sea. It will span from early to present investigations using modern research vessels and give examples from own recent expeditions like the joint German/Russian expedition KuramBio (Kurile Kamchatka Biodiversity Studies) onboard of the R/V Sonne (SO 223) to the Kuril-Kamchatka Trench (KKT) and adjacent abyssal plain was performed from July 21st to September 7th, 2012.

Aims of the RV Sonne expedition to the Kuril-Kamchatka region were to investigate the biodiversity and community patterns of the meio-, macro- and megafauna for testing the following hypotheses: 1. Communities of the Kuril-Kamchatka stations differ in terms of species composition and richness. 2. The non-isolated abyssal plain of Kuril-Kamchatka area causes an increase of the abyssal biodiversity in comparison to the geographically more isolated Sea of Japan. 3. In the Kuril-Kamchatka Trench and abyssal plain we will sample around 50% of new species in different taxa. 4. The standardized sampling techniques will increase the faunistic knowledge about that region.

The KuramBio expedition with RV Sonne was the first extensive biological expedition in the abyssal plain of the Northwest Pacific since the RV Vityaz expeditions in the mid twentieth century (Bogorov, 1972). After more than 40 years of investigations, about 660 species were recorded in the collections of the Vityaz expeditions from the extensive area of the Northwest Pacific where the sampling depth ranged from bathyal to hadal. During the KuramBio expedition, we sampled a more restricted area with a depth range between 4,830 to 5,780 m by means of an epibenthic sledge and collected 85,651 invertebrates (23,432 invertebrates standardized for 1000 m²) which represent more than 1780 species. Of these, 869 species (~ 50%) are new to science and more than 90 of the known species are new for the area, while only about 300 species were known from the NW Pacific and the KKT area.

During the recent Vema-TRANSIT expedition, macrofauna was studied in the Atlantic. Transform faults and fracture zones characterize most of the seafloor bathymetry and the volcanic and tectonic processes create and modify the crust. During the cruise SO-237 we surveyed and sampled the major offsets of the Mid-Atlantic Ridge, the Vema Fracture Zone. Variations in benthic communities along this transect were investigated using a camera-epibenthic sledge. The results will help to test the hypothesis that the Mid-Atlantic Ridge serves as a barrier limiting benthic species distribution in the abyssal basins on both sides of the ridge. The Puerto Rico Trench is much deeper than the surrounding abyssal West Atlantic

and so, we also took samples there to determine whether the biodiversity of its hadal meio-, macro-, and megabenthic fauna differs from that of the abyssal Atlantic due to isolation of the trench.

**References:**

BOGOROV, V. G., 1972 - Fauna of the Kurile-Kamchatka Trench & its enviroment based on data of the 38th Cruise of the R/V "VITYAZ".

# Riding the infinity wave: operationalizing resilience principles in natural resource stewardship

Timothy J. EHLINGER

University of Wisconsin – Milwaukee, USA, Department of Biological Sciences and College of Nursing, e-mail: ehlinger@uwm.edu

**Key words:** complex systems, adaptive cycle, resilience, transdisciplinary learning.

The concept of sustainable development has been evolving for over 40 years from early ideas of steady-state resource management toward concepts of dynamic social-ecological systems and feedbacks among biophysical, social and institutional domains. Such paradigm shifts involve the transition from a "*focus on fixes*" that balance the trade-offs among "Triple Bottom Line" (i.e. "People, Planet, Prosperity") toward "*wrestling with resilience*" (i.e. engaging the capacity for systems to cope with uncertainty and adjust to unexpected changes). Addressing the problems of sustainability, resilience and vulnerability of the ecosystem services upon which society depends will require new policy frameworks that are capable of adaptive learning. This presentation will explore the utility of employing a system-based approach for "operationalizing" the practice of resilience-based management. Case studies from the Danube Delta, Black Sea Coast and mining zones of Gorj County Romania will be used to examine participatory mapping as a tool for developing a systems approach for visualizing the complex relationships between policy frameworks, environmental governance, human wellbeing, and resource stewardship. These analyses demonstrate the critical importance of fostering social learning and self-organization in promoting adaptive behavior for sustainable development.

# ABOL - The Austrian Barcode of Life-Initiative

Elisabeth HARING, Helmut SATTMANN, Nikolaus SZUCSICH

Naturhistorisches Museum Wien, Burgring 7, 1010 Vienna, e-mails: nikolaus.szucsich@nhm-wien.ac.at, elisabeth.haring@nhm-wien.ac.at, helmut.sattmann@nhm-wien.ac.at

**Key words:** DNA barcoding, Austrian barcode of life, biodiversity, national barcoding initiative.

DNA barcodes, representing species-specific parts of the genome, primarily approach the genetic aspects of biodiversity. Being collection-based, however, DNA barcoding holds all aspects of an integrative approach, which connects all aspects of biodiversity research. As an open-access initiative, DNA barcoding may be applied in many fields, including e.g. conservation, food control or forensics.

The Austrian Barcode of Life initiative ABOL started in July 2014, and aims to provide reference DNA barcodes for all species of fungi, plants and animals recorded from Austria. During the three year pilot phase of ABOL, data is collected in four groups of organisms: (i) vertebrates, (ii) butterflies and moths, (iii) molluscs, and (iv) parasitic worms. The overall project is planned to be organized in organism-specific clusters. DNA barcodes of taxa, currently not covered by the funding of the pilot phase of ABOL, are contributed by associated projects e.g., Apioninae (Curculionoidea, Coleoptera), lichenized Ascomycetes (*Caloplaca, Rinodina*), pill-millipedes (Glomerida: Myriapoda), primarily wingless insects (Protura, Diplura, Archaeognatha & Zygentoma), mosquitoes (Culicidae: Diptera), and true bugs (Heteroptera).

ABOL will not only raise biodiversity survey and documentation onto a new methodological level, but it will also boost evolutionary research and its public outreach essentially.

Constituting a platform for all Austrian experts dealing with all aspects of biodiversity research in Austria, ABOL is cross-linked with other initiatives, like GBOL in Germany, and SwissBOL in Switzerland at the national scale, and iBOL and ECBOL at the international scale. Harbouring the eastern part of the alpine arc, Austria is likewise of interest for the biodiversity landscape at the European level. The alpine arc constitutes a geographic barrier, which canalized the dynamics of expansion and shrinkage of distribution areas and, moreover, contained numerous smaller refuges during glaciation periods. Due to the geographic position of Austria comprising borders of different biogeographical regions, ABOL aims to induce similar projects in other European countries, and particularly to initiate a network with initiatives in Eastern and Southeastern Europe.

# Who cares about natural history collections?

Boris KRYŠTUFEK

Slovenian Museum of Natural History, Prešernova 20, SI-1000 Ljubljana, Slovenia, e-mail: bkrystufek@pms-lj.si

**Key words:** natural history museum, curatorship, biodiversity crisis.

We all agree that a high proportion of species is still not named and that great majority of them will remain unknown primarily because the extinction rate works against us. It is also axiomatic that natural history collections (NHC) are repositories of all life that we know has existed and that cataloguing world biodiversity is a specific museum mission. Furthermore, the service which Natural History Museums (NHM) provide to society is more complex and multi-fold, covering basic and applied research, education and conservation. Communities with a high level of scientific research tend to keep well curated NHCs and a high ranking university will more likely maintain its own NHM than a low ranking university. E.g. 7 universities of the 10 top ranking ones (QS World University Ranking) retain their own NHMs. Good NHMs therefore provide vital service to various needs of society and remain vibrant places in terms of ideas and knowledge transfer. How is it then possible that they face loss of scientific relevance, decrease in investments, and shortages of qualified personnel? How can it be that an increasing number of NHMs is no longer able to maintain adequate standards of curation and sufficient staff? The editorial in Nature (515: 311-2; 20 Nov. 2014) revealed and example of a highly developed EU country which neglects NHCs to a degree that "at least one-third of all biological specimens have been lost?" It became clear in a correspondence which followed that the situation in other countries on the EU periphery may be even much worse. What is perhaps the most disturbing in all this is the lack of any action which would follow such dramatic calls.

Why are we, taxonomists, collection managers and curators, so indifferent beyond our narrow scientific interest on NHCs? Why are we so content with our desolate existence? Why de we accept with no resistance and counterarguments the Procrustean restrictions posed on NHMs by cultural and historical museums? How can it be that we lack any sort of international organization which would advocate our interests?

# Why some species disappear and other expand? The example of the minks and the European otter

Johan MICHAUX

Conservation Genetics Laboratory of the University of Liège, e-mail: johan.michaux@ulg.ac.be

**Key words:** mink, European otter, polecat, global changes.

The present global changes have a strong impact on the survival of many species and on their demography and population dynamics. Some species have a strong reduction of their populations, following the fragmentation of their habitats, the competition with other species, different pollutions or the appearance of new diseases. In contrast, several other species tend to expand their distribution areas and can even be considered as invasive species in some cases. The aim of my presentation will be to better understand which biological factors could lead to decrease populations of a species until extinction or, in contrast, to help a species to expand its population densities and distribution area.

These hypotheses will be illustrated by our recent results obtained on the European mink (*Mustela lutreola*), the American mink (*Neovison vison*), the polecat (*Mustela putorius*) and the European otter (*Lutra lutra*).

# Evolution of reproductive genes and male traits in mammals

Eduardo ROLDAN, Maximiliano TOURMENTE,
María VAREA-SÁNCHEZ, Lena LÜKE

Reproductive Ecology and Biology Group, National Museum of Natural Sciences (CSIC), Madrid, Spain, e-mail: roldane@mncn.csic.es

**Key words:** reproductive proteins, sperm number, sperm size, sperm function, sexual selection, sperm competition.

There is an enormous diversity in male reproductive traits among mammals. Males from different species exhibit considerable variation in testes mass relative to body mass, which translates into differences in relative sperm numbers, as well as in the shape, size and function of spermatozoa. Both sperm numbers and sperm design are key determinants of successful reproduction. Postcopulatory sexual selection (in the form of sperm competition or cryptic female choice) is a powerful selective force that influences male's reproductive biology including sperm traits. Competition between spermatozoa occurs when females mate with different males in the same receptive period and rival sperm cells compete for fertilizations. Work carried out in our laboratory has concentrated, with rodents as the main focus of our attention, on the impact of sperm competition in the evolution of genes that control male reproductive function and on mammalian sperm form and function. A general response to sperm competition is an increase in the number of sperm produced and transferred to the female tract. An overall improvement of sperm quality (e.g., high percentages of motile and normal spermatozoa) is also observed. Sperm swimming velocity, which is crucial to negotiate barriers in the female tract, reach the site of fertilization and penetrate ovum vestments, is strongly related to the intensity of sperm competition. The velocity of spermatozoa is influenced by several factors, namely the morphology of the sperm head, sperm dimensions (the longer the sperm, the faster their speed), and ATP levels (required to fuel cell propulsion). Genes coding for proteins involved in reproductive function are under strong selective pressure. Among these genes, protamines are important for chromatin condensation and, thus, for determination of head morphology. Rodents have two types of protamines (PRM1 and PRM2) and the proportion between them seems crucial for normal sperm formation. We found that sperm competition influences evolution and regulation of these genes but in a very complex way.

# The American Giant Liver Fluke: heading further south toward the Black Sea

Helmut SATTMANN[1], Christoph HÖRWEG[1], Christian HUSCH[2], Julia WALOCHNIK[2]

[1]Natural History Museum Vienna, Burgring 7, 1010 Vienna, Austria, e-mails: helmut.sattmann@nhm-wien.ac.at; christoph.hoerweg@nhm-wien.ac.at
[2]Medical University Vienna, Institute of Specific Prophylaxis and Tropical Medicine, Kinderspitalgasse 15, 1090 Vienna, Austria, e-mails: a0805354@unet.univie.ac.at; julia.walochnik@meduniwien.ac.at

**Key words:** giant liver fluke, *Fascioloides magna*, invasive species, dispersal, distribution, Europe.

The giant liver fluke *Fascioloides magna*, an invasive trematode species (Digenea) originating from North America, was recorded in Europe for the first time in 1875 in Italy. Since the 1940s it was detected in several Central European countries with stable populations particularly in former Czechoslovakia. More recently, dispersal downwards the Danube valley has become apparent with findings in the 1990s in Slovakia and Hungary, in 2000 in Austria, in 2002 in Croatia and in 2008 in Serbia. *Galba truncatula*, an autochthonous snail, was proven to act as main intermediate host and red deer was reported to act as main final hosts. But also other lymnaeid snails are suitable intermediate hosts and several additional ungulate species may act as final hosts.

Molecular phylogenetic studies have revealed that the Czech populations have multiple origins. Recently, also for 26 adult worms collected from 13 cervids in the Austrian Danube floodplains the sequences of the conserved mitochondrial genes COX1 and NAD1 were obtained and compared with reference strains. All 26 samples, well covering the small Austrian distribution area of *F. magna*, proved to be genetically identical, namely of haplotype COX1-Ha3/ NAD1-Ha4. These haplotypes are also common in Czech Republic, Hungary, Slovakia and Croatia. Whilst the genetically much more diverse populations of the Czech Republic clearly suggest multiple invasions, our data indicate that the Austrian *F. magna* population is homogenous and might origin from one source or even from a single event of introduction. Similarly, the populations in Hungary, Slovakia and Croatia have been reported to display only low genetic diversity. These findings might be explained by an origin of the parasites from particular Czech populations and a spreading downstream the Danube valley. The invasive parasite can be expected to emerge also in Romania and Bulgaria.

The American Liver Fluke is an invader and the causative agent of an emerging disease. Besides deer, it might also affect domestic animals. Therefore, it must be considered to be of high economical and veterinary importance. The intermediate host snails are widely distributed in the entire Europe and rather abundant, particularly along flowing water bodies. Snails and parasite stages can easily be transported via water flow. Moreover, in suitable environments the deer hosts might be able to migrate over long distances. These facts facilitate the dispersal of the parasite. Therefore, attention should be directed towards

reporting, monitoring, epidemiological analyses and the ecology of this important invasive parasite.

# Climate change and biodiversity: two study cases

Víctor SÁNCHEZ-CORDERO[1]

[1]Department of Zoology, Institute of Biology, UNAM. Mexico, City, Mexico, e-mail: victor@ib.unam.mx

**Key words:** climate change impact, ecological niche modelling, risk maps, biodiversity conservation.

Climate change (CC) has a significant impact on biodiversity. Species will potentially shift their distributions to other regions holding more suitable environmental conditions, depending on dispersal capabilities. Here we quantify the expected impact of CC on biodiversity, considering two relevant topics: risk maps of emerging zoonotic diseases of human health importance, and selection of priority areas for conserving biodiversity. We modelled ecological niches of potential vectors and reservoirs of Chagas disease and leishmaniasis, projected as potential species distributions under current and CC scenarios. For both emerging diseases, vector and reservoir species showed significant geographical shifts northward into the USA. It is predicted that under CC, risk areas will result in wider geographical regions, affecting a significant higher human population than currently. Second, we modelled the ecological niches of all vertebrate species (as biodiversity surrogates) occurring in Mexico under current and CC scenarios, and developed a conservation area network model, including decreed Mexican protected areas. Current and CC conservation area networks show geographical differences due to terrestrial vertebrate species geographical shifts. These case studies show the importance of CC on biodiversity, particularly in a mega-diverse country as Mexico.

# Ancient Lake Ohrid: linking geological and biological evolution

Thomas WILKE

Justus Liebig University Giessen, Germany, e-mail: Tom.Wilke@allzool.bio.uni-giessen.de

**Key words:** ancient lake, evolution, deep drilling, paleolimnology, molecular clock.

Ancient Lake Ohrid on the Balkan Peninsula constitutes the oldest and most biodiverse freshwater lake in Europe. The processes generating this amazing species richness with a high share of endemic taxa, however, are not fully understood.

In order to unravel the age and origin of the lake, and to infer the driving forces of evolution of endemic taxa, an interdisciplinary deep drilling initiative – the SCOPSCO – program was launched. The project combines sedimentological, tephro-stratigraphical, seismic, and paleontological studies of lake sediment cores with molecular-dating and empirical modelling approaches applied to extant taxa.

Preliminary analyses of sediment core data from drill sites with a maximum penetration depth of 569 m below lake floor supplemented with seismic information indicate that Lake Ohrid is between 1.4 and 2.0 My old. These data reinforce the age estimations obtained by molecular clock analyses prior to the drilling operation. Moreover, combined evidence from geological, paleolimnological, and biological data suggest that the extraordinary biodiversity in Lake Ohrid is largely driven by: i) the long and continuous existence of the lake; ii) the lack of catastrophic events (e.g., desiccation, full glaciation or salinization) during its lifetime; iii) the high ecosystem resilience of the lake, and iv) distinct turnovers in species composition over time.

These findings not only shed new light on patterns and processes of biotic evolution in Lake Ohrid, they also stress the need for truly interdisciplinary approaches in studying patterns of biodiversity and the underlying evolutionary processes.

# ORAL PRESENTATIONS

# Towards a phylogeography of the Ponto-Caspian mollusks inhabiting the Azov-Black Sea Basin

Vitaliy ANISTRATENKO

Schmalhausen Institute of Zoology of NAS of Ukraine, B. Khmelnitsky Str. no. 15, 01601 Kiev, Ukraine, e-mail: anistrat@izan.kiev.ua

**Key words:** hydrobiids, biogeography, Ponto-Caspian faunal complex, Azov-Black Sea Basin.

Available data show that there is no close biogeographical affiliation between the endemic hydrobiid *Falsipyrgula* of Lake Egirdir in SW Anatolia and snails from Central Europe or the Balkan Region (Wilke et al., 2007; Anistratenko, 2008). Instead, there is a very close and relatively young (i.e., late Pleistocene) biogeographical relationship to the Ponto-Caspian subfamily Pyrgulinae. Fossil and comparative data from other invertebrates indicate that biogeographical connections between Lake Egirdir and the Ponto-Caspian region existed during different time frames, i.e., Miocene/Pliocene, early Pleistocene, and late Pleistocene.

A recent phylogenetic study based on mitochondrial DNA data suggested that the hydrobiid genus *Falsipyrgula* from Lake Egirdir and *Euxinipyrgula* inhabiting the Azov-Black Sea Basin are closely related. Both should be attributed to the Ponto-Caspian faunal complex. The Lake Egirdir itself might be considered as part of so called *Ancient Lakes* cluster in the western Taurus Lake District.

The analyses of the Ponto-Caspian taxa geographic range allow us to reveal an unexpected characteristic of their ecological preferences. It appears that widely distributed taxa (neritid, dreissenid, limnocardiid, genera *Caspiohydrobia*, *Caspia*, *Turricaspia* (=*Micromelania*), *Euxinipyrgula*) are rheophil brackish-water inhabitants that practically never occur in freshwater lakes (except genus *Dreissena*). At the same time, the narrow-ranged hydrobiid snails (namely *Pyrgula*, *Dianella*, *Chilopyrgula*, *Xestopyrgula*, *Ohridopyrgula*, *Macedopyrgula*, *Prespopyrgula, Falsipyrgula* and others) inhabit such lakes as Garda, Ohrid, Prespa, Egirdir etc. but never occur in current brackish waters.

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# Plasticity in fecundity highlights the females' importance in the spiny-cheek crayfish invasion mechanism

Lucian PÂRVULESCU[1], Mălina PÎRVU[1],
Loredana-Giorgiana MOROȘAN[1], Claudia ZAHARIA[2]

[1]Department of Biology-Chemistry, Faculty of Chemistry, Biology, Geography, West University of Timișoara, 16A Pestalozzi St., 300115 Timișoara, Romania, e-mail: lucian.parvulescu@e-uvt.ro
[2]Department of Mathematics, Faculty of Mathematics and Computer Science, West University of Timișoara, V. Pârvan Blvd, 300223 Timișoara, Romania

**Key words:** colonisation, invasive species, oocytes, *Orconectes limosus*, population dynamics.

Invasion is one of the most consequential phenomena affecting the distribution of native species. Few in number of species, European crayfish are losing the competition with introduced North American crayfish. The spiny-cheek crayfish, *Orconectes limosus*, is an outstanding example, successfully competing against the native narrow-clawed crayfish, *Astacus leptodactylus*. For four years, we collected data regarding crayfish occurrences, their relative abundance, and the structure of populations in the ongoing colonisation process of *O. limosus* in the lower Danube. The mature females of both invasive and indigenous crayfish species were analysed with respect to biometry and production of oocytes in relation to the dynamics of invasion. The interspecific comparisons showed no significant differences regarding body size, with an average of approximately 102 mm total length and 31 g wet weight for both species. However, the fecundity of the indigenous species was found to be constant throughout the investigated area, whereas the number of eggs produced by the invasive females was significantly increased at the active front of the invasion. The maximum number of ovarian eggs found was 887 and 1156 in the indigenous species and the invasive species, respectively. We propose the scenario that the invasive species, which carries the deadly crayfish plague, creates an ecological advantage by reducing the populations of indigenous crayfish. Subsequently, the invasive females opportunistically use the available resources to enhance their fecundity, resulting in the acute growth of populations. However, the long-term competitiveness and colonisation success of *O. limosus* still remain in question.

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# More than fifty years after the last recording of *Leucorrhinia pectoralis* (Charpentier, 1825) (Odonata: Libellulidae) in Romania

Cosmin Ovidiu MANCI[1], Irinel Eugen POPESCU[2]

[1]"Oceanic-Club", 41 Decebal Str. Constanţa, Romania, e-mail: cosminovidiu@yahoo.com
[2]"Alexandru Ioan Cuza" University, Faculty of Biology, 11 Carol I Str., 700506 Iaşi, Romania, e-mail: irinellus@yahoo.com

**Key words:** Odonata, Libellulidae, *Leucorrhinia pectoralis*, distribution, nature conservation, indicators, Romania.

*Leucorrhinia pectoralis* is included in the Bern Convention (Appendix II), the Habitats Directive (Council Directive 92/43/EEC) (Annexes II and IV), the IUCN European Red List of Dragonflies (LC category) and in the IUCN Red List of Mediterranean dragonflies (LC category). *L. pectoralis* is the largest European species of the genus *Leucorrhinia* with 32-45 mm in body length. It has Euro-Siberian distribution which declined sharply, especially in the westernmost portions of its range where it becomes uncommon with small and scattered populations (Macagno et al., 2012). *L. pectoralis* is associated with densely vegetated habitats, with mesotrophic to eumesotrophic, still or slow flowing acidic or neutral water and medium stages of vegetation succession. A typical environment for this species is represented by peatlands, a habitat that is in decline and in need of special protection in Europe.

*Leucorrhinia pectoralis* is mentioned in Romania in two Natura 2000 sites: "Coridorul Jiului" (ROSCI0045) and "Tinovul Mare Poiana Stampei" (ROSCI0247) (Cîrdei & Bulimar, 1965). A recent investigation of the first author in ROSCI0045 was negative about the presence of the species here. In the Cîrdei & Bulimar collection of Faculty of Biology from "Alexandru Ioan Cuza" University from Iaşi we found one female of *L. pectoralis* labeled "Panaci 1949". This locality is in vicinity of ROSCI0249 "Tinovul Şarul Dornei", but recent investigation of the first author here was also negative.

In the summer of 2014 we investigated the ROSCI0247 "Tinovul Mare Poiana Stampei" and identified two males of *L. pectoralis*. Habitat support for this species in this site is not very favorable because of rare and small ponds not suitable for larvae development. At 4.5 kilometers from this protected area we found in the same period several dozen specimens of *L. pectoralis* in an exploited area for peat, called "TURBAMIN", this being an example when human activities contributed accidentally to maintaining a protected, rare species in nature. It might be a case of a metapopulation and we recommend some conservation actions. The ponds from the exploited area must be maintained and for "Tinovul Mare Poiana Stampei" we recommend some artificial small breeding ponds to be made, 1-1.5 m deep, with sun exposed vegetation along the banks and with peat as preferable sediment, located in vicinity and inside the forest.

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# Second confirmed station for *Carabus hungaricus* (Fabricius, 1792) (Coleoptera: Carabidae) in Romania

Irinel Eugen POPESCU[1], Ionuț Ștefan IORGU[2]

[1]"Alexandru Ioan Cuza" University, Faculty of Biology, 11 Carol I Str., 700506 Iaşi, Romania, e-mail: irinellus@yahoo.com
[2]"Grigore Antipa" National Museum of Natural History, 1 Kiseleff Str., 011341 Bucharest 1, Romania, e-mail: ionut.iorgu@antipa.ro

**Key words:** Coleoptera, Carabidae, *Carabus hungaricus*, distribution, nature conservation, indicators, Romania.

*Carabus hungaricus* is a typical steppic species distributed from Central Europe to Eastern Siberia and is declining throughout its range, sharing the fate of the temperate grasslands that are among the most threatened biomes on Earth. This thermophile beetle inhabits dry calcareous, loess and sand grasslands, from lowlands up to nearly 600 m altitude in the Carpathian Basin. Steppic grasslands are considered regional biodiversity hotspots, being drastically affected by agricultural intensification. *C. hungaricus* is listed in the Habitats Directive (Council Directive 92/43/EEC) (Annexes II and IV) and is protected in most countries of occurrence. In Europe, it was found in Austria, Czech Republic, Hungary, Serbia, Slovakia, Bulgaria, Moldova, Romania, Russia and Ukraine, but it is near extinction in the Czech Republic, Slovakia and Austria and even in Hungary its populations are isolated and fragmented (Pokluda et al., 2012).

*Carabus hungaricus* is mentioned in Romania in four Natura 2000 sites: "Ciuperceni-Desa" (ROSCI0039), "Coridorul Jiului" (ROSCI0045), "Mlaştina Satchinez" (ROSCI0115) and "Silvostepa Olteniei" (ROSCI0202). Unfortunately no research confirms the current existence of the species in these sites (Barloy et al., 2008; Barloy & Prunar, 2012a; Barloy & Prunar, 2012b).

*Carabus hungaricus frivaldskyanus* was described by Breuning in 1933 after three specimens were collected at Maşloc-Remetea Mică (Timişoara) and Deliblat (Serbian Banat - Vojvoidina), only one specimen having the collecting date 7.06.1907, these specimens being now in the Breuning collection from Amsterdam University (Lie, 1996). No other specimens were recorded in Banat or in any other part of Romania and no material was found in the collections of Romanian museums (Lie, 1996). In 1993-1994 Lie (Lie, 1995; Lie, 1996) captured 105 exemplars in a xerophyte meadow with *Robinia pseudaccacia* using Barber pitfall traps (forest "Şemiţa", between Jamu-Mare and Lăţunaş, Banat, Timiş County), this being a rediscovery and a confirmation of the presence of *C. hungaricus* in Banat and Romania. In the spring of 2014 we captured one female of *C. hungaricus* in "Coridorul Jiului" Natura 2000 site (ROSCI0045), near Murta locality (Dolj County), in an area with sand grasslands, this being the second confirmed station for *C. hungaricus* in Romania. The specimen was

donated to “Grigore Antipa” National Museum of Natural History Bucharest, Romania.

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# New and rare Macrolepidoptera from Romanian Dobrogea (SE-Romania)

Levente SZÉKELY

Bd. Braşovului, no.297, 505600, Săcele, Jud. Braşov, Romania, email: levi.szekely@gmail.com

**Key words:** Insecta, Macrolepidoptera, faunistics, zoogeography, invasive species, conservation, Dobrogea, Romania

This study represents a synthesis of recent faunistical results (2012-2015) regarding the Macrolepidoptera of Dobrogea, including new data from those old (Székely, 2011, 2012). Records of species of great faunistical and zoogeographical importance for the Romanian fauna are included. *Eublemma porphyrinia* (Freyer, 1845) is reported for the first time in the Romanian fauna. The presence of *Dryobotodes carbonis* (F. Wagner, 1831) and *Eremodrina pertinax* (Staudinger, 1879) is confirmed in Romania, until the present based only on old data (Rákosy, 1996).

Some species known in the country based exclusively on very old records is confirmed: *Zekelita antiqualis* (Hübner, [1809]), *E. pertinax* (Staudinger, 1879) etc. Certain rare species, known in very few records, are also presented: *Catopta thrips* (Hübner, 1818), *Sphingonaepiopsis gorgoniades* (Hübner, 1819), *Saturnia pavonia* (Linnaeus, 1758), *Grammodes bifasciata* (Petagna, 1787), *Clytie syriaca* (Bugnion, 1837), *Symira dentinosa* Freyer, 1839, *Amphipyra tetra* (Fabricius, 1787), *Chazaria incarnata* (Freyer, 1838), *Mormo maura* (Linnaeus, 1758), *Protarchanara brevilinea* (Fenn, 1864), *Polymixis rufocincta* (Geyer, [1828]), *Gortyna cervago* Eversmann, 1844, *Dichagyris melanura* (Kollar, 1846), *Polyommatus (Agrodiaetus) admetus* (Esper, 1783), *Libythea celtis* (Laicharting, 1782), *Kirinia roxelana* (Cramer, 1777) etc.

Several Macrolepidoptera species recorded for the first time in Dobrogea are also included: *Hyloicus pinastri* (Linnaeus, 1758), *Cyclophora quercimontaria* (Bastelberger, 1897), *Perconia strigillaria* (Hübner, 1787), *D. carbonis* (F. Wagner, 1831), *Meganephria bimaculosa* (Linnaeus, 1767), *Cerastis leucographa* ([Denis & Schiffermüller], 1775), *Noctua janthe* (Borkhausen, 1792).

There are 602 Macrolepidoptera species listed in this work. The studied localities/sites that have not been previously investigated in terms of Lepidoptera fauna: Creasta Cardonului-Hamcearca, Tulcea County (45.0965 N, 28.3882 E), Enisala, Tulcea County (44.8853 N, 28.8194 E), Fântâniţa-Murfatlar, Constanţa County (44.1602 N, 28.3885 E), Allah Bair hill, Constanţa County (44.2946 N, 28.1309 E), Esechioi forest, Constanţa County (44.0181 N, 27.4107 E), Oltina, Constanţa County (44.1128 N, 27.6646 E), Şipotele, Constanţa County (44.0215 N, 27.9861 E). The study also includes aspects of zoogeography, invasive species, protection of habitats and protection of endangered species.

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# First record of the dacetine ant *Strumigenys argiola* (Hymenoptera: Formicidae) from Romania

Ioan TĂUŞAN[1], Alexandru PINTILIOAIE[2]

[1] "Lucian Blaga" University of Sibiu, Dr. Ion Rațiu, 5-7, 50012, Sibiu Romania, e-mail: itausan@gmail.com
[2] "Alexandru Ioan Cuza" University, Iaşi, Bd. Carol I, 20A, 700505, Romania, e-mail: alexaandru2009@gmail.com

**Key words:** first record, faunistics, myrmecofauna, check-list, Romania.

Dacetini ants are a tribe of small predatory ants in the subfamily Myrmicinae. The tribe is large and diverse, containing more than 900 species in eight genera, most of them tropical or subtropical (Garcia et al., 2013). The genus *Strumigenys* (*sensu lato*) includes both, the genus *Strumigen*ys Smith and the former genus *Pyramica* Roger, which was revently proposed as junior synonym of *Strumigenys* (Baroni Urbani & De Andrade, 2007).

The Romanian ant fauna is poorly known, mostly cryptic, sub-Mediterranean and parasitic species missing from the checklist. Until now, the only dacetine ant known from Romania was *Strumigenys baudeuri* (Emery, 1875). Herein, *Strumigenys argiola* (Emery, 1869) is newly recorded for the ant fauna of Romania. One male was collected in Comănești (Bacău), North-Eastern Romania, from a ruderal habitat. *Strumigenys argiola* lives in the soil and hunts for small arthropods (Garcia et al., 2013). In Europe, the species occurs in France, Turkey (European part), Greece, Hungary, Italy, Portugal, Spain, Serbia, Montenegro and now in Romania.

The new finding adds to the list of Romania's ant fauna that comprises until now 111 ant species. However, this number is expected to be much higher due to Romania's geographical position and diversity of habitats.

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# New herpetological records from Cozia National Park

Alexandru IFTIME[1], Oana IFTIME[2]

[1]"Grigore Antipa" National Museum of Natural History, Şos. Kiseleff no. 1, 011341 Bucharest 2, Romania, e-mail: aiftime@antipa.ro
[2]Department of Genetics, Faculty of Biology - University of Bucharest, Aleea Portocalelor 1-3 060101 sector 6, Bucharest, Romania, e-mail: oiftime@gmail.com

**Key words:** Cozia National Park, amphibians, reptiles, records, confirmation.

The Cozia National Park encompasses a large variety of natural habitats and has been previously studied (Iftime & Iftime, 2006, 2007) and shown to have a rich and diverse herpetofauna. However, our previous studies have only focused on part of the Cozia massif. We subsequently extended the range of investigated habitats to the whole of the Cozia massif as well as the facing Narâțu massif, also situated in the national park.

Our recent results comprise new records for many of the previously identified species, including the localized, thermophilic lizard *Darevskia praticola*. We have also found in the area *Emys orbicularis*, which was quoted as present previous to our initial studies but not recorded then by us. Also, we record *Zootoca vivipara*, not previously known in the Cozia massif, and present new data on the distribution of the „green frogs" in the *Pelophylax* genus (*P. ridibundus*, *P. lessonae* and the hybridogenetic *P.* kl. *esculentus*) in the national park and adjacent areas.

We also note that some of the species previously recorded by us were not found during this investigation. Possible causes are discussed, along with the impact of natural and artificial disrupting factors that negatively influence amphibian and reptile populations within the park.

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# An assessment of *Emys orbicularis* online trade in Romania - a threat factor for conservation

George-Ioan MĂRGINEAN, Elena GHERMAN

University for Medicine and Pharmacy "Iuliu Haţieganu" Cluj-Napoca, Romania, e-mail: geomarginean@yahoo.com

**Key words:** online trade, *Emys orbicularis*, illegal pet trade, conservation.

The reptile pet trade in the European Union was estimated at around $ 4.3 million in 2010. Amongst the traded species, aquatic turtles are a favorite, being traded for food, traditional medicine and especially as pets. While the legal pet trade with aquatic turtles in Romania is focused almost exclusively on exotic species such as *Graptemys* sp. and *Trachemys* sp., the illegal pet trade with aquatic turtles is composed of locally wild caught individuals of *Emys orbicularis*. This illegal trade has increased in the last years.

In the present study, we have attempted to illustrate the size of the pet trade with wild caught *Emys orbicularis* in Romania and the impact on the conservation efforts of this endangered species.

During the period 04.2013-05.2015 we have actively searched for offers regarding *Emys orbicularis* individuals on the main Romanian commerce websites. We have recorded a number of 88 online trade offers, resulting in a total number of at least 140 sold individuals of this protected species.

The illegal online trade with *Emys orbicularis* is a threat factor to the conservation of this species and must be urgently addressed. We have made several recommendations and proposed a few solutions for this problem.

# The Blotched Snake (*Elaphe sauromates*) in Dobrudja: How rare this species really is?

Marian TUDOR, Alexandra TELEA, Dragoş BĂLĂŞOIU

[1]"Ovidius" University of Constanţa, Faculty of Natural and Agricultural Sciences, Department of Natural Sciences, Aleea Universităţii nr. 1, corpul B, Constanţa 900470, Romania, e-mail: mariantudor04@gmail.com

**Key words:** Blotched snake, Dobrudja, occurrence, new records, detectability.

Iconic species for the south-eastern part of Romania, *Elaphe sauromates* has been rarely mentioned in literature. Its distribution, in Dobrudja at least, has been limited to sporadic references to isolated individuals, especially in the historical locations, places where the species has been mentioned more or less continuously over the past 80 years. The distribution of the species raises several question marks, especially since both the biology and ecology of the Blotched Snake are less known and, consequently, the species detectability is extremely low. Moreover, the bibliographical data are full of incomplete information, often contradictory, which leads to a poor understanding of the activity pattern of this species, in direct correlation with the detection probability.

Beginning with the autumn of 2012, and based on positive identifications of the species at dates and locations never mentioned before in literature, we established an intensive search program for *E. sauromates*. This search resulted in a better understanding of the ecology of the Blotched Snake, and subsequently in a more and more rapid accumulation of data that have led to the identification of over 60 individuals in no less than 42 new locations.

Cumulated, our data show a much wider occurrence of this species in Dobrudja, especially in the southern half of Constanta county. Moreover, the presence of individuals of both sexes, from all age groups, and even of hatched clutches, leads us to believe that, in some of these locations, the persistence of viable populations is more than probable.

# Importance of Common Pheasant (*Phasianus colchicus*) for the game fauna of Moldova

Anastasia LUNGU-BUCȘAN, Anatol SAVIN, Victoria NISTREANU

Institute of Zoology of Academy of Sciences of Moldova, Academiei str, 1, Chisinau, MD-2028, e-mail: anastasiabucsan@yahoo.com

**Key words:** pheasant, species, population, diversity, ecological, density

The pheasant is considered a naturalized species, across the plains and hills in the country. Pheasant is a sedentary bird. It represents an increased interest as game bird and it was the main reason for its introduction in our country's avifauna. This species is remarkable for its important role in nature as useful for agriculture by eating pest insect and weed seeds, and through the contribution to the fauna-diversity, as well as important object for the hunting funds. In spring the breeding bird numbers are slightly decreased, affected by the presence of predators and heavy winters.

To increase the density of pheasants, during the previous years about 9000 - 20,000 thousand individuals were released from farms annually, and since 2013, the hunting areas were populated with young pheasant from Romania and Hungary to strengthen the genetic status of local populations. 9-11 thousand individuals are extracted during hunting season annually, which represents about 50% of the population of released pheasant and less than 20% of the natural population.

In the ecological conditions of our country, the common pheasant is an important game species, with significant prospects for conservation of species diversity by weakening the hunt pressure upon autochthone species.

# New data regarding the status and distribution of Horseshoe bats (genus *Rhinolophus*) in karst areas of Southern Romania

Szilárd BÜCS[1], István CSŐSZ[1], Csaba JÉRE[1], Csabax BARTHA[1], Farkas SZODORAY-PARÁDI[1], Alexandra TELEA[1], Dragoș BĂLĂȘOIU[1], Teodora SINCULEȚ[2]

[1]Romanian Bat Protection Association, Str. I. B. Deleanu nr. 2, 440014 Satu Mare, Romania, e-mails: szilard_bux@yahoo.com, styepan@freemail.hu, csaba.jere@aplr.ro, barthacsabi@gmail.com, farkas@aplr.ro, alexandra.telea@gmail.com, contact@dragosb.com
[2]Exploratorii Cavers Club, Str. Sportului nr 5., 320110 Reșița, Romania, e-mails: alina_sinculet@yahoo.com

**Key words:** *Rhinolophus*, vulnerable, colonies, conservation, Southern Romania, caves.

In the period 2014-2015, during the project "Protecting the horseshoe bats in Romania", financed by the Conservation Leadership Programme, we surveyed 52 roosts in Southern Romanian karst areas. Using standard bat survey methods, we identified 24 key sites that offer roost to large colonies and/or to a diverse bat fauna. Out of the Romanian 31 bat species, we identified 20, including all five Horseshoe bat species. In case of the vulnerable Méhely's Horseshoe bat (*Rhinolophus mehelyi*) we demonstrated the permanent, year-round presence of the species in South-Western Romania, in two locations (Adam Pothole, Gaura Ungurului Cave de la Pecenișca, Cernei Mts.), with a series of bat research methods. Based also on previous studies, Gaura Ungurului Cave de la Pecenișca seems to be one of the most diverse bat roosts in Romania, with a minimum of 15 bat species present throughout the year, including uniquely all five Horseshoe bat species. We also found *R. mehelyi* to be present in one new site in South-Eastern Romania. Our survey highlighted key sites in Southern Romania with continental importance for bats. Buhui cave (Aninei Mts.) is home to a bat fauna of minimum 12 bat species, and more than 5,500 bats during hibernation. In Topolnița cave (Mehedinți Plateau), we have identified one of the largest greater horseshoe bat (*R. ferrumequinum*) colonies of Europe, with over 7,400 bats forming the colony. Other key sites, with colonies/aggregations of high importance include the Cloșani, Epuran, Șălitrari and Limanu caves. The office of the Forestry district Sasca Montană houses the largest building dwelling colony (350 bats) of *Rhinolophus ferrumequinum* in Romania, together with 200 medium sized Horseshoe bats and 200 Geoffroy's bats (*Myotis emarginatus*). Key sites require strict protection and durable management, by controlling tourism in sensible periods, as well as protection of surrounding habitats.

# Researches on Bat presence in some valleys and natural protected areas of Dolomites Mountains, Unesco World Heritage, region Veneto (N.E. Italy)

Edoardo VERNIER[1], Bronisław W. WOŁOSZYN[2]

[1]Società Naturalisti Padova, aggr. Federazione Nazionale Pro Natura, Italy; Private Office: via delle Palme 20/1, 35137 Padova, Italy; e-mail: e.vernier@libero.it
[2]Chiropterological Information Center, Institute of Systematics and Evolution of Animals, Polish Academy of Sciences, 31-016 Krakow, Slawkowska p.17, Poland; e-mail: woloszbr@isez.pan.krakow.pl

**Key words:** Bats, Bat distribution, Dolomiti, *Vespertilio murinus*, *Myotis myotis*, Veneto.

Placed in Italian Alps, the Dolomites Mountains are considered so beautiful and interesting to obtain the status of UNESCO World Heritage List in 2009, thanks to their outstanding beauty and their unique landscapes as well as to their incomparable geological and geo-morphological features. The property nominated as a Heritage Site covers an area of approximately 142,000 hectares, with a buffer zone of 85,000 hectares (total area: 231,000 hectares), all within the provinces of Trento, Bolzano, Belluno, Pordenone and Udine (N.E.Italy). An important part of these protected areas is placed in the region Veneto, in the province of Belluno.

For a long time, Dolomites Mountain areas received little attention for bat researches, but in the last 20 years several studies gave some new interesting data.

Recent researches in the National Park of Dolomiti Bellunesi (in Province of Belluno) gave information on presence of bats also in high karstic areas (Piani Eterni), where a very important karstic system (25 km long, more caves connected) was discovered and mapped by spelunkers and geologists in the last 10 years. In this cold cave habitat, single specimens and little groups of *Myotis myotis* were recorded. For the National Park of Dolomiti Bellunesi, the following bat species were found: *Rhinolophus ferrumequinum*, *Pipistrellus pipistrellus*, *P. kuhlii*, *M. myotis*, *M. daubentonii*, *M. nattereri*, *M. mystacinus*, *Eptesicus serotinus*, *Plecotus auritus*, *P. austriacus*, *Tadarida teniotis*.

For Boite Rriver valley (in Province of Belluno) in the municipality of Cortina d'Ampezzo, the north border (Natural Park of the Ampezzo Dolomites) represents the first site for *Vespertilio murinus* and *E. nilssonii* in the region Veneto. Within the last ten years, *V. murinus* appears moving southward (from 1300-1400 m to 1000 m a.s.l. localities); in lower parts of the Boite River valley (1000-800 m a.s.l.), *P. pipistrellus*, *E. serotinus*, *M. blythii*, *Barbastella barbastellus* were recorded.

# A preliminary study on distribution and biodiversity of small mammals from the foothills of the Sierra de Guara Range (Huesca province, Spain)

Bronisław W. WOŁOSZYN, Roksana SOCHA

Chiropterological Information Center Institute of Systematics and Evolution of Animals, Polish Academy of Sciences, Sławkowska 17, 31-016 Krakow, Poland; e-mails: bwwoloszyn@gmail.com, roksana.socha@gmail.com

**Key words:** Spain, Sierra de Guara, small mammals, distribution, biodiversity.

Sierra de Guara is a range of Prepyrenees Mountains massif in the Huesca Province, Spain. Much of the massif is now under protection of the natural park Parque de la Sierra y Caňones de Guara. There are over 50 small towns and villages in the Mountains. Most of them are actually abandoned or with a very limited number of inhabitants. Almost in all of these settlements, old churches and towers are frequently inhabited by owls, mainly by Barn Owl, *Tyto alba* (Scopoli, 1769). Forty samples of owl pellets were taken from this area. The majority of the samples are from the plateau and slopes of the mountains, from an altitude of 500 to about 1200 m. a.s.l.

Nineteen micromammal species of Insectivora, Chiroptera and Rodentia were identified from the owl pellets. Twelve species of insectivores and rodents from nine localities are subject of a quantitative study of their biodiversity.

Biological diversity of micromammals of the Sierra de Guara Mountains estimated at the alfa level has proved to be the highest in rather urbanized south-western part of the studied area. It is most likely related to the diversified landscape further modified by the agriculture.

The Northern part of Sierra de Guara Mountains is much less changed by human activity. Here, the biodiversity at the beta level is higher. Also, all the species compound in northern localities are much alike, while in the southern part it tends to differ markedly.

The differences between the southern and northern mountain slopes micromammalian fauna of the Sierra de Guara might income from several causes that are rather related with each other. Localities in the northern part of the Sierra de Guara are situated *ca*. 150 m higher than those studied in the south of the range. It can be noticed that in the southern region of the Sierra de Guara rodents outnumber insectivores. Probable causes here may be also the stronger human influence on the landscape in southern region of the range.

# How to learn about population history – an inference from genetic data

Adam KONEČNÝ

Vertebrate Research Group, Department of Botany and Zoology, Faculty of Science, Masaryk University, Brno, Czech Republic, e-mail: konecny@sci.muni.cz

**Key words:** ABC, population genetics, *Rattus rattus*, Senegal.

Knowledge of population or species history is of critical importance for both theoretical concepts of evolutionary biology and molecular ecology, and applications in management of animal populations, for example invasive species or those of conservation concern. Although many statistical tools implementing Bayesian concepts have been used in evolutionary and ecological science for several decades, since the beginning of this century (Beaumont et al., 2002) there is a new powerful approach becoming more and more used by biologists: Approximate Bayesian Computation (ABC).

Motivated by the growth in computational power and amount of available genetic data, ABC allows substantial model complexity, especially in the case of more numerous parameters, models and data, than could be dealt with standard likelihood-based algorithms. The ABC approach is based on coalescent theory and comparison of real datasets with those simulated under designed scenarios (consisting of different combinations of parameters). It has been recently used for inferring various scenarios of demographic history, as well as estimation of population characteristics, such as effective population size, time of divergence, strength of bottlenecks, etc.

In this contribution, the principles and use of ABC will be presented using an example of revealing colonization history of Senegal by the black rat (*Rattus rattus*) from genetic data.

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# Description of new species with a key to identification of the genus *Timalinyssus* Mironov, 2001 (Acarina, Psoroptidia)

Ioana Cristina CONSTANTINESCU[1], Gabriel CHIŞAMERA[1], D. Khlur B. MUKHIM[2], Chrysanthemum MASSAR[2], Costică ADAM[1]

[1]"Grigore Antipa" National Museum of Natural History, Şos. Kiseleff no. 1, 011341 Bucharest 2, Romania, e-mails: cristinactinescu@yahoo.com, gabriel_chisamera@antipa.ro, cadam@antipa.ro
[2]Lady Keane College, 793001 Shillong, Meghalaya, India, e-mails: khlur678@gmail.com, ladykeanecollege@gmail.com

**Key words:** Pteronyssidae, *Timalinyssus,* new species, systematics.

The article describes a new species of the feather mite family Pteronyssidae (Acarina: Psoroptidia) from the Gray Sibia *Heterophasia gracilis* (McClelland, 1840) (Passeriformes, Leiothrichidae) in India (Meghalaya, Jaintia Hills, Shnongrim village).

Males of ***Timalinyssus* sp. n.** differ from all *Timalinyssus* species by having horseshoe-shaped epiandrum with short anterior extension. Females of the new species differ from all the other five described females of the genus due to the shape of the hysteronotal shield that has lateral margins with deep incisions between *e2* and *f2* setae. A key of all species of the genus *Timalinyssus* is presented.

# Phylogenetic analysis and species discrimination within *Spalangia* Latreille (Hymenoptera, Chalcidoidea, Pteromalidae), using molecular data and morphological characters

Lucian FUSU, Mădălina I. VICIRIUC, Maria-Magdalena DASCĂLU, Ovidiu A. POPOVICI, Mircea D. MITROIU

Alexandru Ioan Cuza University, Faculty of Biology, 11 Carol I Blvd, 700506, Iaşi, ROMANIA
lucfusu@hotmail.com

**Key words:** parasitoid, synanthropic flies, DNA barcoding, phylogeny.

Species discrimination within *Spalangia* Latreille (Hymenoptera, Chalcidoidea, Pteromalidae) was assessed using molecular data and morphological characters. The molecular dataset consisted of the D2 and D3 expansion regions of the 28S rDNA gene and a fragment of the cytochrome C oxidase subunit I (COI) gene, largely overlapping with the standard barcode region amplified using the Folmer primers. Molecular phylogenetic analyses using the 28S rDNA gene mostly support species discrimination based on morphological characters and the DNA barcoding approach. Of the three cases where putative cryptic species were detected based on the mtDNA and weak morphological characters, only one is highly supported by the phylogenetic analysis of the nuclear gene. *Spalangia simplex* Perkins is represented by six mtDNA clades (four from Congo and two from South Korea) confirmed by the 28S rDNA phylogeny, and some of them also by morphological characters. Although specimens of *S. nigripes* Curtis and *S. fuscipes* Nees from Greece are molecularly very distinct on the COI sequences from those in Central or Eastern Europe and they are only weakly differentiated on the 28S rDNA sequences. This finding is difficult to interpret taxonomically, as sometimes cryptic species of parasitic hymenoptera are indistinguishable based on the 28S rDNA, while being good biological species. Overall, the phylogenetic analysis of the nuclear gene and subtle morphological characters support the cryptic species firstly detected using COI sequences.

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# Assesing haplotype diversity in the mountainous species *Pholidoptera transsylvanica*

Elena Iulia IORGU, Ionuț Ștefan IORGU[1],
Mihaela Isabela VADANA[1], Larisa-Bianca DUMITRESCU[1],
Alexandra Florina LEVĂRDĂ-POPA[1], Ana-Maria KRAPAL[1],
Oana Paula POPA[1], Anton KRIŠTÍN[2], Luis Ovidiu POPA[1]

[1]"Grigore Antipa" National Museum of Natural History, Kiseleff street, no. 1, 011341 Bucharest 1, Romania, e-mails: elenap@antipa.ro; ionut.iorgu@antipa.ro; mvadana@antipa.ro; larisad@antipa.ro; ana.krapal@antipa.ro; alexandra.levarda@antipa.ro; oppopa@antipa.ro; popaluis@antipa.ro
[2] Institute of Forest Ecology SAS, Ľ. Štúra 2, Zvolen, Slovakia, e-mail: kristin@savzv.sk

**Key words:** mitochondrial DNA, Orthoptera, alpine species

*Pholidoptera transsylvanica* is a brachypterous bushcricket, mostly carnivorous and with a relatively wide ecological valence. It prefers high grass vegetation in the ecotonal zone of forest edges (oak, beech, mixed, spruce), in alpine and subalpine meadows, at altitudes between 250 to 2300m. The species has Paleoaegeic and Ponto-Mediteraneean origin and is endemic to the Carpathian Mountains, being found from North-East Slovakia to East Serbia. Most populations of this species are located in Romania. It is protected in Romania and Europe being listed in Annex II and IV of the Habitats Directive. In Romania, the populations of *P. transsylvanica* are grouped in isolated meta-populations belonging to different mountain ranges.

We analyzed an 807 bp fragment of the mitochondrial COI gene from 97 specimens of *P. transsylvanica* from 29 sites located in different regions of the Carpathians. The haplotype diversity and genetic distances analysis revealed two major haplogroups found in the studied areas. The first haplogroup is distributed in the eastern part of the Southern Carpathians and Apuseni Mountains, while the second haplogroup is found mainly in the western part of Southern Carpathians and entire area in Slovakia

Phylogeographic studies may have major consequences in conservation strategies of a species by identifying populations or communities with high genetic diversity (the so-called Evolutionary Significant Units - ESU) and / or by identifying potential biodiversity refugia.

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# The presence of *Elephas antiquus* (Proboscidea: Elephantidae) in the Pleistocene of the Dacian Basin (Southern Romania) – preliminary results

Radu-Mihai ILIE[1, 2], Dragoş PANAITESCU[1],
Ştefan VASILE[1], Mirela DRAGOŞ[3]

[1]University of Bucharest, Faculty of Geology and Geophysics, Department of Geology, Laboratory of Paleontology, 1 Nicolae Bălcescu Avenue, 010041 Bucharest 1, Romania, e-mails: radduilie@yahoo.com; dragospanaitescu@gmail.com; yokozuna_uz@yahoo.com
[2]S.C. Prospecţiuni S.A., 1 Caransebeş St., 012271 Bucharest, Romania.
[3]"Grigore Antipa" National Museum of Natural History, Şos. Kiseleff no. 1, 011341 Bucharest 2, Romania, e-mail: mir.dragos25@gmail.com

**Key words:** straight-tusked elephant, Middle Pleistocene, Romanian occurrences, Dacian Basin.

The straight-tusked elephant, *Elephas antiquus* Falconer & Cautley, 1847, is, alongside the steppe mammoth, *Mammuthus trogontherii* (Pohlig, 1888), the widest spread Middle Pleistocene European elephantid. However, the correct identification of *E. antiquus* dentognathic remains (the skeletal parts that show most relevant taxonomical characters) is hampered by the resemblance between molar morphology and the overlap between the morphometric molar parameters of the straight-tusked elephant and those of the steppe mammoth.

The most useful characters of the straight-tusked elephant molars, used here to separate them from those of the steppe mammoth, are: the comparatively higher and narrower (i.e., more hypsodont) lower molars, the presence of the dot-dash-dot incipient wear figure on the occlusal surface (the so-called "antiquoid" pattern), the comparatively more wrinkled enamel, and the presence of acute folds on both the anterior and posterior enamel crests.

A review of fossil elephantid dental specimens housed in the collections of the „Grigore Antipa" Natural History Museum (Bucharest), the Laboratory of Paleontology from the University of Bucharest, and the Teleorman County Museum (Alexandria), corroborated with data gathered from scientific literature, led to the identification of previously unreported material belonging to *E. antiquus*. Although the information gathered so far needs to be completed with possible finds in collections from southern Romania that are still pending revision, the identified occurrences help draw a better picture of the biogeographical distribution of the straight-tusked elephant in the Dacian Basin, by filling blank spots on the *E. antiquus* distribution maps. The Romanian specimens also contribute to the better understanding of the intraspecific variability of *E. antiquus* molars' morphometric parameters, and add information to the ongoing debate on the existence of more subspecies of straight-tusked elephant.

# "What's your beef?" – taxonomical assessement of the large bovid hunted in the upper Palaeolithic from Buda (Bacău County, Romania)

Ştefan VASILE[1], Valentin DUMITRAŞCU[2]

[1]University of Bucharest, Faculty of Geology and Geophysics, Department of Geology, Laboratory of Paleontology, 1 Nicolae Bălcescu Avenue, 010041 Bucharest 1, Romania, e-mail: yokozuna_uz@yahoo.com
[2]Romanian Academy, "Vasile Pârvan" Institute of Archaeology, 11 Henri Coandă St., 010667 Bucharest 1, Romania, e-mail: validumitrascu@yahoo.com

**Key words:** archaeozoology, Bovidae, bison kill site, Palaeolithic.

The upper Palaeolithic site from Buda (Bacău County) has been known for a long time as the large amount of hunted animal bones discovered alongside Gravettian flint tools. However, since most of the material consists in limb bones, the taxonomical assessement of the large bovid hunted at Buda and at the neighbouring site of Lespezi-Lutărie was not fully made, the faunal lists (e.g., Paul-Bolomey, 1961; Bolomey, 1989) usually mentioning the presence of "*Bos*/*Bison*".

The revision of the osteological material from old excavations, as well as the study of newly discovered specimens excavated in the 2012-2014 field campaigns was carried out. The methodology deviced by Olsen (1960) to differentiate between the postcranial skeleton of the cattle and the American bison was successfully employed in order to differentiate between the two large bovids that lived in the middle Pleistocene: the aurochs, *Bos primigenius* (Bojanus, 1827), and the steppe bison, *Bison priscus* Bojanus, 1827. All relevant specimens were found to show characters typical to the Steppe bison, *B. priscus*.

The material is dominated by limb bone epiphyses, suggesting that the upper Palaeolithic site from Buda functioned as a kill site, where the steppe bisons were butchered and the distal limb bones were cracked for marrow extraction.

Gender distribution, estimated from measurements of more complete limb bones, shows that most hunted Steppe bison individuals were females, which suggests bison hunting took place during autumn and early winter, when females where the fattest, preparing for the winter pregnancy, whereas males were weakened after the breeding season.

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# Harpacticoida (Copepoda, Crustacea) of the Western Carpathian spring fens: influence of climate, nutrients and pH on species ecology

Dana HŘÍVOVÁ, Marie ZHAI

Masaryk University, Faculty of Science, Department of Botany and Zoology, Kamenice 5, 625 00 Brno – Bohunice, Czech Republic, e-mails: 323984@mail.muni.cz; marie.zhai@yahoo.com

**Key words:** harpacticoids, content of nutrients, pH, climate, spring fens.

Despite the importance of harpacticoids as a substantial component of spring meiofaunal assemblages, no comprehensive study has been undertaken in the Western Carpathian spring fens up to now. These unique isolated biotopes of high conservation value cover a very long gradient of mineral content of groundwater, due to the variable geological background setting. In this study, we examined harpacticoid assemblages in 50 permanent tree-less spring fens (helocrenes) in the Western Carpathians (Slovakia and Czech Republic) in terms of species composition and total abundance. Altogether, 20 harpacticoid species were identified according to Janetzky et al. (1996) with the total median abundance of 95 individuals (max. 1395 ind.). Five species were newly recorded for Slovakia (*Maraenobiotus brucei* (Richard, 1898), *Elaphoidella gracilis* (Sars, 1863), *Canthocamptus microstaphylinus* (Wolf, 1905), *Bryocamptus rhaeticus* (Schmeil, 1893)) and the Czech Republic (*Pilocamptus pilosus* (Van Douwe, 1910)).

Three significant variables explaining the species data variation selected by using Canonical Correspondence Analysis (CCA) with stepwise forward selection were Ellenberg Indicator Values of plant community for nutrients, in situ measured pH, and average January temperature. The relationships of harpacticoids to these three explanatory variables were species specific and no uniform response of the total assemblage to the environmental variables was found. The only exception was the influence of overall unfavourable conditions in the mineral-poor acidic *Sphagnum*-fens. *P. pilosus* was significantly associated with a higher amount of nutrients and warmer climate. Nutrient enrichment was clearly indicated by a decrease or absence of crenophile *B. cuspidatus*, and accompanied by an increase in ubiquitous *Attheyella crassa*. *Moraria brevipes* was confined to low pH, *B. cuspidatus* showed a high tolerance for low pH, whereas *B. echinatus* preferred alkaline conditions.

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# Quantity methods in invertebrates' biodiversity assessment in Polish caves

Joanna KOCOT-ZALEWSKA[1], Grzegorz KŁYS[1], Bronisław W. WOŁOSZYN[2]

[1] Opole University, Department of Biosystematics, , 45-052 Opole, Oleska 22, Poland; e-mail: asia.zalewska@poczta.fm
[2] Chiropterological Information Center, Institute of Systematic and Evolution of Animals Polish Academy of Sciences , Sławkowska str. No. 17, 31-016 Kraków, Poland,
e-mail: bwwoloszyn@gmail.com

**Key words:** Kraków-Częstochowa Upland, Poland, species' richness, biodiversity

Research on invertebrates' biodiversity of Polish caves is mainly based on a quantity methods - the scope of recognition is systematic adherence of organisms. Effect of which there are lists of species present in caves (Skalski 1973, 1981). One of the frequently shipped elements is the quantity aspect which would allow to place the changes in number and ecological conditions of the particular species of the population. Systematically gathered data enabled some actions to be made to protect organisms inhabiting the caves and the habitats.

Since January 2015, in chosen caves of Kraków-Częstochowa Upland, researches on invertebrate fauna are conducted with the aim to update the knowledge about organisms inhabiting caves in this region as well as the ecological structure. In constant spots, Barber traps are located. Traps don't contain bait (glycol only which conserves caught specimens). Collecting is made constantly, material from traps is collected once a month. In laboratory conditions, the material is labelled and counted, as well as stored with 75% ethyl alcohol. After collecting data from the whole year (12 months), statistical analysis will be performed.

Expected result is preparation of species' list, estimation of main biodiversity, species' richness indicator, dominance, frequency, constancy indicator, as well as fauna indicator. It will enable a comprehensive insight into invertebrates' biodiversity in Polish caves and to spot, among researched caves, those of special natural importance.

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# The impact of microhabitat composition on benthic invertebrate communities structure in streams of Prahova River basin

Darmina DATCU, Mihaela SAVA, Geta RÎŞNOVEANU

University of Bucharest, Faculty of Biology, Department of Systems Ecology and Sustainability, Splaiul Independenţei 91-95, 050095, Bucharest, Romania, email: darminanita@yahoo.com

**Key words:** streams, heterogeneity, microhabitat distribution, benthic macroinvertebrates.

The benthic communities structure reflects the alterations caused by different human activities like stream morphology adjustments. An adequate approach to explore the dynamics of biological components is to cover the entire systems heterogeneity, taking into account that scale is an important intrinsic characteristic of it. Studies at different spatial scales (catchment, reach, mesohabitat, microhabitat) may reveal different interactions and effects. In order to clarify not only the distributional patterns of benthic communities but also the processes that underpin them, microhabitat level approach was granted attention. This study addresses the complex linkages between microhabitat composition and benthic macroinvertebrate structure aiming to provide the scientific knowledge needed to assist monitoring objectives and to inform policy. The AQEM protocol was used to establish the types and share of microhabitats and to sample the benthic macroinvertebrates from 11 sites belonging to 8 streams within Prahova Catchment, Romania. The taxonomic richness and structure of benthic macroinvertebrate communities were assessed in relation to microhabitats types and their share of representation and distributional patterns were revealed. Results concerning how biological components are influenced by microhabitat composition are important not only for elucidating mechanisms that structure disturbed benthic communities but also for ongoing efforts to maintain and improve river health.

# Distribution, abundance and dominance of three species of the genus *Brachinus* (Coleoptera: Carabidae) in seven agricultural crops in Romania, 1977-2012

Mircea VARVARA

Faculty of Biology, University "Alexandru Ioan Cuza" Iaşi, Bd. Carol I nr. 11, 700506 Iasi, Romania, e-mail: mvarvara@uaic.ro

**Key words:** Romania, Carabidae, agricultural crops, ecological requirements.

The present paper is a large synthesis of original data on the occurrence, abundance, dominance and data of autecology of three species of the genus *Brachinus: B. crepitans* Linnaeus, 1758, *B. explodens* Duftschmid, 1812 and *B. psophia* Serville, 1828 in seven agricultural crops during 26 growing seasons 1977-2012 (wheat 22 localities, 1977-2002; maize 18 localities, 1978-2010; potatoes 38 localities, 1978-1999; sugar beet 12 localities, 1977-2001, sunflower 11 localities, 1981-2010, vineyards 4 localities in 1992, apple orchards 6 localities,1979-2000). All localities represented significant agricultural areas of Romania: Dobrudja, Oltenia, Ţara Bârsei, and Moldavia.

The beetles were pitfall-trapped mostly, using 12 traps in each site, protected against precipitations. According to the total number of individuals collected and their dominance within the species, the agroecosystems are arranged in decreasing order as it follows:

1. *B. crepitan*s 945 individuals: wheat - 364 (38.51%), sugar beet - 238 (25.18%), sunflower - 127 (13.43%), apple orchards 122 - (12.91%), maize - 85 (8.99%), vineyards - 9 (0.95%).

The percentage of the presence of *B. crepitan*s in the studied crops was: vineyards 75%, wheat 54.54%, sugar beet 50.0%, apple orchards 50%, sunflower 36.36%, maize 33.33%. No individual of *B. crepitan*s was found in 38 potato crops.

2. *B. psophia*: 431 individuals: wheat - 334 (77.49%), maize 48 - (11.36%), sun flower - 28 (6.49%), sugar beet - 11 (2.55%, potatoes - 7 (1.62%), vineyards - 3 (0.69%).

The percentage of the presence of *B. psophia* in the studied crops was: sun flower crops 45.45%, wheat crops 36.36%, maize crops 27.27%, vineyards 25.00%, sugar beet crops 16.66%, potato crops 7.89%.

3. *B. explodens:* 157 individuals, apple orchards - 117 (74.52%), wheat - 11 (7.0%), sugar beet - 9 (5.73%), sun flower - 9 (5.73%), potatoes - 6 (3.82%), maize - 4 (2.54%), vineyards - 1 (0.63%).

The percentage presence of *B. explodens* in the studied crops was: apple orchards 50%, vineyards 25%, maize 16.66%, wheat crop 18.18%, sugar beet 8.33%, potatoes 5.26%.

The quantitative representation of these species showed a great spatial and temporal variability. The highest recorded dominances of the species *Brachinus crepitans* were: 14.43%, Eudominant (apple orchard, Breazu, 1980) and 12.83%, eudominant (wheat, Leţcani, 1981); *B. explodens* 15.48%, eudominant, (apple

orchards, Breazu, 1980); *B. psophia* 70.89%, eudominant, wheat crop, Lacul Sărat, 1984).

# Home range structure and its impact on survival of Grey Partridge

Martin ČERNÝ[1,2], Miroslav ŠÁLEK[3]

[1] Masaryk University, Faculty of Science, Department of Botany and Zoology, Kotlářská 2, 611 37 Brno, Czech Republic, email: 324055@mail.muni.cz
[2] Moravian museum, Department of Zoology, Zelný trh 6, 659 37 Brno, Czech Republic
[3] Czech University of Life Sciences Prague, Faculty of Environmental Sciences, Department of Ecology, Kamýcká 1176, 165 21 Praha 6, Czech Republic, email: salek@fzp.czu.cz

**Key words:** Grey Partridge, home range, habitat, telemetry, survival, generalized linear model, Cox proportional hazard model, compositional analysis.

The Grey Partridge (*Perdix perdix*) is a widespread but strongly declining species inhabiting rural and agricultural landscapes across Europe. Agricultural intensification which alters many landscape characteristics has been considered a general reason of this decline. In this study, carried out in a landscape with a mosaic of forests and intensively farmed fields in central Europe, we analysed relationships between habitat quality of home ranges and survival of monitored individuals. The understanding of these relationships can propose possible measures to increase the Grey Partridge populations.

In 2009-2010 we monitored 119 radiotagged Grey Partridges around village Milešín in Vysočina district, the Czech Republic. From a total of 4,290 gathered locations, we constructed 167 home ranges (using minimum convex polygons) divided into pre-breeding, breeding and post-breeding periods. From telemetry data and background maps we defined habitat layers to evaluate the effect of landscape on home range size and individual survival using generalized linear models and Cox proportional hazard model. Habitat preferences were determined using the compositional analysis.

Area of home ranges varied depending on habitat representation during the year. The size of spring home ranges significantly increased with the proportion of crops and meadows. Beyond these components, also even rape cultures and gardens played a role in the breeding period. The influence of habitat proportions on adult survival was not significant but landscape structures as the length of habitat peripheries and distance from the village significantly affected predation risk, especially in post-breeding period. During the nesting period, predation risk increased with the distance from the village. However, margins of settlement also reduced survival in the pre-breeding period. During the year, Grey Partridges favored baulks and game refuges while avoiding area of villages and forests. In nesting, partridges avoided the dominant habitats within their home ranges and focused on unmanaged fragments of the landscape.

# Habitat suitability modelling for twelve EU priority bat species within South Eastern Europe

Dragoş Ştefan MĂNTOIU[1,2], Ionuţ C. ŞANDRIC[3], Oana T. MOLDOVAN[2]

[1]EPC Consultanţă de mediu, 7 Haga Str., 011777, Bucharest, Romania e-mail: dragos.mantoiu@epcmediu.ro
[2]„Emil Racoviţă" Institute of Speleology, Cluj Department, 5 Clinicilor Str., 400006; Cluj-Napoca, Romania, e-mail: dragos.mantoiu@gmail.com
[3]University of Bucharest, Faculty of Geography, 1 Nicolae Bălcescu Blvd., 010041, Bucharest, Romania, e-mail: sandricionut@yahoo.com

**Key words:** EU priority bat species, Maxent, species distribution models

This paper used Maxent to predict habitat suitability models for the European priority bat species within South Eastern Europe, which are: *Rhinolophus ferrumequinum* (Schreber, 1774), *R. hipposideros* (Bechstein, 1800), *R. euryale* (Blasius, 1853), *R. blasii* (Peters, 1866), *R. mehelyi* (Matschie, 1901), *Barbastella barbastellus* (Schreber, 1774), *Miniopterus schreibersii* (Kuhl, 1817), *Myotis bechsteinii* (Kuhl, 1817), *M. blythii* (Tomes, 1857), *M. capaccinii* (Bonaparte, 1837), *M. dasycneme* (Boie, 1825), *M. emarginatus* (Geoffroy, 1806) and *M. myotis* (Borkhausen, 1797).

Presence data was collected from the existing literature, taking into account local extinctions. The bioclimatic envelope was used as a base environmental dataset, adding several habitat quality layers which are essential for the survival of some focal species, such as the distance from limestone, settlements and forest quality, represented by an enhanced vegetation index. Niche overlap analysis presented large differences between thermophile (*Rhinolophus*) and northern bat species (*B. barbastellus* and *M. dasycneme*). The data was corrected for spatial biases before it was used for the predictions, yielding models with AUC indexes greater than 0.7.

The results showed high species abundances within the Western Romanian Carpathians, Balkan Mountains, Northern part of Hungary and the Adriatic coast, while low values were recorded in the plain regions. The mountain areas pose high species abundances due to the fact that southern range limits for northern bats intersect northern range limits for thermophile bats. Limestone was a key environmental variable which influenced most of the species distribution, with the least effect to *M. dasycneme*. The minimum temperature of the coldest month had a large contribution to the models, because it can influence the survival rate of a species within the hibernation period.

As species ranges shift due to climate change, habitat suitability models offer a good starting point for various climatic predictions, which may be crucial for the future conservation of endangered species.

# Potential consequences of pesticide use upon local bat population (Order Chiroptera)

Marius-Alexandru CIOCĂNĂU[1], Oana Mirela CHACHULA[2], Dragoş Ştefan MĂNTOIU[3], Georgeta ŞTEFAN[1], Mihai Luchian ALEXE[1], Doina DANEŞ[1]

[1]Faculty of Veterinary Medicine, University of Agronomic Science and Veterinary Medicine Bucharest, 105thIndependentei Street District 5, Romania, marius_ciocanau@yahoo.com
[2]National Museum of Romanian History, 12 CaleaVictoriei Str., 030026, Bucharest, Romania, e-mail: oana_chachula@yahoo.com
[3]„Emil Racoviţă" Institute of Speleology, Cluj Department, 5 Clinicilor Str., 400006; Cluj-Napoca, Romania, e-mail: dragos.mantoiu@gmail.com

**Key words:** bats, Chiroptera, pesticides, toxicology

In June 2015, there were reports of high mortality rates among the bats (Order Chiroptera), that were roosting in a cave in Isverna, Romania. The cave in which the colony habited is closed to the general public. In the same period, beekeepers experienced higher than normal mortality rates or colonies too weak to be productive. No other sudden exitus events among bats were reported prior to this episode. The dead individuals were found in a specific pattern that suggest an acute exitus.

We were able to determine the species using craniometrical analysis for 9 samples. The early work of Călinescu R., during the 1930s confirms the colony presence in this habitat. Coauthors' personal observations confirm that *Myotis myotis/ Myotis blythii* are present to this day. Approximately 30 individuals in the hibernation period (1.03.2004 - 6.12.2009) and 500 individuals in the gestation period (20.06.2006 - 1.05.2011) were noticed.

Samples were collected and examined using plain X-ray, bacteriological, and toxicological tests. It was noted that no bone lesions were present, thus excluding high impact traumatic lesions. The topography of the samples shows a high density of individuals that might be related to the fast exitus and the impact with the rugged terrain of the cave. Infectious agents were also investigated, results revealing only non pathogenic bacteria. Several viral agents were tested using classic-PCR, including rabies virus, but results were also negative, thus excluding an infectious disease as primary cause of death. The toxicology results were inconclusive but those results do not rule out the possibility of an acute intoxication. The obvious connection between the simultaneous high mortality of bats and bees may be linked to pesticide exposure. In terms of biodiversity, a question raises: what are the long-term effects and overall impacts of pesticide use upon local bat populations?

# Light pollution and nocturnal mammals. Case study: influence of artificial light on bats

Bronisław W. WOŁOSZYN

Chiropterological Information Center, Institute of Systematics and Evolution of Animals, Polish Academy of Sciences, Sławkowska 17, 31-016 Krakow, Poland; e-mail: bwwoloszyn@gmail.com

**Key words:** Light pollution, insectivorous bats, Rhinolophid bats, illumination of bat roosts

Light is a complex environmental factor. The amount of radian energy, intensity wavelength, and also the resulting colour of light – all these factors affect the organisms, both plants and animals.

Circadian rhythmicity in plant and animal physiology resulting from the day-night rhythm of light is well known since a long time. This phenomenon is called "photoperiodism".

The Earth rotation causes the daily change of lighting (day and night), while the change in the inclination of the Earth axis relative to the Sun is the cause of the annual cycle of seasonal climate changes. The Moon orbiting around the Earth also illuminates its surface, being an additional factor influencing the activity of living organisms. Both plant and animals have evolved their biological rhythms as an adaptation to these environmental changes. This allowed them to synchronize their activity with the environment, ensuring that their functional capacity is efficient, useful and safe.

Diurnally active plants and animals, and humans as well, suffer from the scarcity of darkness at night, because the lack of darkness caused by artificial lighting disrupts their rhythm of activity. Similarly dependent on the darkness, nocturnal animals are affected because the intense light at night disrupt their ability to acquire food, hinders migration and reproduction, exposes them to danger of loss of life.

There is however, a certain ambivalence in the impact of artificial lighting on the nocturnal animal activity. The nocturnal insects orient themselves in flight maintaining a constant angle to light sources, which are, in an antropogenically undisturbed environment, the Moon or stars. The local artificial lights change the rectilinear flight route into the helical one, directing the insects to the light source that generally ends their life. Streets lights, luring the insects, cause of insectivorous bats, the ones inhabiting of temperate zone of Holarctic, to use the lamplight as a place of effective hunting for insects. On the other hand, the lighting of bats roosts remarkably disturbs their rhythm of activity. During summer time, bats frequently use different buildings like churches as a place to form their maternity colonies. Frequently, external illumination of churches does it inutile as a refuge for same bat species, especially for Rhinolophid bats.

The examples presented above support the ambivalence of the artificial light which not always has a negative effect on the activity of nocturnal animals.

# Ecological peculiarities of small mammal communities from "Plaiul Fagului" Reserve, Republic of Moldova

Victoria NISTREANU[1], Alina LARION[1], Vlad POSTOLACHI[1], Victoria BURLACU[2], Natalia CARAMAN[1]

[1]Institute of Zoology of Academy of Sciences of Moldova, 1 Academiei Str., Chisinau, MD-2028 vicnistreanu@gmail.com
[2]National Centre of Public Health,67A Gh. Asachi Str., Chisinau, 2028-MD, Republic of Moldova

**Key words:** Reserve, small mammals, communities, biotopes, dynamics, diversity, similarity.

The studies were performed in Plaiul Fagului reserve from the central part of the Republic of Moldova during 2011-2014. During the study, 26 species of small mammals (7 insectivore and 19 rodent species) were registered in the reserve. Among them, several rare and endangered species were recorded, such as *Sorex minutus, Crocidura leucodon* among insectivores and *Myoxus glis, Micromys minutus, Pitymys subterraneus* among rodents. In all years, *Apodemus agrarius* was the dominant species with more than 33% of all small mammals, while among shrews *Sorex araneus* was the most abundant. The highest diversity in wet habitats and a general increasing of diversity indexes (Shannon, Simpson) in most of biotopes, from the beginning of study period to the last year, were observed. The species richness, evaluated according to Margalef index, increased for the same period, the maximum values being registered on the account of rarer shrew species. The Berger-Parker index reports the proportional abundance of only the most abundant species in the population. Thus, it was the highest in the biotopes where 2-3 species dominated and constitute more than 70% of the community. The values of Shannon diversity index in spring period were comprised between 0.3 and 0.85 and in autumn between 0.6 and 1.1, the lowest being registered in forest ecosystems and the highest in wet biotopes. The highest similarity was registered between cultivated land situated near the forest and edge of acacia plantation, as well as between shores of water basins and wet valleys. The rarefaction analysis indicates that a fraction of species diversity was not yet discovered. The monitoring of small mammal fauna will continue.

# Diversity, abundance, and occupancy of longicorn beetles (Coleoptera: Cerambycidae) in traditionally-managed Romanian forests

Bekka S. BRODIE[1], Viorel D. POPESCU[2], Laurențiu ROZYLOWICZ[2], Melissa FIERKE[1]

[1]SUNY Environmental Science and Forestry, Department of Environmental and forest biology, 1 Forestry Drive, Syracuse, 13210, New York, USA, e-mail: bekkasbrodie@gmail.com
[2]University of Bucharest, Centre for Environmental Research, 1 N. Balcescu, Sectar 1, 041346, Bucharest, Romania

**Key words:** longicorn beetles, Cerambycidae, conservation, Iron Gates Natural Park, diversity, monitoring, pheromone

Longicorn beetles (family Cerambycidae) provide ecosystem services, are biological indicators of forest health, and can be used as conservation surrogates for other forest species of conservation concern. Therefore, developing effective and time efficient monitoring methods to survey and collect quantitative information is crucial for informing viable conservation strategies for saproxylic beetles. Using pheromone lures in combination with flight intercept traps we monitored data deficient, vulnerable and endangered longicorn beetles in two forested landscapes within the Iron Gates Natural Park, Romania. Using 12 repeated surveys between 18 May and 14 June 2015, our study was targeted at (1) identifying saproxylic beetle community composition, (2) determining differences in species diversity between managed forests and traditionally maintained landscapes, (3) evaluating beetle abundance and habitat occupancy using microhabitat and climate information, and (4) providing information on best forest management practices for conserving these beetles. We captured a total of 40 species, of which 10 were rare (<10 captures); 5 species amounted to 80% (n=2561) of all beetle captures. The two landscapes differed in their community composition, and the managed forest had a higher proportion of rare species. Our study is the first cost-effective and rapid assessment for monitoring the status and taxonomic diversity of longicorn beetles in Romania. The habitat associations identified for both common and rare species can be directly used in forest management and beetle conservation decisions.

# Monitoring of species and community interest habitats from Romania for assessing the conservation status

Simona MIHĂILESCU, Ion CRISTEA, Viorica HONCIUC, Daniela STRAT

Institute of Biology Bucharest, Romanian Academy, 296 Splaiul Independentei, 060031, Bucharest, Romania, e-mail: biodiversitateibb@gmail.com

**Key words:** monitoring, national report, Natura 2000, species and habitats of Community interest.

The project „Monitoring the conservation status of species and habitats in Romania under Article 17 of the Habitats Directive" has been developed between 2011-2015 and it is the first national project related to the reporting obligations of Romania under the Habitats Directives (HD).

The monitoring of conservation status is an obligation for all habitats and species of community interest, which are present on its national territory. Therefore, data need to be collected both in and outside Natura 2000 network to achieve a full appreciation of conservation status. The main results of this monitoring have to be reported to the Commission every six years according to Article 17 of the HD.

Since 2007, in Romania, protected areas have been designated as part of the European Natura 2000 Network including the characterization and distribution in Romania of the species and habitats of the community interest.

One of the aims of the project was to create an unified framework for monitoring the conservation status of species and habitats of community interest and its implementation at national level for reporting in 2013, to the European Commission, by the competent authority in Romania. This report is accessible via the Internet (www.simshab.ro) to all those involved and interested in the first reporting obligations to the European Commission.

Taking into consideration the official Romanian Report, 26.65% of species and habitats are in a Favorable Conservation Status. The main purpose of analyses is to provide the appropriate basic management tools and required infrastructure, guaranteeing efficient and effective management of habitats included in Natura 2000 network. There are still significant gaps in knowledge for some species and habitats distribution. However a scientific database that stores information collected by biologists during the project has been created to allow an open access to any citizen.

# Genetic characterisation of *Huso huso* Linnaeus, 1758 aquaculture individuals using microsatellite markers

Alexandru BURCEA[1], Gina-Oana POPA[1],
Iulia Elena FLORESCU[1], Lucica TOFAN[2], Andreea DUDU[1],
Sergiu Emil GEORGESCU[1], Marieta COSTACHE[1]

[1]University of Bucharest, Faculty of Biology, Department of Biochemistry and Molecular Biology, Splaiul Independenței 91-95, 050095, Bucharest, Romania, e-mail: alexanburcea@gmail.com, marietacostache@yahoo.com
[2]"Ovidius" University of Constanța, Faculty of Natural and Agricultural Sciences, Department of Biology-Ecology-Geography, Aleea Universității 1, 900470, Constanța, Romania, e-mail: lucicatofan@gmail.com

**Key words:** beluga, genetic diversity, Lower Danube, aquaculture, microsatellite markers.

The beluga or *Huso huso* Linnaeus, 1758 is a migratory sturgeon found natively in the Lower Danube. Its historical distribution included areas in the Upper and Middle Danube but because of the Iron Gates Dams I and II the migration of the beluga was limited to the Lower Danube. It is considered a critically endangered species by the IUCN Red List because of anthropic actions such as habitat damming and embankment, overfishing, poaching and pollution. For restocking efforts, it is important to genetically characterise sturgeon aquaculture strains.

In this study we analysed two aquaculture strains with a total of 29 individuals from South East Romanian fish farms. We used the following six microsatellite markers: AnacC11, AoxD161, AoxD234, LS19, LS34, and LS54 that were cross-amplified in several standard PCR reactions. The fragment electrophoresis was performed on ABI PRISM 310 Genetic Analyser (Applied Biosystems) and data analysis was done with GENETIX and FSTAT software.

For the first aquaculture strain we have observed that the expected heterozygosity (He=0.3294) was lower than the observed heterozygosity (Ho=0.4250) which together with a negative (-0.267) FIS value shows good genetic diversity for this strain. For the second strain the He (0.5360) was higher than Ho (0.4815) and the FIS value is that of 0.160 meaning that this aquaculture strain has poor genetic diversity and a slight level of inbreeding.

In conclusion, we can say that the first aquaculture strain is suitable for future restocking efforts and that the second strain should not be used because of the risk of damaging the genetic diversity of future sturgeon stock.

# Natural and artificial fragmentation in *Bombina variegata* (Amphibia: Anura: Bombinatoridae) populations in and around Cozia National Park

Alexandru IFTIME[1], Oana IFTIME[2]

[1]"Grigore Antipa" National Museum of Natural History, Şos. Kiseleff no. 1, 011341 Bucharest 2, Romania, e-mail: aiftime@antipa.ro
[2]Department of Genetics, Faculty of Biology - University of Bucharest, Aleea Portocalelor 1-3 060101 sector 6, Bucharest, Romania, e-mail: oiftime@gmail.com

**Key words:** *Bombina variegata*, population, gene flow, migration, barrier, fragmentation.

*Bombina variegata* is a protected species still locally common in Romania, but which has also undergone declines in parts of its range (see, e.g. Cogălniceanu et al., 2000). For species of reduced mobility, such as amphibians and reptiles, artificial habitat fragmentation and subsequent reducing of gene flow can and does lead to inbreeding depression and to a greater risk of extinction in the smaller, more isolated populations (see, e.g., Allentoft & O'Brien, 2010).

We have explored the distribution of *Bombina variegata* in Cozia National Park and its vicinity, an area of great landscape fragmentation with both natural (e.g. high, rocky, arid ridges) and artificial (roads, dammed rivers, dense settlements) barriers for amphibian migration and gene flow, taking into consideration the previously identified (Iftime & Iftime, 2007) signs of former introgressive hybridization of *Bombina variegata* with *Bombina bombina,* the latter now absent in the area, likely because of habitat destruction. We identified a number of discrete populations of *Bombina variegata*, some of which appearing isolated at the present time, and some probably still communicating with each other and with larger populations outside the study area. We discuss the role of natural and artificial barriers and set the context for further exploration of the connectivity and/or its lack thereof between *Bombina variegata* populations in Cozia.

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# A new method of identifying recaptured individuals of small lizards: a case study on the skink *Ablepharus kitaibelii* ssp. *stepaneki*

Alexandra TELEA, Dragoş BĂLĂŞOIU, Marian TUDOR

"Ovidius" University of Constanţa, Faculty of Natural and Agricultural Sciences, Department of Natural Sciences, Aleea Universităţii nr. 1, corpul B, Constanţa 900470, Romania, e-mail: alexandra.telea@gmail.com

**Key words:** lizard, skink, photo-identification, survey method, dorsal pattern.

*Ablepharus kitaibelii* is the smallest lizard in Europe: it can reach a maximum of 130mm in length and can weigh about 1.2 grams, tail included. In a recent mark-recapture study of a population of *Ablepharus kitaibelii ssp. stepaneki* from Dobruja, Romania, we have applied a new method of identifying recaptured individuals.

Capture-mark-recapture methods are mostly used in species demographic studies. Marking methods include morphological modifications such as toe clipping, scale scaring, paint marking, external or subcutaneous tagging, and the use of patterns or specific marks of individuals.

For small lizards, such as *Ablepharus kitaibelii*, tags are still too big, paint marking is not viable for a long-term study and the commonly used method of marking this species, toe-clipping, is viewed by some (including us) as being unethical.

All these considered, as well as the fact that the population we studied already displayed marks indicating high predation activity (missing body parts, regenerating tails, wounds etc.), we tried to use a method as little stressful as possible: photo-identification using automatic digital image matching.

The undertaken study implies we photograph the individuals. After we processed and chose the best picture, we used the $I^3S$ program to create a fingerprint for each individual. The reference area chosen is the dorsal pattern between the posterior members because this area is naturally kept in a straight line. The program automatically compares each fingerprint to the database and returns a list of matches. Afterwards, we checked the results and manually chose the best match.

The method was successful, yielding mostly correct matches, the only problems being false positives in less than 20% of the results. 34 individuals were initially studied, the method being currently still improved so that we can assess all the variables that can influence the results of photo-identifying *Ablepharus kitaibelii* using the dorsal pattern.

# Contributions to the study on Black Stork population ecology within Dumbrăviţa Fishing Complex

Mihaela CIOBOTĂ[1], Andreea CIOBOTĂ[2], Cristina Andrea STAICU[3]

[1]University of Bucharest, Master of Taxonomy and Biodiversity, 91-95 Splaiul Independenţei, 050095 Bucharest 5, Romania, e-mail: Strix_nebulosa1@yahoo.com
[2]Romanian Society of Ornithology, 3 Hristo Botev Blvd., ap.6, 030231 Bucharest 3, Romania
[3]University of Bucharest, Department of Biochemestry and Molecular Biology, 91-95 Splaiul Independenţei, 050095 Bucharest 5, Romania

**Key words:** *Ciconia nigra*, stopover point, feeding behaviour, fishing complex management

Defined by unique features within the *Ciconia* genus (extensive breeding area, criptic behaviour, specific habitats), the Black Stork epitomizes the "umbrella species" concept. With mostly unknown population trends across Europe, it is listed as SPEC2, while Romania classified *Ciconia nigra* as Vulnerable Species, due to its population decline. As unfavorable trends for long-distance migrants, such as the Black Stork, they are more and more studied from the migrational costs point of view. The presence of proper feeding habitats on migration routes becomes vital. This study asseses the importance of an anthropic habitat, Dumbrăviţa Fishing Complex (Braşov, Romania) as a stopover point for the Black Stork's fall passage, focusing on the species' feeding habits to design future conservation measures.

Throughout the fall passage of 2015 (August-September), Black Storks were observed weekely during their evening feeding period (4-6 P.M.), through binocular monitoring. Impressive numbers were recorded at the end of August (67 individuals). In comparison to the Black Stork's fall passage of 1995 (Ionescu, 2002) it has revealed a significant increase in numbers and a peak-month transition, from August to September. Changes in population size during this period could have been geared by resources, water level management (development of new ponds, *Carassius gibelio* – main aquacultured species, periodical water level decreases) or climatic conditions. Out of those factors, water level impacts mostly on the number of species and distribution within the area. Regarding feeding habits, flocks were observed covering a direction- mentained linear path and, when feeding in deeper waters occurs, this behaviour potentially is attributed to water currents. Feeding places were shared with Ardeidae species (*Ardea alba*, *Egretta garzetta*), while antagonistic behaviour was displayed exclusively towards *Ardea cinerea*, during food competitions.

Thus Dumbrăviţa Fishing Complex represents a major stopover point for the Black Stork's fall passage through resources, water level management and limited anthropic impact. This study offers insight into management of artificial habitats, and their importance on avian migration routes.

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# Assessing biological realism of wildlife population estimates in data-poor systems

Viorel D. POPESCU[1], Ioan-Mihai POP[1], Steluța MANOLACHE[1], Kyle ARTELLE[2], Laurențiu ROZYLOWICZ[1]

[1] Centre for Environmental Research (CCMESI), University of Bucharest, 1 N. Balcescu Blvd., sector 1, Bucharest, Romania; vioreldpopescu@gmail.com
[2] Earth to Ocean Research Group, Biological Sciences, Simon Fraser University, 8888 University Drive, Burnaby BC, V5A 1S6, Canada

**Key words:** brown bear, wolf, Eurasian lynx, abundance estimates, population growth, trophy hunting.

Regulated hunting is a common management tool in many jurisdictions, yet relevant decisions are commonly taken in the absence of reliable population data. We used European large carnivores (*Ursus arctos*, *Canis lupus*, and *Lynx lynx*) management to evaluate the biological plausibility of population estimates used in hunting decisions in data-poor systems. We used Romania as a test case as this region is not only data poor, but the public and private game managers are beneficiaries of revenue from hunting activities. We asked how population growth rates calculated from reported abundances between 2005 and 2012 are compared to published growth rates empirically derived from other European populations. We evaluated whether the reported estimates fell within the bounds of biologically plausible trajectories using simulations. For *U. arctos*, a species generating high revenue, annual population growth rates derived from reported estimates were frequently greater than the maximum published growth rates (up to 1.5, compared to $\lambda_{max} = 1.102$). Reported estimates were greater than maximum simulated populations in 45% of cases, and the difference was positively correlated with hunting pressure ($r_s = 0.659$). Population growth rates for *C. lupus* overshot $\lambda_{max}$ (1.29) less frequently, reported estimates were largely within the bounds of biologically plausible estimates (91%), and there was a weak correlation between hunting pressure and differences between reported estimates and maximum simulated populations ($r_s = 0.241$). *L. lynx* population growth rates derived from reported estimates were lower than minimum simulated populations (60%), and there was a weak correlation between hunting pressure and biologically unrealistic estimates ($r_s = 0.319$). Our study suggests that comparing population estimates used by management agencies to demographic data obtained through rigorous peer-reviewed studies is a useful approach for evaluating the biological plausibility of wildlife data in data-poor systems, especially in systems where management decisions might be influenced by non-scientific incentives.

# Distribution, habitat use and threats of Eurasian otter (*Lutra lutra*) in Putna Vrancea Natural Park (South-eastern Carpathians, Romania)

George BOUROȘ[1,2]

[1]Doctoral School of Biology, Faculty of Biology, University of Bucharest, Splaiul Independenței 91–95, 050095, Bucharest, sector 5, Romania, e-mail: bourosg@yahoo.com
[2]Association for the Biological Diversity Conservation, Focșani, Ion Creangă 12, 620095, Vrancea County, Romania, e-mail: bouros.george@acdb.ro

**Key words:** Eurasian otter, Romania, distribution, habitat use, status, threats.

The present study aimed to find out the distribution, habitat utilization and population status of Eurasian otter in Putna Vrancea Natural Park.

The distribution, habitat use and threats of the otter (*Lutra lutra*) in Putna Vrancea Natural Park, were assessed by applying two methods: spot check and standard otter survey, within the period December 2012 and August 2015.

Otter signs of presence (tracks, spraints, anal secretions, holts) and environmental conditions (river depth, river width, human disturbance, vegetation cover) were recorded in 41 sites using standard otter survey methods and we also registered data about otter signs and vegetation cover, using spot check method in 151 sites in the preliminary otter survey.

The distribution survey results revealed that the otters are widespread and breeding within Putna Vrancea Natural Park rivers and streams, but the species' presence is being very scarce in small streams or absent at altitudes over 1000 m.

Using GIS methods, all the data obtained from surveys were plotted in maps of distribution and in otter density maps, for a better comparison, analysis and data visualization.

Another output of the research is the fact that otters prefer the habitats with dense vegetation cover on the banks of the widest rivers and medium freshwater streams, while the small streams were avoided during our study.

In Putna Vrancea Natural Park, important anthropogenic changes are still undergoing affecting distribution and behavior of otters. The main conservation threats identified were: forest exploitation, increase of built space, high human presence and disturbance, habitat loss and conflicts with fish farms and angling.

Distribution, habitat use, and factors affecting the otter population in Putna Vrancea Natural Park are key elements which must be known in order to establish conservation measures and a good management of this species.

# Non-invasive monitoring of the European wildcat (*Felis silvestris silvestris*) in the Biogenetic Casentinesi Reserves: a six year-long study experience

Marco LUCCHESI[1], Edoardo VELLI[2], Roberto SANTONI[3], Giovanni QUILGHINI[4]

[1] Biodiversity Office, Forestry Administration, Via D. Alighieri 41, 52015 Pratovecchio (Arezzo), Italy
[2] Department of Science, Università degli studi Roma Tre, Viale Guglielmo Marconi 446, 00146 Rome, Italy.
[3]Via Cherubini 42, 50019 Sesto Fiorentino (Firenze), Italy
[4]Biodiversity Office, Forestry Administration, Via D. Alighieri 41, 52015 Pratovecchio (Arezzo), Italy

**Key words:** *Felis silvestris*, monitoring, camera trapping, valerian lures, population, conservation biology.

The European wildcat (*Felis silvestris silvestris*) is one of the most elusive carnivores in the Italian peninsula. It is mainly threatened by habitat fragmentation and especially hybridization with the domestic cat. Effective actions for its conservation are strictly related to a sound knowledge of its population parameters and genetic status. In this study we present a six year-long monitoring that provided a complete informative framework on the wildcat in the Biogenetic Casentinesi Reserves inside the Foreste Casentinesi National Park, the northernmost border of its ascertained peninsular range. We applied an extensive camera-trapping protocol based on a systematic grid in order to approach the same capture probability for all the individuals in the study area. Furthermore, in the last two years, we used valerian-baited hair-traps to verify the actual reliability of this technique in attracting wildcat individuals and leading them to rub against the hair-traps in order to catch biological samples for future genetic analyses. We collected a total of 269 wildcat pictures identifying a minimum number of 13 individuals (capture density 0,68/10 km$^2$) and detecting the presence of at least one domestic cat and a putative hybrid in the study area. The use of lures proved to be effective in increasing the capture probability of the target species in camera-trapping based studies ($p<0,05$).

However, only some individuals showed a clear rubbing behavior and left hair in the hair-traps, supporting the hypothesis of a different individual genetically-mediated reaction. This work represents the first exhaustive long-term study on the conservation status of European wildcat population in the northern Apennine, giving essential information for its conservation.

# Mitochondrial DNA-based phylogeography of the European wildcat (*Felis silvestris silvestris*) in Europe: extant structure and historical inferences on species' biogeography

Edoardo VELLI[1], Marco A. BOLOGNA[1],
Federica MATTUCCI[2], Ettore RANDI[2]

[1] Department of Science, Università degli studi Roma Tre, Viale Guglielmo Marconi 446, 00146 Rome, Italy. E-mail: edoardo.velli@uniroma3.it
[2] Genetic Laboratory, Istituto Superiore per la Protezione e la Ricerca Ambientale (ISPRA), Via Ca' Fornacetta, 9, 40064 Ozzano dell'Emilia, BO, Italy

**Key words:** *Felis silvestris*, phylogenetics, phylogeography, biogeography, introgression, wildcat.

The European wildcat (*Felis silvestris silvestris*) is characterized by fragmented and genetically differentiated populations. However, the phylogenetic relationships and the biogeographic history of the species is still unclear. Furthermore, the long sympatry with the domestic cat that has characterized the last 10 000 years makes particularly interesting the understanding of possible past introgression events. In this work we sequenced a portion of NADH-5 gene of mitochondrial DNA that contains polymorphisms able to distinguish wild from domestic subspecies and to provide good phylogeographic information. We performed a phylogenetic and phylogeographic analysis on a sample of 717 individuals (212 domestic cats, 433 wildcats and 72 putative hybrids from Scotland and Hungary) collected across Europe and previously typed at 31 microsatellite loci and assigned to their subspecies by means of Bayesian clustering. The results showed two main differentiated clades whose haplotypes featured respectively the wild and domestic polymorphisms. All domestic cat samples showed the expected domestic haplotypes. Moreover, we also found that 40.1% of wildcats shared some domestic haplotypes along with 60 putative hybrids (83.3%). The 74.7% of wildcats featuring domestic haplotypes were grouped in a separate clade that diverged from the rest of group about 37,700 years ago and that was present across all Europe. The clade featuring wildcat polymorphisms showed a clear geographic structure. A first Mediterranean/continental main differentiation began about 64,200 years ago followed by a separation among central Europe/Iberian peninsula, Italy and Scotland regions with typical post-glacial recolonization patterns and a degree of haplotype sharing. This work provided a comprehensive phylogenetic and phylogeographic analysis of European wildcat and tried also to clarify the origin of domestic-wild shared haplotypes advancing new and complementary hypothesis about the biogeographic history of the species and enhancing the use of these markers in wildcat conservation studies.

# An assessment of Brown bear and human interactions in Romania: 2002-2015

Lucian Marius PĂTRAŞCU[1], Silviu CHIRIAC[2],
Ioan-Mihai POP[1], Radu Mihai SANDU[2], Jozsef BOTH[3]

[1]Association for Biological Diversity Conservation, Ion Creangă nr.12, 620083 Focsani, Vrancea County, Romania, e-mails: patrasculucianmarius@yahoo.com; minelpop@yahoo.com
[2]Vrancea Environmental Protection Agency, B-dul. Dinicu Golescu nr.2, 620160 Focsani, Romania, e-mail: silviu_chiriac@yahoo.com; radumihai_sandu@yahoo.com
[3]Harghita Environmental Protection Agency, Str. Márton Áron no. 43, 53021 Miercurea Ciuc, Romania, e-mail: bothjozsef@yahoo.com

**Key words:** brown bear, attacks, human deaths, injuries.

Official estimation of the Brown bear population from Romania states that about 6,000 individuals reside in a 69,000 sq km area. 93% of the population is located in mountain regions and the rest of 7% in hilly areas.

Overlapping of habitats used by bears with areas exploited by humans leeds often to conflicts and interactions which end with injuries or even human deaths.

The assessment is based on information regarding bear attacks on humans collected between 2002 and 2015 in the framework of some large carnivore conservation projects. All gathered data originated from observations made by our field teams, questioning of attack victims, using questionnaires and mass media news articles.

In our analysis we examined 120 bear-human interactions that ended with 136 people injured and 11 deaths. Spatial analysis of the locations where the bear attacks occurred revealed that most frequent interactions took in the surrounding areas of rural settlements from subcarpathic regions. Temporal data indicated that attacks took place most often in late summer-early autumn, between August and October.

When we examined the occupational profile of the attack victims we observed a high predominance of cases in which people have jobs directly related to the use of natural resources (shepherds, mushroom or fruits gatherers, hunters).

# WOLFLIFE project. Survey design and preliminary results for the estimation of wolf population size and packs' distribution in the Eastern Carpathians, Romania

Andrea GAZZOLA[1], Teodora SIN[1,2], Ioan-Mihai POP[1], György Lajos BERDE[3], Szilárd SZABÓ[4], Andrea CORRADINI[1,5], Silviu CHIRIAC[6]

[1]Association for the Conservation of Biological Diversity, Ion Creangă 12, 620083, Focşani, Vrancea, Romania,
e-mails: andrea.gazzola@acdb.ro; teodora.sin@acdb.ro; mihai.pop@acdb.ro; corradini.andre@gmail.com
[2]University of Bucharest, Department of Systems Ecology and Sustainability, Splaiul Independenţei 91-95, 050095, Bucharest 5, Romania
[3]Environmental Protection Agency Covasna, General Grigore Bălan 10, 520013 Sfântu Gheorghe, Covasna, Romania, e-mail: berdelala@yahoo.com
[4]Environmental Protection Agency Harghita, Márton Áron 43, 530211 Miercurea Ciuc, Harghita, Romania, e-mail: szabo_szilard@yahoo.com
[5]University of Florence, Agricultural School, Piazzale delle Cascine 18, 50144, Florence, Italy
[6]Environmental Protection Agency Vrancea, Dinicu Golescu 2, 620106, Focşani, Vrancea, Romania, e-mail: silviu_chiriac@yahoo.com

**Key words:** wolf, large carnivores, conservation, survey design, LIFE project

Currently, because of the rapid environmental changes, one of the biggest challenges in Nature Conservation is to decrease the loss of biodiversity and to prevent the extinction of species whose dynamic is strongly influenced by human activities.

Conservation objectives can be difficult to reach if the management measures are not supported by robust knowledge on ecosystems' functioning. In Europe, LIFE+ Nature and Biodiversity programme is one of the main financial instruments supporting innovative or demonstration projects that tackle wider biodiversity issues. Since 1992, LIFE has co-financed numerous projects targeting the protection of the environment, climate and threatened species.

Large carnivores play an important role in ensuring the right functioning of ecosystems and are fundamental for the conservation of biodiversity and resiliency of ecosystems. Due to their habitat requirements, they are among the species mostly affected by habitat loss and fragmentation, entering often in conflict with human populations. Wolf (*Canis lupus*) is probably one of the most representative example. Its important role in the ecosystem has been widely recognized, but its elusive behaviour, the characteristic usage of large territories, the variety of habitat types and the wide spectrum of food sources hampers the efforts to obtain reliable information on the ecology of the species.

The Romanian wolf population is one of the largest in Europe and wolves have historically been well widespread in the Romanian ecosystems. Nevertheless, wolf ecology has been poorly studied and, consequently, basic information on population size, pack size and distribution, wolf diet and wolf-prey interaction, depredation level on livestock are still deficient.

Since July 2014, WolfLife project - LIFE13 NAT/RO/000205 is being implemented in the Eastern Romanian Carpathians. In the present study, we are

going to describe the implemented survey designs and to display preliminary results collected during the first year monitoring activity.

# An analysis of dolphin stranding on the Romanian Black Sea coast

Răzvan POPESCU-MIRCENI[1], Răzvan ZAHARIA[1],
Marius PALADE[1], Nicoleta MARIN[1,2]

[1]Oceanographic Research and Marine Environment Protection Society Oceanic-Club, 41 Decebal Street, 900674, Constanța, Constanța County, Romania, email: club@oceanic.ro
[2]Sanitary-Veterinary and Food Quality Control Division, 78 Mangaliei Avenue, 900111, Constanța, Romania

**Key words:** dolphin, cetacean, stranding, cause of death, statistic.

Between June 2007 and June 2012, the authors investigated all of the dolphin carcasses washed up on the Romanian shore; a total of 407 carcasses belonging to all three species living in the Black Sea: *Phocoena phocoena*, *Tursiops truncatus* and *Delphinus delphis*. The research was part of the "Delfinii în criză! Dolphins in distress!" program, implemented by the Oceanographic Research and Marine Environment Protection Society "OceanicClub" financed from its own budget.

A network for collecting information was created in order to retrieve the locations of stranded cetacean carcasses. The elements of this network were represented by field volunteer teams, partnerships with Romanian authorities, field expeditions after periods of favorable strong winds.

For every carcass we recorded the GPS position, biometric measurements, decomposition stage and estimated age (considering total length and development stage of the reproductive apparatus). For every carcass, a necropsy was conducted in order to identify the cause of death, health status of the individual before death and to confirm or correct the estimated age (analyzing reproductive apparatus and bone tissue). All data was linked to weather parameters and human activity data (e.g. fishing, hydrotechnical works, military exercises etc.). Necropsy analyses were conducted in the special designated laboratory of the SanitaryVeterinary and Food Quality Control Division from Constanța.

Among the 407 investigated carcasses we identified the cause of death for 378 as follows: 281 *Phocoena phocoena* (221 - fishing nets by-catch and ghost fishing, 26 - juvenile starvation, 14 - boat collisions, 9 - parasites, 8 - septicemia, 3 - biological age), 63 *Tursiops truncatus* (42 - fishing nets by-catch and ghost fishing, 11 - infectious disease, 5 - microlesions inside the melon, 3 - birth problems, 2 - biological age), 34 *Delphinus delphis* (12 - infectious disease, 7 - internal lesions, 6 - boat collisions, 6 - microlesions inside the melon, 3 - biological age).

# The Ant Collection (Hymenoptera: Formicidae) of the Natural History Museum of Sibiu (Romania)

Ioan TĂUȘAN, Ioana Cristina NEGRILĂ

"Lucian Blaga" University of Sibiu, 5-7 Dr. Ion Rațiu Str., 50012, Sibiu Romania, e-mails: itausan@gmail.com, nc.ioana@yahoo.com.

**Key words:** Formicinae, Myrmicinae, Dolichoderinae, Ponerinae, museum heritage, Transylvania.

The Natural History Museum of Sibiu was founded on the 12th of May 1894 by the Transylvanian Society for Natural Sciences from Sibiu (*Siebenbürgische Verein für Naturwissenschaften zu Hermannstadt*). The collections were initiated in 1849 long before the museum was open to the public, and the Society had regular scientific meetings since 1845. The foundation members were: Michael Bielz (1787–1866), Ludwig Neugeboren (1806–1887), Michael Fuss (1816–1883) and Karl Fuss (1817–1874).

The ant material preserved in the Natural History Museum of Sibiu is considered one of the most important collections in Romania. The ant collection consists of three collections: the former Transylvanian Society for Natural Sciences from Sibiu containing among other specimens, Paul Röszler's types, Dr. Eugen Worrell's and Dr. Eckbert Schneider's personal collections.

Despite consisting of 1907 specimens its value is given by its age (it was founded 1853), and as well by its content. Herein, we highlight an overview of the ant species preserved in the Natural History Museum of Sibiu. The collection includes 86 ant species. The material was collected mainly from Romania, especially from Transylvania, but there are specimens collected from other European countries.

# The value of paleontological collections of the "P. A. Lazarev" Museum of Mammoth for the knowledge of the biosphere evolution in the Quaternary

Konstantin PROTODYAKONOV, Semyon GRIGORIEV, Maksim CHEPRASOV, Sergey FEDOROV, Gavril NOVGORODOV

"P. A. Lazarev" Museum of Mammoth, Institute of applied ecology of North, North-Eastern Federal University, Yakutsk, Russia, e - mails: www.istorik.ru@mail.ru, g_semen@mail.ru, nohsho@mail.ru, sergej.fedorov@mail.ru, novgorodovgavril@mail.ru

**Keywords: museum,** paleontological collections, evolution, Mammoth fauna, Quaternary.

Permafrost that covers the whole territory of Yakutia, preserved to this day skeletons, corpses, and even extinct mammoths, rhinoceros, bisons, horses and other animals of the Mammoth fauna. A series of unique paleontological discoveries were made on the territory of Yakutia, due to the widespread permafrost (Lazarev, 2008). Unique Ice Age animal remains found in Yakutia have been studied for more than 200 years, since the late 18th century. All these discoveries contributed to the foundation of the Museum of Mammoth in 1991. The Mammoth Museum is a specialized research institution that was founded at the initiative of the prominent Yakut paleontologist P. A. Lazarev. It was created as a scientific and cultural center for the study of the Mammoth fauna and its natural environment during the Ice Age (Lazarev et al., 1998).

Currently, the skeletal collection of the P. A. Lazarev Mammoth Museum contains 1700 items, including the largest collection of fossil animals and frozen soft tissues. The entirety of the Mammoth Museum's collections is of great importance for the knowledge of organic evolution during the Quaternary period, to educate the public about the flora and fauna of the Ice Age, about the paleoecological conditions of the Mammoth fauna habitat, re-aclimatization of the contemporaries of the mammoth in Yakutia – muskox and bison. These collections might also be used in the possibility of recovery as a species of mammoth by cloning. Also, they represent invaluable discoveries for sparking interest for natural history in people and they contribute to the ecological culture of society.

P. A. Lazarev Mammoth Museum is a unique museum, which continues to accumulate paleontological collections, generating a huge interest not only for the visitors of the museum, but also for the development of various research projects, exhibitions and documentaries.

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# POSTER PRESENTATIONS

# Preliminary morphometric study of *Hypanis plicata* shells of the Razelm lake

Alberto M. GÁNDARA[1], Mihaela Isabela VADANA[1], Larisa-Bianca DUMITRESCU[1], Oana Paula POPA[1], Luis Ovidiu POPA[1]

[1]"Grigore Antipa" National Museum of Natural History, Şos. Kiseleff no. 1, 011341 Bucharest, Romania, e-mails: alberto.gandara@antipa.ro; mvadana@antipa.ro; larisad@antipa.ro; oppopa@antipa.ro; popaluis@antipa.ro

**Key words:** Lymnocardiinae, biodiversity, Danube Delta, Pontocaspian region fauna, bivalve, relict species

Lymnocardiinae species (Bivalvia: Cardiidae) are brackish burrower taxa that need waters rich in organic material and planktonic elements, which can be abundantly found in estuaries, mouth of rivers, lagoons or coastal areas. Current Lymnocardiinae species, with a Pontocaspian distribution, are relict species of a group that was abundant and widespread through the Pontocaspian basin (Caspian Sea, Aral Sea, Black Sea, Marmara Sea and associated lagoons) during the geological past, but now only a few genera exist. *Hypanis plicata* (Milachevitch, 1916) is a Lymnocardiinae species previously recorded in the Razelm-Sinoe lagoon complex but with a lack of information compared with other better known related taxa.

The aim of this study was to identify the growing pattern of the species in order to increase the information regarding to this taxa, which nowadays seems to face a reduction in its abundance and distribution range, based on rather scarce studies. Here we report a morphometric analysis of *Hypanis plicata* shells (n = 111) collected in September 2015 on a dike in Sarichioi, on the shore of the Razelm Lake. In order to identify the growing pattern (allometric *vs.* isometric growth), we performed a fitting curve analysis. The results obtained revealed a positive allometric growth pattern in height *vs.* width and in length *vs.* width, and an isometric growth pattern in length *vs.* height.

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# Identification of tenuipalpid mites associated with oak trees in Nahavand county, Iran

Fatemeh SABERFAR, Mohammad KHANJANI, Masoumeh KHANJANI

Department of Plant Protection, College of Agriculture, Bu–Ali Sina University, Hamedan, Iran, postal code: 6517833131. Fzeshti@gmail.com, mkhanjani@gmail.com, Mh.khanjani86@gmail.com.

**Key words:** pest, ferns, *Agybtobia*, mites.

The family Tenuipalpidae Berlese, 1913 (Acari: Prostigmata) is worldwide in distribution and includes several economically important pest species (Mesa et al., 2009; Khanjani et al., 2012). The family Tenuipalpidae comprise over 1,100 described species in 38 genera that are parasitic on flowering plants, conifers and ferns. The genera *Brevipalpus* and *Tenuipalpus* are highly speciose, the former with more than 307 and the latter with 282 described species (Mesa et al., 2009). To date, 13 species of the genus *Agybtobia*, 18 species of the genus *Cenopalpus,* 2 species of the genus *Phytopalpus* and 9 species of the genus *Tenuipalpus* have been recorded from Iran. During 2013-2014, fauna of the tenuipalpid mites associated with oak trees in Nahavand were studied. In this order, leaves of oak trees were taken to the laboratory. Mites were removed from plant leaves with a No. 0 paint brush under a stereomicroscope and directly mounted in Hoyer's medium. In total 5 species belonging to 4 different genera were identified. *Cenopalpus bakeri* had high population on oak trees. Identified species are listed as follow: genus *Aegyptobia* Sayed 1950: *A. persica* Khosrowshahi & Arbabi, 1997; genus *Cenopalpus* Pritchard & Baker, 1958: *C. meyerae* Khosrowshahi, 1991; *C. bakeri* Duzgunes, 1967; genus *Phytoptipalpus* Tragardh, 1904*: P. rosae* (Mitrofanov & Strunkova, 1978); genus *Tenuipalpus* Donnadieu, 1875: *T. parsii* Khosrowshahi & Arbabi, 1997.

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# Fauna of family Tenuipalpidae (Acari: Prostigmata) in Qom vicinities, Iran

Samira BAKHSHI, Mohammad KHANJANI, Masoumeh KHANJANI

Department of Plant Protection, College of Agriculture, Bu–Ali Sina University, Hamedan, Iran, postal code: 6517833131, Samirabakhshi92@gmail.com.

**Key words:** false Spider mite, worldwide, greenhouses, plants, damage.

False spider mites were described by Berlese in 1913. Commonly known as flat mites or false spider mites, they are distributed worldwide. All members of this family are phytophagous and make damage on the plant hosts. They are found in greenhouses, on ornamental plants and on a wide range of other plants (Khanjani et al., 2012, 2013). During 2014-2015, a research project was conducted to study the false spider mites in Qom vicinities. In this respect, leaves of trees which were infested by false spider mites were collected and taken to the laboratory for being processed. Mites were removed from plant leaves with a No. 0 paint brush under a stereomicroscope (Wild M8) and directly mounted in Hoyer's medium. In total, 13 species, belonging to 5 different genera were identified, namely: *Aegyptobia tragardhi* Sayed, 1950; *A. beglarovi* Livschitz and Mitrofanov, 1967; *Cenopalpus khosrowshahi* Khanjani et al., 2012; *C. prunusi* Khanjani et al., 2012; *C. bakeri* Duzgunez, 1967; *C. irani* Dosse, 1971; *C. crataegi* Dosse, 1971; *C. lanceolatisetae* Attiah, 1956; *C. meyerae* Khosrowshahi, 1991; *C. saryabiensis* Akbar and Chaudhri, 1958; *Phytoptipalpus salicicola* (Al-Gboory, 1987); *Pseudoleptus kermanshahiensis* Khanjani et al., 2012; *Tenuipalpus punicae* Pritchard & Baker, 1958. Among them, *A. tragardhi, C. bakeri* and *T. punicae* were found in high populations on cedar, prune and pomegranate trees respectively.

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# Fauna of family Raphignathidae (Acari: Trombidiformes) in Shiraz town, Iran

Samira BAKHSHI, Mohammad KHANJANI

Department of Plant Protection, College of Agriculture, Bu–Ali Sina University, Hamedan, Iran, postal code: 6517833131, Samirabakhshi92@gmail.com.

**Key words:** Acari, fauna, Raphignathidae, Shiraz town, Iran.

Many species of the superfamily Raphignathoidea Kramer (Acari: Prostigmata) are predators of spider and eriophyoid mites and scale insects in agriculture and forestry (Gerson et al., 2003). Raphignathidae is the oldest family in superfamily Raphignathoidea and belongs to the Trombidiformes (Walter et al., 2009). They are predaceous mites and can be found underneath tree bark, in lichens, moss, leaf litter, pigeon nest and intestine of wedded seal, in soil, on a wide range of plants and in house dusts (Fan & Yin, 2000, Khanjani & Ueckermann 2003). This family are easily recognized by the fused cheliceral bases, forming a stylophore, cervical peritremes not embedded in dorsal surface of stylophore and confluent coxae. Members of the genus Raphignathus Dugés, 1834 are mostly active in soil and feed on the small arthropods so they can be considered as beneficial control agents in soil, in decreasing phytophagous arthropods. In order to study the family Raphignathidae in Shiraz, mites were extracted from soil using a Berlese-Tullgren funnel. Specimens were cleared in Nesbitt's fluid, mounted in Hoyer's medium and examined at 1000× magnification under an Olympus BX41 phase contrast microscope. In this study, three species, belonging to one genus were identified, namely: *R. gracilis* (Rack,1962); *R. giselae* Meyer et Ueckemann, 1989; *R. hecmataniensis* Khanjani et Ueckermann, 2003.

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# Re-description of female and immature stages of *Bryobia rubrioculus* Scheuten (Acari: Tetranychidae) from western Iran

Nazila HONARPARVAR, Mohammad KHANJANI,
Mohammad AHMAD HOSEINI

Department of Plant Protection, College of Agriculture, Bu-Ali Sina University, Hamedan, Iran, e-mail: honarparvarnazila@yahoo.com; mkanjani@gmail.com; mahmadhoseini@ yahoo.com

**Key word:** Acari, Tetranychidae, sweet cherry, Iran.

Brown mite, *Bryobia rubrioculus*, is a species found on aerial position on deciduous and coniferous trees. *B. rubrioculus* attacks a number of fruit trees in the west of Iran and the highest population of the brown mite was observed on the sweet-cherry as a predominant mite (Khanjani & Haddad Irani-Nejad, 2006; Honarparvar et al., 2013). In late June 2014, the brown mite was collected from sweet cherry orchards in Hamedan provinces. Immature stages (larvae, protonymph and deutonymph) and females of *B. rubrioculus* Scheuten, reared on sweet cherry for 2 generations in germinator under constant condition: (25 ± 0.5) °C, (L: D) (16:8), and (60 ± 5) RH, in the lab of Bu Ali-Sina university, Hamedan, Iran, are re-described and illustrated in the current work. Furthermore, a key to Iranian species of the genus *Bryobia* is presented.

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# Fauna of the genus *Aceria* (Acari: Eriophydae) in Hamedan Province, Iran

Soheila JAFARI, Mohammad KHANJANI, Masoumeh KHANJANI

Department of Plant Protection, College of Agriculture, Bu–Ali Sina University, Hamedan, Iran, postal code: 6517833131, emails: so.jafari48@gmail.com; mkhanjani@gmail.com.

**Key words:** *Aceria*, eriophioid mites, Hamedan Province.

The Eriophyoidae, also known as the Tetrapodidi or four-legged mites, are worldwide in distribution (Krantz & Walter, 2009). Eriophyoid mites are obligatory plant feeders and are well adapted to living on plants (Lindquist & Oldfield, 1996). Often their infestation and feeding behaviour leads to plant injury that manifests in the form of russeting, gall formation, bronzing, browning, silvering or curling of leaves and deformed or stunted buds (Menon et al., 2014). Family Eriophyidae is one of largest family of Eriophyoidea, with approximately 227 genera and over 3000 known species, of which the genus *Aceria* contributes about 25%–30% of worldwide biodiversity. 39% of the reported species of eriophyioid mites in Iran belongs to the genus *Aceria* (Xue et al., 2009). During 2013-2014, a research project was conducted to study the genus *Aceria* Keifer, 1944 in Hamedan province. In this concern, leaves of walnut, oleaster, Russian knapweed, European pennyroyal, common lambsquarters and knotgrass, which were infested by eriophyioid mites, were collected and directly mounted in Hoyer's medium. In total, 6 species were identified, namely: *Aceria tristriatus* (Nalepa, 1891); *Aceria elaeagnicola* Farkas, 1963; *Aceria acroptiloni* Shevtchenko and Kovalev, 1974; *Aceria* n. sp.; *Aceria chenopodia* Xue et al., 2009; *Aceria mashhadiensis* Xue, et al., 2009. Among them *Aceria elaeagnicola*, *Aceria chenopodia* and *Aceria tristriatus* were found abundantly and almost with wide distribution in these areas.

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# Predatory mites of superfamily Raphignathoidea associated with spider mites in different orchards of Tuyserkan, Hamedan Province, Iran

Mehdi KARIMI, Mohammad KHANJANI, Masoumeh KHANJANI

Department of Plant Protection, College of Agriculture, Bu–Ali Sina University, Hamedan, Iran, postal code: 6517833131, Emails: Me.karimi92@basu.ac.ir, mkhanjani@gmail.com.

**Key words:** Spider mites, insects, *Raphignathus*, infested, Stigmaeidae.

Members of superfamily Raphignathoidea are important biological control agents of spider mites, eriophyid mites, and scale insects in agriculture and forestry. They have worldwide distribution in most of geographical regions (Fan & Zhang 2005). Up to date, 18 species of genus *Eustigmaeus*, 12 species of genus *Raphignathus*, 7 species of the genus *Favognathus*, 3 species of the genus *Zetzellia* and 9 species of the genus *Molothrognathus* have been recorded from Iran (Bayzavi et al., 2013). During 2013-2015, Raphignathoid mites associated with spider mites in different orchards of Tuyserkan were studied. In this order, leaves of apricot, plum, almond, peach, apple trees which were infested by two spotted spider mites were collected in some parts of Tuyserkan and taken to the laboratory. Mites were removed from plant leaves with a No. 0 paint brush under a stereomicroscope and directly mounted in Hoyer's medium. In total, 7 species, belonging to genera *Eustigmaeus*, *Favognathus*, *Molothrognathus*, *Raphignathus* and *Zetzellia* were identified. Among them, *Zetzellia pourmirzai* and *Zetzellia mali* were found abundantly and almost with wide distribution in these areas. Identified species are listed as follow: *Eustigmaeus seemani* Khanjani et al., 2013; *Favognathus guilanicus* Khanjani et al., 2014; *Molothrognathus mehrnejadi* Liang & Zhang, 1997; *Raphignathus zhaoi* Hu et al., 1995; *Raphignathus gracilis* (Rack, 1962); *Zetzellia pourmirzai* Khanjani & Ueckermann, 2008; *Zetzellia mali* (Ewing, 1917).

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# Phytoseiid mites associated with two spotted spider mites of some stone fruit trees in Kohnush region, Hamedan Province, Iran

Mehdi KARIMI, Mohammad KHANJANI, Bahman ASALI FAYAZ

Department of Plant Protection, College of Agriculture, Bu Ali–Sina University, Hamedan, Iran; E-mails: me.karimi92@basu.ac.ir; mkhanjani@gmail.com; basalifayaz@gmail.com

**Key words:** Mite, predator, phytoseiidae, phytophagous, tetranychid, *T.* (*A.*) *bagdasarjani*, *T.* (*A.*) *khosrovensis*.

The member of phytoseiid mites (Mesostigmata: Phytoseiidae) are well known, cosmopolitan and important predatory mites in the subclass Acari and already some of them are introduced as biological control agents of some small insect pests such as thrips and phytophagous mites especially TSSM*, Tetranychus urticae* Koch (Prostigmata: Tetranychidae), with economic importance and extinctive host range (Chant & McMurtry, 1994; Asali Fayaz et al., 2011). In this study, the specimens were collected from some aerial parts of stone fruit trees such as peach, plum, sweet cherry and sour cherry (by shaking and beating method of the shoots and foliages on withe tray) in 2014-2015. The mites were directly mounted on slides in Hoyer's medium, using a stereomicroscope (Walter, & Krantz, 2009). The slides were dried in an oven at about 50 °C and examined under an Olympus BX51 microscope (Differential Interference Contrast). All specimens are deposited in the Collection of the Acarology Laboratory, University of Bu–Ali Sina, Hamedan, Iran. In this survey, *Typhlodromus* (*Anthoseius*) *bagdasarjani* Wainstein & Arutunjan, 1967 and *Typhlodromus* (*Anthoseius*) *khosrovensis* Arutunjan, 1971 were commonly found in the region considered. The phytoseiid mites play an important role in decrease of the Tetranychid mite damages in the region. Consequently, chemical control will be reduced.

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# Faunistic study of the genera *Brevipalpus* and *Cenopalpus* (Acari: Tenuipalpidae) in North and West of Iran

Masoumeh KHANJANI[1], Mohammad KHANJANI[1], Owen D. SEEMAN[2], Fatemeh AMINI[1]

[1]Department of Plant Protection, College of Agriculture, Bu – Ali Sina University, Hamedan, Iran, postal code: 6517833131, email: Mh.khanjani86@gmail.com.
[2]Manager of Arachnida Collection, "Queensland Museum", South Brisbane, Australia, email: owen.seeman@qm.qld.gov.au.

**Key words:** feed, damage, species, host, phytophagous.

Members of family Tenuipalpidae are phytophagous and some of their damages on the plant hosts are economically important. They feed directly from the epidermal cell and sub epidermal tissue, like mesodermalcells of the stems, leaves and fruits (Beard et al., 2012). This family comprises over 1,100 species in 38 genera. *Brevipalpus* Donnadieu, 1875 and *Cenopalpus* Pritchard and Baker, 1958 are two of the largest genera of Tenuipalpidae. Genus *Cenopalpus* is more biogeographically restricted than *Brevipalpus*, being absent from the Nearctic and Neotropical regions, where the diversity of *Brevipalpus* is greatest (Mesa et al., 2009). To date, 7 species of *Brevipalpus* and 18 species of *Cenopalpus* have been recorded from Iran. During 2013-2014, a research was conducted on genera *Brevipalpus* and *Cenopalpus* in north and west of Iran. In this concern leaves of trees and grass clumps which were infested by false spider mites were collected and taken to the laboratory. Mites were removed from plant leaves with a No. 0 paint brush under a stereomicroscope (Wild M8) and directly mounted in Hoyer's medium. In total, 13 species were identified, namely: *Brevipalpus* Donnadieu, 1875: *B. lewisi* McGregor, 1949; *B. obovatus* Donnadieu, 1875; *B. olearius* Sayed, 1950 and *B. phoenicis* (Geijkes, 1939); *Cenopalpus* Pritchard and Baker, 1958: *C. ruber* Wainstein, 1960; *C. meyerae* Khosrowshahi, 1991; *C. rubusi* Khanjani et al., 2012; *C. prunusi* Khanjani et al., 2012; *C. khosrowshahi* Khanjani et al., 2012; *C. bakeri* Duzgunes, 1967; *C. crataegi* Dosse, 1971; *C. irani* Dosse, 1971; *C. lanceolatisetae* Attiah, 1956. Among them *Cenopalpus irani and Cenopalpus bakeri* were found abundantly and almost with wide distribution in these areas.

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# Fauna of Raphignathoidea (Acari: Prostigmata) in Kurdistan Province, Iran

Fatemeh AMINI, Mohammad KHANJANI, Masoumeh KHANJANI

Department of Plant Protection, College of Agriculture, Bu–Ali Sina University, Hamedan, Iran, postal code: 6517833131, emails: fatemehamini362@yahoo.com, mkhanjani@gmail.com, Mh.khanjani86@gmail.com.

**Key words:** family, distribution, abundant, mite, antarctic.

Superfamily Raphignathoidae comprises about 770 species, and 57 genera in 11 families. They are worldwide in distribution, abundant in most of the geographical regions, and they even occur in the Antarctic region (Fan & Zhang, 2005). Of which the families Barbutiidae, Caligonellidae, Camerobiidae, Cryptognathidae, Eupalopsellidae, Raphignathidae and Stigmaeidae have been recorded from Iran (Bayzavi et al., 2013). During 2012-2015, fauna of the superfamily Raphignathoidea was studied in Kurdistan province. In this order, little, soil and leaves samples from Kurdistan province were taken and transferred to the laboratory of Acarology of Bu-Ali Sina University, Hamedan, Iran. Mites extracted by Berlese funnel and mounted directly in Hoyer's medium (Khanjani et al., 2013). In total 23 species, belonging to 10 genera from 5 families were collected and identified. Identified species are listed as follow: Caligonellidae**:** *Molothrognathus fulgidus* Summers & Schlinger, 1955; *Molothrognathus mehrnejadi* Liang & Zhang, 1997; *Neognathus terrestris* Summers & Schlinger, 1955; Camerobiidae**:** *Neophyllobius asali* Khanjani & Ueckermann, 2006; *Neophyllobius edwardi* Khanjani & Ahmad Hoseini, 2013; Cryptognathidae**:** *Favognatus alvandi* Khanjani & Khanjani, 2014; Raphignathidae**:** *Raphignathus collegiatus* Atyeo & Crossley, 1961; *Raphignathus giselae* Smith-Meyer & Ueckermann, 1989; *Raphignathus gracilis* Rack, 1962; *Raphignathus hatami* Khanjani & Pishevar, 2013; *Raphignathus hecmatanaensis* Khanjani & Ueckermann, 2003; *Raphignathus protaspus* Khanjani & Ueckermann, 2003; *Raphignathus zhaoi* Hu & Liang, 1995; Stigmaeidae**:** *Eustigmaeus ioanninensis* Kapaxidi & Papadoulis, 1999; *Eustigmaeus nasrinae* Khanjani & Ueckermann, 2002; *Eustigmaeus segnis* Koch, 1836; *Eustigmaeus setiferus* Bagheri et al., 2011; *Ledermuelleriopsis ariyai* Khanjani et al., 2012; *Ledermuelleriopsis zahiri* Khanjani & Ueckermann, 2002; *Prostigmaeus khanjani* Bagheri & Ghorbani, 2010; *Stigmaeus pilatus* Kuznetzov,1978; *Stigmaeus kurdistaniensis,* 2014; *Zetzellia mali* Ewing, 1917. *Favognathus guilanicus*, *Panonychus citri* & *Eustigmaeus segnis*. Among them, *Raphignathus hecmatanaensis* and *Raphignathus protaspus* had high population on different habitats and feed on phytophagous mites and effective in natural equilibrium.

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# Fauna of superfamilies Raphignathoidea and Tetranychoidea (Acari: Prostigmata) in Ramsar town, Mazandaran Province, Iran

Azadeh NADIM, Masoumeh KHANJANI,
Mohammad KHANJANI, Fatemeh SABERFAR

Department of Plant Protection, College of Agriculture, Bu–Ali Sina University, Hamedan, Iran, postal code: 6517833131. Email: azadenadim93@gmail.com

**Key words:** Spider mite, insect, *Raphignathus*, phytophagus, Stigmaeidae.

Members of superfamily Raphignathoidea are important biological control agents of spider mites, eriophyid mites and scale insects in agriculture and forestry. They were found in various ecosystems: foliage, branches, trunks, moss and lichen, litter, soil, animal nests, stored products and even in house dust (Fan & Zhang, 2005). Superfamily Tetranychoidea are obligatory phytophagus mites assigned to five recognized families. Most of species that are of major economic importance are contained in two families, Tetranychidae or spider mites and Tenuipalpidae or false spider mites (Krantz & Walter, 2009). During 2014, fauna of the superfamilies Raphignathoidea and Tetranychoidea in Ramsar town were studied. In this order, samples were collected and directly mounted in Hoyer's medium. In total 16 species, belonging to 9 genera and 6 families were identified. Among them, 7 species belonging to families Cryptognathidae, Raphignathidae and Stimaeidae (superfamily Raphignathoidea) and 9 species belonging to families Tenuipalpidae, Tetranychidae and Tuckerellidae (superfamily Tetranychoidea). *Favognathus guilanicus*, *Panonychus citri* and *Eustigmaeus segnis* had high population on sweet orange trees and lichen respectively. Identified species are listed as follow: Stigmaeidae: *Eustigmaeus*: *E. seemani* Khanjani et al., 2013; *E. segnis* (Koch, 1836); *E. nasrinae* Khanjani & Ueckermann, 2002; Cryptognathidae: *Favognathus*: *F. esfahaniensis* Khanjani et al., 2014*; F. guilanicus* Khanjani et al., 2014; Raphignathidae: *Raphignathus*: *R. zhaoi* Hu et al., 1995; *R. hecmataniensis* Khanjani & Ueckermann, 2002; Tenuipalpidae: *Brevipalpus*: *B. lewisi* McGregor, 1949; *B. obovatus* Donnadieu, 1875; *B. olearius* Sayed, 1950; *Cenopalpus*: *C. ruber* Wainstein, 1960; *C. meyerae* Khosrowshahi, 1991; *Tetranychidae*: *Panonychus citri* (MaGregor, 1916); *Oligonychus* sp.; *Tetranychus urticae* Koch, 1836; *Tuckerellidae*: *Tuckerella japonica* Ehara, 1975.

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# Fauna of the family Stigmaeidae (Acari: Prostigmata) in Alashtar town, Lorestan Province, Iran

Alireza NADRI, Masoumeh KHANJANI,
Mohammad KHANJANI, Mohammad Reza AMIN

Department of Plant Protection, College of Agriculture, Bu-Ali Sina University, postal code: 6517833131, Hamedan, Iran, e-mail: alireza_nadri64@yahoo.com, mh.khanjani86@gmail.com.

**Key words:** predator, world, species, soil, Raphignathoidea.

Stigmaeidae is the largest family within Raphignathoidea which was established by Oudemans (1931). Members of this family are predators and feed on arthropods, ectoparasites of dipterans and pollen feeders and occur all over the world (Fan & Zhang, 2005). This family currently contains 32 genera, of which 12 genera have been recorded from Iran (Beyzavi et al., 2013). To date, 8 species of the genus *Cheylostigmaeus***,** 18 species of the genus *Eustigmaeus*, 7 species of the genus *Ledermuelleriopsis* and 29 species of the genus *Stigmaeus* have been recorded from Iran. During 2011-2013, fauna of the family Stigmaeidae in Alashtar town was studied. In this order, samples were collected from litter and soil under common reed, hawthorn, gum, oak, wild almond, common fig trees, pear trees and taken to the laboratory. Mites extracted by Berlese funnel and mounted directly in Hoyer's medium. In total 6 species, belonging to 4 different genera were identified. Among them, *Cheylostigmaeus howellsi* and *Stigmaeus pilatus* were found in populations on common reed plants and oak trees, respectively. Identified species are listed as follow: genus *Cheylostigmaeus* Willmann, 1951: *C. howellsi* Evans, 1954; genus *Eustigmaeus* Berlese, 1910: *E. dogani* Khanjani et al., 2014; *E. segnis* (Koch, 1836); genus *Ledermuelleriopsis* Willmann, 1953; *L. zahirii* Khanjani & Ueckermann, 2002; genus *Stigmaeus* Koch, 1836: *S. boshroyehensis* Khanjani et al., 2010; *S. pilatus* Kuznetzov, 1978.

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# Fauna of the families Stigmaeidae and Cryptognathidae (Acari: Prostigmata) associated with oak trees in Nahavand County, Iran

Shahram PISHEHVAR, Mohammad KHANJANI,
Fatemeh SABERFAR, Masoumeh KHANJANI

Department of Plant Protection, College of Agriculture, Bu–Ali Sina University, Hamedan, Iran, postal code: 6517833131, Emails: pishehvar65@gmail.com, mkhanjani@gmail.com.

**Key words:** soil, stored products, spider mites, forestry.

Members of superfamily Raphignathoidea are important biological control agents of spider mites, eriophyid mites, and scale insects in agriculture and forestry. They were found in various ecosystems: foliage, branches, trunks, moss and lichen, litter, soil, animal nests, stored products, and even in house dust. Family Stigmaeidae is the largest family within Raphignathoidea, which was established by Oudemans (1931). This family currently contains 32 genera, of which 12 genera are recorded from Iran (Bayzavi et al., 2013). Currently the family Cryptognathidae contains the genera *Cryptognathus* Kramer, 1879; *Favognathus* Luxton, 1973; and *Cryptofavognathus* Doğan & Dönel, 2010. *Cryptognathus* comprises 19 species recorded from the Palaearctic, Nearctic and Australian regions and *Favognathus* has 33 species and occurs all over the world except the Antarctic region (Khanjani et al., 2014). During 2013-2014, fauna of the families Cryptognathidae and Stigmaeidae associated with oak trees in Nahavand were studied. In this order, litter and soil samples were taken to the laboratory. Mites extracted by Berlese funnel and mounted directly in Hoyer's medium. In total 9 species belonging to 3 genera were identified. *Zetzelia kamali* had high population on oak trees. Identified species are listed as follow: *Eustigmaeus dogani* Khanjani et. al., 2011*; Eustigmaeus ioanninensis* Kapaxidi & Papadoulis 1999; *Eustigmaeus sculptus* Doğan & Fan, 2003; *Eustigmaeus segnis* (Koch, 1836); *Stigmaeus shendabadiensis* Haddad Irani-Nejad & Lotfollahi, 2010; *Zetzellia kamalii* Kheradmand & Fathipour, 2007; *Favognathus mirazii* Khanjani & Ueckermann, 2008; *Favognathus alvandii* Khanjnai et al., 2014; *Favognathus guilanicus* Khanjnai et al., 2014.

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# Mesovoid Shallow Substratum (MSS) - ecological microrefuge for detritivore soil-dwelling species - Case study on Oribatid mites (Acari: Oribatida) from Piatra Craiului Mountains, Romania

Ioana NAE

Romanian Academy, Institute of Speleology "Emil Racovitza", Biospeology and Karst Edaphobiology Compartment, 13 Septembrie, No. 13, Sector 5, 050711, Bucharest, Romania. ioana.iser@gmail.com

**Key words:** oribatida, mites, MSS, ecology, Piatra Craiului, scree.

New studies suggested that Mesovoid Shallow Substratum (MSS), mainly represented by screes, plays an important role in the life cycle of arthropod species, especially in the structure and dynamics of soil fauna. We investigated the oribatid mite communities from both MSS and edaphic environments, from Piatra Craiului Mountains, using Barber traps and drillings, placed in three sample stations, monthly, for two years. Temperature and relative humidity were also recorded. We identified 97 oribatid species and underlined the importance of scree habitats (MSS) as ecological microrefuge for detritivour mite species.

# Contribution to the study of the harvestmen fauna (Arachnida: Opiliones) from Latorița Valley (Romania)

Anda Felicia BĂBĂLEAN

University of Craiova, Faculty of Horticulture, Department of Biology and Environmental Engineering, 13 A. I. Cuza Street, 200583, Craiova, Romania, e-mails: anda_babalean@yahoo.com; afbabalean@gmail.com

**Key words:** Opiliones, faunistic list, Latorița Valley, *Leiobunum tisciae*, taxonomic features.

The paper presents the results of a faunistic investigation in Latorița Valley between Ciunget Village and Petrimanu Lake during August 2014 - August 2015.

The faunistic list includes 12 species identified by the keys provided by Martens (Martens, 1978) and Šilhavý (Šilhavý, 1956): *Holoscotolemon jaqueti* (Corti, 1905), *Paranemastoma silli* (Herman, 1871), *Mitostoma chrysomelas* (Hermann, 1804), *Trogulus tingiformis* C. L. Koch, 1848, *Ischyropsalis manicata* L. Koch, 1865, *Phalangium opilio* Linnaeus, 1761, *Oligolophus tridens* (C. L. Koch, 1836), *Lacinius dentiger* (C. L. Koch, 1848), *Lacinius ephipiatus* (C. L. Koch, 1835), *Mitopus morio* (Fabricius, 1799), *Gyas titanus* Simon, 1879 and *Leiobunum tisciae* Avram, 1968. Five species are new reports in this area: *Mitostoma chrysomelas*, *Trogulus tingiformis*, *Ischyropsalis manicata*, *Gyas titanus*, *Leiobunum tisciae*.

Some taxonomic features of the collected *Leiobunum tisciae* (body length, cephalotorax and abdomen, chelicera, pedipalpus, legs, penis, ovipositor and seminal receptacles) are compared with those given by literature for other European Leiobunum species: *Leiobunum limbatum* L. Koch, 1861 (Martens, 1978); *Leiobunum tisciae* Avram, 1968 (Avram, 1968; Martens, 1978) and *Leiobunum rupestre* (Herbst, 1799) (Martens, 1978). The comparison points out that the most reliable features in identifying *Leiobunum tisciae* are: the black apical excrescence on the lateral-external side of the tibia of the pedipalp, the penis and the seminal receptacles.

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# Faunistic overview of Pholcid spiders (Araneae: Pholcidae) in Romania

Liviu Aurel MOSCALIUC[1], Mariia FEDORIAK[2]

[1]"Grigore Antipa" National Museum of Natural History, Şos. Kiseleff 1, 79744 Bucharest 2, Romania, e-mail: liviu.moscaliuc@antipa.ro
[2]Yuri Fedkovych Chernivtsi National University, 2 Kotsyubynskyi st., 58012, Chernivtsi, Ukraine, e-mail: m.m.fedoriak@gmail.com

**Key words:** Pholcidae, România, new record.

Pholcids are spiders relatively easy to recognize by a combination of characters such as the general arrangement of eyes (six eyes arranged in two groups and one median pair, the latter may be absent), pseudo-segmented tarsi, extremely long and thin legs (in part), entirely modified male pedipalp, modified male chelicerae (with apophyses, modified hairs, cones, spines – related, in this group, to the structure and modifications of the epigyne), a very high clypeus etc. They can be found in a wide variety of microhabitats but most of them prefer protected spaces as the underside of rocks, logs and leaves, crevices, tree holes, caves. Many species are known as synanthropic.

Several pholcid spider species have been recorded in Romania up to the present time.

Four species: *Holocnemus pluchei* (Scopoli, 1763) – unconfirmed, *Hoplopholcus forskalli* (Thorell, 1871), *Pholcus opilionoides* (Schrank, 1781) and *Pholcus phalangioides* (Fuesslin, 1775) have been recorded prior to the year 2000 when the latest Romanian checklist was published.

Since then, three more pholcid species have been found living in what is the geographical region of present day Romania: *Spermophora senoculata* (Duges, 1836), *Pholcus ponticus* Thorell, 1875 and *Pholcus crassipalpis* Spassky, 1937 – new record. *P. crassipalpis* is part of the *P. opilionoides* species group and the most easternly of its representatives, ranging from Romania (new western limit) to western Kazakhstan and Orenburg Oblast in Russia.

A comparative visual analysis of these species is presented as well as a map of known localities and records.

# The Diplopoda and Chilopoda of the Leaota Mountains (Southern Carpathians, Romania)

Andrei GIURGINCA[1], Ştefan Cătălin BABA[1],
Leonard DOROBAŢ[2], Ionuţ POPA[1]

[1]"Emil Racoviţă" Institute of Speleology, 13 Septembrie Road, no. 13, Sector 5, 050711 Bucharest, Roumania, e-mail: sankao2@yahoo.com; cata_stef92@yahoo.com; ionutpopaag@yahoo.com
[2]University of Piteşti, Faculty of Sciences, Department of Natural Sciences, 1 "Târgu-din-Vale" St., 110040 Piteşti, Romania, e-mail: leonard.dorobat@upit.ro

**Key words:** Leaota Mountains, Diplopoda, Chilopoda.

The Leaota Mountains represent one of the less known geographic areas from the point of view of the faunistic studies concerning the Myriapoda. Our work is the first attempt to investigate the Diplopoda and the Chilopoda of the Leaota Mountains. For this aim, we used Barber traps and drillings placed on stations from the following locations: Pârâul lui Berbece (one Barber trap), Valea Ghimbavului (three drillings), Rudăriţa (five Barber traps and three drillings), Pârăul Popii (five Barber traps and four drillings), Ghimbav (five Barber traps), Valea Cheii (three drillings) and Valea Badenilor (five Barber traps). The sampling took place between the 5th of July 2014 and the 15th of August 2015.

The 9 species of diplopods belong to 7 families: Julidae (*Leptoiulus trilobatus* Verhoeff, 1894, *Unciger transsilvanicus* Verhoeff, 1899 and *Megaphyllum projectum* Verhoeff, 1894), Paradoxosomatidae (*Strongylosoma stigmatosum* Eichwald, 1830), Polydesmidae (*Polydesmus burzenlandicus* Verhoeff, 1925), Mastigorophyllidae (*Heterobraueria scopifera* Verhoeff, 1898), Glomeridae (*Glomeris connexa* C. L. Koch, 1847), Trachysphaeridae (*Trachysphaera acutula* Latzel, 1884) and Polyzoniidae (*Polyzonium germanicum* Brandt, 1837).

The 7 species of chilopods are included in 3 families: Lithobiidae (*Lithobius tenebrosus* Meinert, 1872, *Lithobius muticus* C.L. Koch, 1847, *Lithobius parietum* Verhoeff, 1899 and *Harpolithobius radui* Matic, 1955), Linotaeniidae (*Strigamia engadina* Verhoeff, 1935 and *Strigamia transsilvanica* Verhoeff, 1928) and Cryptopidae (*Cryptops hortensis* Donovan, 1810).

The differences in the number of species found in the sampling stations are detailed.

# Towards a revision of the *Eucyclops* (Crustacea: Copepoda) in Ukraine

Liudmyla GAPONOVA[1], Maria HOLYNSKA[2]

[1]Institute for Evolutionary Ecology of National Academy of Sciences of Ukraine, Laboratory of Preservation and Fauna Renewal, Ukraine, 03143, Kiev, 37 Lebedeva str., e-mail: lgaponova@gmail.com;
[2]Museum and Institute of Zoology, Polish Academy of Sciences, Laboratory of Systematics and Biogeography, Poland, 00-679, Warsaw, Wilcza 64, e-mail: mariahol@miiz.waw.pl

**Key words:** Crustacea, Copepoda, freshwater, *morphology,* cryptic species, geographic distribution.

The genus *Eucyclops* Claus 1983 (>110 species) is one of the largest cyclopid genera, distributed worldwide. About 25 species occur in Europe and ca. 10 live in Ukraine. Since the last fauna monograph of Monchenko (1974) there has been a significant progress in the morphology-based systematics of the Cyclopidae and the *Eucyclops* in particular (Alekseev & Defaye, 2011), providing the base for a revision of the genus in Ukraine.

The results of the crossbreeding studies based on material from Ukraine indicated the existence of ecologically different cryptic species within the *Eucyclops serrulatus*-group (Monchenko et al., 2014), and urged us to revise the diagnostic value of the previously used morphological characters in species identification.

Herewith we report on the first results of a long-term study on the *Eucyclops* of Ukraine. Beyond traditionally used characters we also examined the antenna - mouthparts - and leg morphology in the specimens recently collected from different parts of the country. Five species, *Eucyclops macruroides* (Lilljeborg, 1901)*, E. macrurus* (Sars, 1863)*, E. roseus* Ishida, 1997, *E. serrulatus* (Fischer, 1851), *E. speratus* (Lilljeborg, 1901) have been identified so far. *Eucyclops serrulatus* showed three morphotypes differing in seta setulation and surface ornamentation characters, which, as the preliminary observations suggest, might be determined by the environments.

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# New records of Collembola and Araneae species for the Romanian fauna (Leaota Massif, Southern Carpathians)

Ionuţ POPA[1], Augustin NAE[1], Andrei GIURGINCA[1], Leonard DOROBĂŢ[2]

[1]"Emil Racoviţă" Institute of Speleology, Romanian Academy, 13 "13 Septembrie" St., 050711 Bucharest 5, Romania, e-mails: ionutpopaag@yahoo.com, augustin.iser@gmail.com, sankao2@yahoo.com
[2]University of Piteşti, Faculty of Sciences, Department of Natural Sciences, 1 "Târgu-din-Vale" St., 110040 Piteşti, Romania, e-mail: leonard.dorobat@upit.ro

**Key words:** Collembola, Araneae, new records, Romania.

One species of Araneae (*Lessertinella kulczynskii* (Lessert, 1910)) and two species of Collembola (*Deuteraphorura cebennaria* (Gisin, 1956), *Pygmarrhopalites cochlearifer* (Gisin, 1947)) are reported as new records for the Romanian fauna. Notes on the taxonomic status, morphology and distribution of the species are given.

Up till now, the genus *Lessertinella* (Araneae: Linyphiidae) was represented in the Romanian spider fauna only by the species *Lessertinella carpatica* Weiss, 1979. After our study concerning the invertebrate fauna from the Leaota Masiff, we identified a second species belonging to this genus, *Lessertinella kulczynskii* (Lessert, 1910).

In 2010, the Collembola fauna of Romania was represented by 400 species (Popa, 2010). Since then, sixteen species first time recorded for the Romanian fauna and four new described species were added to the list by various authors. The species *Isotomurus fucicolus* (Reuter, 1891) was reported as *Isotomurus palustris* var. *fucicola* by Jan Stach, 1929, from Hodod, Satu-Mare county, a locality wich belonged to Hungary that time. Up till now, there were no studies concerning the collembolan fauna from the Leaota Massif. Our study revealed two new species of Collembola for the Romanian fauna and confirms the presence of *Isotomurus fucicolus* (Reuter, 1891). Therefore, the number of collembolan species from Romania has been increased to 423 species.

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# Variations in *Platycnemis dealbata* (Insecta: Odonata) from Turkey

Ali MİROĞLU[1], Ali SALUR[2]

[1]Ordu University, Fatsa Faculty of Marine Sciences, Fatsa/Ordu, TURKEY, e-mail: alimiroglu@odu.edu.tr; alimiroglu@gmail.com
[2]Hitit University, Faculty of Arts and Sciences, Biology Dept. 19030, Çorum / Turkey, alisalur@hitit.edu.tr

**Key words:** *Platycnemis dealbata*, Turkey, taxonomy, variation.

In this study, variations in *Platycnemis dealbata* Selys in Selys & Hagen, 1850 have been revealed by examining specimens of these species in different localities. *P. dealbata* male specimens was collected and identified from Kahramanmaraş and Iğdır provinces (Turkey) in 2010, 2012 and 2015. The genus *Platycnemis* is represented by three species (*P. pennipes*, *P. kervillei* and *P. dealbata*) in Turkey (Kalkman et al., 2003; Kalkman, 2006). *P. dealbata* is found from North-west India through Kahmir and Afghanistan west to the Caucasus, southestern Turkey, Iran, Lebanon, Israel, Syria and Jordan (Steinmann, 1997; Askew, 2004). This species occur in southeast Turkey and in the coastal area in the southeast (does not occur beyond the Taurus range to the northwest of Turkey) (Kalkman, 2006; Boudot, 2009).

Males of these species are identified by their ivory body and enlarged white legs. At this time, abdomen is almost all-white, seldom S7-9 marked with black (Dijkstra & Lewington, 2006).

It has been identified that variations on *P. dealbata* male spots on caput especially frons, abdominal segments (S7-9) and pronotum and its variations have been presented by illustrations. In some specimens, body of these area are all-white while the others have black spots. Black spots show spreading to wide from narrow. Determination of these variations is very important in terms of the taxonomic.

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# Faunistic and ecological studies on aquatic and semiaquatic Heteroptera species (Insecta) of Yedigöller National Park

Ali SALUR[1], Mustafa Cemal DARILMAZ[2],
Ali MİROĞLU[3], Bayram ALTINIŞIK[4]

[1]Hitit University, Faculty of Arts and Sciences, Biology Dept. 19030, Çorum / Turkey, alisalur@hitit.edu.tr
[2]Aksaray University, Faculty of Arts and Sciences, Biology Dept., Aksaray / Turkey, mdarilmaz@gmail.com
[3]Ordu University, Fatsa Faculty of Marine Sciences, Ordu /Turkey, alimiroglu@odu.edu.tr
[4]Hitit University, Graduate School of Natural and Applied Sciences, Biology Dept. 19030, Çorum / Turkey, bayaltinisik@gmail.com

**Key words:** fauna, ecology, aquatic Heteroptera, Yedigöller National Park, Bolu, Turkey.

Aquatic and semi-aquatic Heteroptera specimens, collected from 12 different localities during fieldwork, are evaluated in this study and conducted in Yedigöller National Park in Bolu province between 2012 and 2013. Number of specimens collected from fieldwork was 290. After identification, it was determined that Heteroptera specimens belong to 10 families, 12 genera and 14 species. Among aquatic hemipters *Ranatra* (*Ranatra*) *linearis* (Linnaeus, 1758), *Micronecta* (*Micronecta*) *poweri poweri* (Douglas & Scott, 1869), *Sigara* (*Sigara*) *striata* (Linnaeus, 1758), *Ilyocoris cimicoides cimicoides* (Linnaeus, 1758), *Notonecta* (*Notonecta*) *glauca glauca* Linnaeus, 1758, *Notonecta* (*Notonecta*) *viridis* Delcourt, 1909, *Plea minutissima minutissima* Leach, 1817, *Hebrus* (*Hebrus*) *pusillus pusillus* (Fallén, 1807), *Microvelia* (*Picaultia*) *pygmaea* (Dufour, 1833), *Gerris* (*Gerris*) *argentatus* Schummel, 1832 are first record for research area and as well as Bolu province. Distribution of samples, their habitats where samples were taken and their phenologies, distribution of species in Turkey were given in the text.

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# Comparative distributional and species' group analysis of the Western Palaearctic taxa of *Trichodes* Herbst, 1792 (Coleoptera: Cleroidea: Cleridae)

Daniel Kazimir KURZELUK

Research-Development Institute for Plant Protection, Useful Organisms Laboratory, Bucharest, Ion Ionescu de la Brad Bd. Nr. 8, CP 013813, O.P. 18, sector 1, Bucharest, Romania. E-mail address: kurzelukdaniel@yahoo.com

**Key words:** Cleridae, *Trichodes*, species groups, range analysis, western Palearctic species.

46 from the 50 Western Palearctic species pertaining to the genus *Trichodes* for which mapped range data are available are analyzed. The superposition of the species' ranges led to a isospecies-line map which confirmed the hypothesis that most of its' species occur in the south-eastern part of the Turkish shore of the Mediterranean Sea. Other two agglomerations of species exist on both of the northern and the southern part of the Mediterranean basin. The northern clade is bigger and better connected with the Turkish one due to the almost complete post-glacial isolation of the southern one. Based on the investigated data, the probability that the center of origin of the Western Palearctic (and even of the Trans-Palaearctic) species is located in south-western present-day Turkey can be assumed.

Furthermore, the range correlations between the classification schemes proposed for the genus, including three or four major groups are discussed. The first one - more recent and based on the species' life history and morphology - seems to be more natural than the second one, which is an older, artificial one - based mainly the elytra pattern characters. The morphology and the distribution of the species are compared in order to establish which of the two views is more accurate.

# Kinship between *Carabus* (*Morphocarabus*) *rothi* Dejean, 1829 and *Carabus* (*Morphocarabus*) *alutensis* Săvulescu, 1972

Florin PRUNAR[1], Stephane DREANO[2], Jean BARLOY[3], Frederique BARLOY-HUBLER[2,4]

[1]Banat's University of Agricultural Sciences and Veterinary Medicine „King Michael I of Romania" from Timisoara, Aradului no. 119, Romania. E-mail: fvprunar@gmail.com.
[2]*UMR 6290, CNRS* -Institute of Genetics and Development of *Rennes* (*IGDR*), *Faculty of Medicine, University Rennes I*, 2 avenue du Prof. Léon Bernard, CS 34317, 35043 Rennes Cedex France. E-mail: stephane.dreano@univ-rennes1.fr.
[3]Agrocampus Ouest Rennes, 65 Rue de Saint-Brieuc, 35042, France. E-mail: jean.barloy@orange.fr.
[4]Plateforme Amadeus-Biosit Rennes I, 2 avenue du Prof. Léon Bernard - 35043 Rennes Cedex, France. E-mails: frederique.hubler@univ-rennes1.fr, jf.hubler@free.fr.

**Key words:** *Morphocarabus rothi rothi*, *Morphocarabus rothi alutensis*, cytoplasmic markers, phylogeny, geographical distribution

The aberration *vitiosus* Csiki (1906) of *Carabus* (*Morphocarabus) rothi* is a dominant form from Southern Transylvania (station 1 - type locality, Turnu Roșu, Sibiu county). It is also found at 80 km south, in a resort of Cozia Mountains (station 2 - Stânișoara Monastery, 709 m, Vâlcea county), where it coexists with *Carabus (Morphocarabus*) *alutensis*. This latter species is also found on both sides of the Olt River. The very limited distribution of the *Carabus (Morphocarabus) alutensis* raises the question of its origin. Although belonging to the same group, *rothi* (marker 28S5), the two species are distinguished by the endophallus shape. Certain criteria such as geographical proximity, a similar elytra sculpture suggest a phylogenetic relationship between *rothi* and *alutensis*. The use of mitochondrial markers (COI, cyt b) shows: the presence of 3 to 4 haplotypes located (N, EW Centre, S) in southern Transylvania among the populations of *Carabus* (*Morphocarabus) rothi*; a structural identity for *rothi* stations, despite the distance, assuming two independent hotbeds with the same maternal phylogeny; on the left bank of the Olt River and Cozia Mountains, *rothi* and *alutensis* are identical to the *rothi* from south and result without any doubt from a common ancestor.

On the right bank, the three studied stations have a slightly different origin. Therefore, there is a close parental relation between *alutensis* on the left bank of the river and *rothi* from south, the other geographical origins of *Carabus (Morphocarabus) rothi rothi* being distinct. In summary, based on the results of mitochondrial markers, *rothi* from south and *alutensis* have the same ancestral maternal origin.

# Data on *Eucera* Scopoli, 1770 species (Apidae: Apinae: Eucerini) from Romania

Cristina Maria CALEFARIU, Alexandra Florina LEVĂRDĂ-POPA

"Grigore Antipa" National Museum of Natural History, Şos. Kiseleff no. 1, 011341 Bucharest 2, Romania, e-mails: kitymariaban@yahoo.com; alexandra.levarda@antipa.ro

**Key words:** Eucera, Apidae, Romania

This paper makes a suggestive synthesis on the presence of *Eucera* Scopoli, 1770 species in our fauna based on data provided by scientific literature, museum collections and personal samples from 2004 to 2008. The list contains 23 species from the *Eucera* genus. Four of them, that were identified into a lower number of sites, may be considered rare: *Eucera dalmatica, Eucera helvola, Eucera nigrilabris* and *Eucera taurica*, whereas *Eucera pannonica* is mentioned for the first time in Romania.

# Taxonomic study of some Calliphoridae flies that emerged during the rearing of larvae collected on laboratory bred rat carcasses (*Rattus norvegicus* Berkenhout, 1769) (Muridae) in the Zoology Laboratory of the University of Yaounde I, Cameroon

Francis Dupont FEUGANG YOUMESSI[1,2], Elaine De CONINCK[3], Françoise HUBRECHT[4], Yves BRAET[5], Luc BOURGUIGNON[4], Champlain DJIETO-LORDON[1], Charles Félix BILONG BILONG[3]

[1]General Delegation for National Security
[2]Zoology Laboratory, University of Yaounde I, Cameroon; ffeugangyoumessi@yahoo.fr
[3]General Biology Laboratory, University of Yaounde I, Cameroon;
[4]Entomology Section, Royal Museum of Central Africa of Tervuren, Belgium;
[5]Microtraces Laboratory, National Institute of Ciminalistic and Criminology, Belgium.

**Key words:** Calliphoridae, necrophagous flies, Cameroon.

A taxonomic study of insects was conducted on the carcasses of rat (*Rattus norvegicus*, Berkenhout, 1769) (Muridae) within the campus of University of Yaounde I (Cameroon). 16 male rats weighing about 200g each were sacrificed and deposited in four cages of 1 mm mesh. On the 5$^{th}$ post mortem day, all larvae were collected, brought back to the laboratory where they were deposited in breeding boxes containing 10cm layer of sterilized ground.

1,613 adult insects emerged from the rearing under ambient laboratory temperature where 1,161 (72%) adult insects belonging to the family Calliphoridae were identified: among them there were *Chrysomya putoria* (Wiedemann, 1830) representing 40%, *Chrysomya laxifrons* (Villeneuve, 1814) representing 6%, *Chrysomya albiceps* (Wiedemann, 1819) representing 1%, *Hemipyrellia fernandica* (Macquart, 1855) representing 49% and *Hemipyrellia* sp. which represent 1%. The remaining adult insects, which represent 3%, were parasitoids.

## Research on agromyzides of Algiers: inventory and bio-ecology.

Fatma HALOUANE, Nora CHAHBAR, Naima OUKIL, O. KHALFI

Laboratoire Valorisation et conservation des ressources biologiques, Université M'hamed Bougara Boumerdes, e-mail: fatmahalouane@yahoo.fr

**Keywords: agromyzides,** leaf miner, inventory, identification, bioecology

In Algeria, the vegetable crops are prey to many insect pests, these arthropods are numerous and diversified. The leaf miner (Agromyzidae) is one of the pests whose damage to crops is rather significant. In fact, damage takes the form of both pits left by the activities of spawning and galleries in the leaves. These brands, even few are enough to take away from the quality of the plants and reduce their value. Heavy infestations with leaf miner damage the photosynthetic activity, which decreases the production of flowers, considerably impairs the quality of a culture and makes it impossible to sell. Our job is primarily to catalogue the species of agromyzides at Algerian coast, then to identify the predominant species, and finally outline their bio ecology.

# Species-specific tooth shape in haplochromine cichlids

Philippe MUNYANDAMUTSA

School of Animal Sciences and Veterinary Medicine, Department of Wildlife and Aquatic Resources Management, P.O. Box 210. Musanze, University of Rwanda.

**Key words:** tooth shape, elliptic Fourier analysis, *Haplochromis*, Lake Kivu.

As the shape of teeth is genetically determined, it is often used as a taxonomic tool to differentiate between morphologically similar species of vertebrates, including fish. The purpose of this study was to determine whether a quantification of tooth shape could allow us to identify three sympatric species of haplochromine cichlids, endemic to Lake Kivu, for which the existing identification criteria are currently only qualitative: *Haplochromis kamiranzovu*, *H. insidiae* and *H. astatodon*. Tooth shape of *Haplochromis astatodon* is considered to be very similar to that of *H. insidiae.* Some individuals of *H. kamiranzovu* have a tooth shape similar to that of *H. insidiae,* making the use of qualitative descriptors as an identification tool ambiguous. A quantitative tooth shape analysis was performed based on digitized tooth outline data with a subsequent elliptic Fourier analysis and tested for species specific differences. The analyses revealed significant differences among the three species. A more in-depth comparison showed that tooth shape is significantly different between *H. kamiranzovu* and *H. insidiae* caught across the littoral zone of Lake Kivu ($p< 0.05$) but not across the pelagic zone ($p> 0.05$). For the same species, differences were not significant between littoral and pelagic fish ($p> 0.05$), while differences were significant between south versus north populations ($p<0.05$). Additionally, the height and width of the cusps were also analysed, to explore their usefulness as species-specific descriptors to be included in an identification key. These measurements were also analysed to see whether variation could be linked to the different habitats from which the fish were sampled (littoral versus pelagic, south versus north) in Lake Kivu. Tooth sizes in *H. kamiranzovu* and *H. insidiae* were significantly different, both in height and width, as well as in their ratios, and this was true at the sexual and geographic levels ($p< 0.05$), but not at habitat level ($p> 0.05$).

# Molecular phylogeny of *Scardinius erythrophthalmus* (Pisces: Cypriniformes) inferred by cytochrome C oxidase subunit I (COI) gene analysis

Ovidiu POPESCUL[1], Mitică CIORPAC[1,2], Radu DRUICĂ[1], Lucian D. GORGAN[1]

[1]"Alexandru Ioan Cuza" University of Iași, Faculty of Biology, 20A Carol I Str., 700505, Iași, Romania, e-mail: lucian.gorgan@uaic.ro
[2]"Alexandru Ioan Cuza" University of Iași, Interdisciplinary Research Department – Field Science, Lascăr Catargi, No. 54, 700107, Iași, Romania

**Key words:** phylogeny, COI gene, *Scardinius erythrophthalmus.*

*Scardinius* is a genera of ray-finned fishes, commonly called rudds, belonging to the Cyprinidae family. Locally, the name "rudd" without any further qualifiers is also used for a certain species, particularly the common rudd (*Scardinius erythrophthalmus*). This species is a bentho-pelagic freshwater fish which is most often encountered in nutrient-rich waters with abundant vegetation. The aim of this study is to present the phylogeny of *S. erythrophthalmus* based on the molecular data obtained by analyzing the COI gene. Total DNA was extracted using phenol-chlorophorm-izoamilic alcohol (PCI) protocol. COI gene amplification was performed using the FISH F1 and FISH R1 primers. Amplicons (655 bp) were verified using gel electrophoresis and successfully sequenced using CEQ 8000 Genetic Analysis System (Beckman Coulter). Also, COI gene sequences for *S. erythrophthalmus* and for *Carassius carassius* (used as outgroup) were acquired from GenBank. The sequences were aligned using ClustalW method from MEGA 6 software. Phylogenetic trees were constructed using BEAST v1.7.5 (Bayesian Evolutionary Analysis Sampling Trees), the optimum substitution model was determined using jModelTest. Data validation consisted in estimating the convergence of posterior distributions using Tracer v1.5 and trees were visualized and edited in FigTree v1.4.0. Our results suggest that the individuals belonging to this species have a relatively low genetic diversity, the distance between them is reduced regardless of the location where the analyzed samples come from.

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# *Nessia gansi*: a second three-toed snake-skink (Scincidae) from Sri Lanka

Sudesh BATUWITA[1,2], Udeni EDIRISINGHE[1]

[1]Postgraduate Institute of Agriculture, University of Peradeniya, Sri Lanka, e-mails: pgia08-7531@pgia.ac.lk; udenied@gmail.com
[2]The Society for the Biodiversity Conservation, Kandy, Sri Lanka, e-mail: sudesh.batuwita@gmail.com

**Key words:** Sri Lanka, snake-skink, Scincidae, new species, *Nessia burtonii*.

While examining the congeners of the endemic relic Scincid genus *Nessia* Gray, we have discovered a distinct species from low land wet zone of Sri Lanka. The type/s of *Nessia burtonii* is lost and the Gray's 'brief description' (norm at that time) alone is difficult to diagnose the two species. Hence, we look over the information of the collector who had collected *Nessia* sp. from Sri Lanka and later sent to Museum of Chatham (subsequently it was described as *N. burtonii* by J. E. Gray). Our data revealed that the collector (Mr. Burton) had resided around Kandy area. Hence, we believe that the specimen/s based for the description of *N. burtonii* evidently collected from a location around Kandy. Thereby, we restricted *Nessia burtonii* to higher elevations (from ~ 500 metres) and described the lowland (up to ~200 m) inhabiting new species as *Nessia gansi*.

The new species is easily distinguished from its sister species based on the morphological and meristic data. *Nessia gansi* is distinguished from all other species of *Nessia* except *N. burtonii* by the combination of the following characters: presence of four limbs; all limbs bearing three digits; interparietal broader than frontal. The new species differs from *Nessia burtonii* by having 5 (vs. 6) supraciliaries; one (vs. two) pretemporal; two (vs. one) primary temporal; three (vs. four) infralabials; 93-105 (vs. 110-124) paravertebral scale rows; 103-114 (vs. 117-121) ventral scales; two (vs. three) subdigital lamellae under each digit; and nostrils visible (vs. not visible) when viewed ventrally.

*Nessia gansi* is recorded from Kanneliya, Rumasswala, Kottawa, Panagula, Ambalangoda and Imaduwa, while *Nessia burtonii* records (here corrected) are reported from Alagalla, Gampola, Hiniduma and Kandy.

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# Aquatic bird fauna in the protected area Preajba - Facai Lacustrine Complex (Dolj County)

Carmen Daniela BĂLESCU[1], Carmen GACHE[2]

[1]University of Craiova, Faculty of Horticulture, Department of Biology and Environmental Engineering, 13 A.I. Cuza Street, Romania, e-mail: alcor3500@yahoo.com
[2]Al. I. Cuza University from Iassy, Carol I Av., 11A, 700505, cgache@uaic.ro

**Key words:** aquatic bird fauna, phenology, population, protection.

The authors present results of field ornithological researches done starting from March 2014 till September 2015 in the natural protected area Preajba – Facai Lacustrine Complex (code 2394). There are small reservoirs created on the Preajba River, covering about 28 hectares, with reed cords on the shores (large about 1 – 3 m) and compact reed, especially in the tail of reservoirs' area. We followed the aquatic bird fauna's diversity and its seasonal dynamics, their populations' size and the anthropogenic impact on the protected species in this area.

We observed 32 bird species related to the aquatic habitats (aquatic birds, herons, waders, but also reed passerines and *Circus aeruginosus*), 13 species present in the Annexe 1 of Birds' Directive. There were identified 16 breeding species, all presenting small effectives; between them we notice the presence of *Aythya nyroca* – globally threatened species and of some species included in the Romanian Red Book of Vertebrates (*Nycticorax nycticorax*, *Himantopus himantopus* and *Egretta garzetta*, the last like probably breeding species in the area). During the passage, we met other protected species like *Microcarbo pygmeus*, *Ardeola ralloides*, *Ardea purpurea* or *Ardea alba* and we recorded the biggest effectives of birds in the area (flocks about tens to hundreds individuals).

The anthropogenic impact is great due the vicinity of village. The cultivated lands (maize, sunflower and wheat), but also the rural households are going till the shores of reservoirs. Numerous fishermen are present around the water neighbourhood all the time and large effectives of poultry are present on the reservoirs, too. The presence of wild dogs represents a huge risk for the breeding species in the humid meadows from the area. The protected area has not caretaker and not management plan, too.

# Changes of the nests' settlement of the White stork (*Ciconia ciconia* L.) in Republic of Moldova

Larisa BOGDEA, Nicolai ZUBCOV, Vasili CRUDU,
Andrei MUNTEANU, Natalia SOCHIRCĂ

Institute of Zoology of Academy of Sciences of Moldova, str. Academiei, 1, Chişinău, 2028, e-mail: larus421@gmail.com

**Key words:** White Stork, *Ciconia ciconia*, nest site, distribution, power poles.

The specificity of the landscapes, human activity and climatic conditions from republic of Moldova are those that determine the changes that take place in vertebrate fauna, especially birds. These factors have a certain effect on the number and distribution of some species, including the White Stork (*Ciconia ciconia* L.). The population census of White Stork in Republic of Moldova in the last decades shows that the number and the distribution of this species on the territory of the country, as well in the neighbouring regions, vary from year to year. After analysing the White Stork population census' results from the last decades, it was established that there is not just the fact of territorial redistribution of the nests region, but also the location of the nests. During the 1950's, White Stork nests were placed mostly on the roofs of the houses. From 453 nests that were registered, 87.8% were located on reed roofs, 4.6% on brick roofs and 7.5% on trees. In the following decades, in Moldova's localities, reed roofs were replaced with tile and slate. Beginning with the 1970's, significant changes regarding the nests' settlement of the White Stork were registered. The number of nests on buildings has gradually decreased. A quick and linear increase of the number of the nests located on the power poles was recorded. In 1974 there were registered – 5.2%, in 1984 – 24.1%, 1994 – 44.3%, 2015 – 82.0%. This trend continues until nowadays. This phenomenon is probably caused by the fact that building the nests on the tile's roofs for Storks might be uncomfortable; also, some owners seeing this fact negatively. At the same time, this can also be explained as due to the increasing number of the power poles along the roads in the villages. On the other hand, the placing of the nests on the power poles presents for the birds a wider view of the habitat and access to it. The reduction in the number of the nests on houses is mostly due to replacing old reed roofs with tile, and also because of the architectural changes to them, that made them almost unfeasible for placing the nests. The White Stork's population from Moldova were affected negatively by the climate aridity recorded during the last decades. These weather conditions led to the reduction of wetlands that caused the decline of amphibians and other species, which are the main source of food for the white stork. Therefore quite a lot of nests from some villages remain unoccupied, while in other villages new ones appear. For this reason, there is a redistribution of nesting places as a correlation to the remaining wetlands.

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# A new breeding site for the Oystercatcher (*Haematopus ostralegus*) in the Special Protection Area ROSPA0071 Lower Siret Meadow (Eastern România)

Matei-Ionuț DRAGOMIR[1,2], Gabriel CHIȘAMERA[3], Costică ADAM[3], Alina DRAGOMIR[1]

[1]Association for Biological Diversity Conservation, Str. Ion Creangă no. 12, 620083, Focşani, Romania, e-mail: matei.dragomir@acdb.ro
[2]University of Bucharest, Faculty of Biology, Str. Splaiul Independeței no. 91-95, Bucharest, 5, Romania
[3]"Grigore Antipa" National Museum of Natural History, 1 Kiseleff Blvd., 011341 Bucharest 1, Romania

**Key words:** oystercatcher, breeding, Lower Siret Meadow, Romania

The oystercatcher (*Haematopus ostralegus*) is known as breeding in Romania in the coastal region of the Black Sea (Radu, 1997) and as a sporadic breeding species on sand and gravel shores of some large rivers and lakes (Munteanu, 2012), but no data is available to confirm breeding pairs on rivers or lakes in Romania. First breeding pair on Siret River was found accidentally in 2013. In 2015, a complete inventory was made from the northern region of the Lower Siret Meadow and the confluence of Siret with Putna River from where the substrate changes and there are no isles or gravel banks downstream. Six nests were found in this inventory, three of them had four eggs inside, two nests had three eggs and one nest had only one egg, but there was evidence of predation. Four nests were on gravel beaches and two were on gravel banks, the nest found in 2013 was also on a gravel bank. Other than the six oystercatcher pairs with found nests, there were other 2 pairs, but the nests were not discovered. Physical characteristics such as distance from water, vegetation cover, vegetation height, kind of substrate, bank/isle surface and other parameters were compared between nest sites.

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# Migration strategies of Common buzzard (*Buteo buteo* Linnaeus, 1758) in Dobrudja, Romania

Cătălin-Răzvan STANCIU[1,2], Răzvan ZAHARIA[2]

[1]Faculty of Biology, University of Bucharest, 91-95 Splaiul Independenţei, 050095 Bucharest 5, Romania, e-mail: stanciucatalinbio@gmail.com
[2]"Oceanic-Club" Society of Oceanographical Exploration and Protection of the Marine Environment, 41 Decebal Str., Constanța, Romania, e-mail: razvan.zaharia@oceanic.ro

**Key words:** common buzzard, steppe buzzard, migration, raptors, conservation strategie, green energy

The Common Buzzard is the most common migratory bird of prey during spring and autumn migration in the eastern part of Romania (***, 2007). Two subspecies were identified during the three-year survey (2012-2015), nominate *Buteo buteo buteo* (Linnaeus, 1758) and *Buteo buteo vulpinus* (Gloger, 1833) the steppe buzzard, but also intergrade specimens (*buteo/vulpinus*).

Vantage points were selected for observations in various parts of Dobrudja, covering the whole region from east to west. Species, number of individuals and height was recorded as well as physical parameters such as wind speed, wind direction, type of flight.

Of more than 2000 individuals observed more than 75% were steppe buzzard (*Buteo buteo vulpinus*). This subspecies is wholly migratory, flying from breeding quarters (Eastern Europe and Siberia) to winter quarters in Ethiopian Africa (Cramp et al., 1987).

The peek passage period in autumn migration was reached between the 26$^{th}$ of September to the 6$^{th}$ of October, while for the spring migration peek passage is uncertain (most probable late March). Time periods were set for each day in order to investigate pattern migration, as it follows: 7:00-10:00; 10:01-13:00; 13:01-16:00; 16:01-19:00. A more significant activity was recorded in the second time period.

A better understanding of migratory patterns and strategies is necessary when raptors conservation strategies are made, especially in the context of development of green energy technology, such as wind turbines, which are reaching higher and higher altitudes, and greater numbers from year to year.

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# Bats (Mammalia: Chiroptera) of Racoviţa and surroundings (Făgăraş Depression, Transylvania)

Georgiana MĂRGINEAN

Faculty of Biology, University of Bucharest, 91-95 Splaiul Independenţei, Bucharest 5; Făgăraş Mountains Association, 1687 Octavian Goga St., Răşinari, Sibiu, Romania. E-mail: georgiana.marginean@gmail.com

**Key words:** bat fauna distribution, Făgăraş Depression, Romania.

The aim of the study was to assess the geographical and distribution of bat species, on the village territory and surroundings. Surveys were performed in different groups of habitats, between years 2007-2014. Recording points were taken in half-open areas (forest edge, rivers, lake settlements) in closed habitats (forests, orchards) and open habitats (meadows, grasslands, arable lands). Walked and car transects have variable lengths (3-8 km/night) and were conducted on the streets and forest roads of Racoviţa village and its administrative territory. An overview regarding the relative abundance (dominance) during the seven years of monitoring shows that of the 18 identified bat species in the study area, we have the following distribution: 2 eudominant species: *Nyctalus noctula, Pipistrellus pipistrellus*; 4 dominant species *Myotis daubentonii, Barbastella barbastellus, Eptesicus serotinus, Pipistrellus pygmaeus*; 9 subdominant species *Myotis bechsteinii, Nyctalus leisleri, Vespertilio murinus, Eptesicus nilsonii, Pipistrellus kuhlii, Myotis myotis/oxygnathus, Myotis brandtii, Myotis mystacinus, Rhinolophus hipposideros*; 2 recedent species: *Myotis schreibersii, Pipistrellus nathusii*; 1 subrecedent species: *Myotis alcathoe*. Fourteen of the eighteen identified bat species were detected feeding over water surfaces. One important birth colony is located in the Mârşa former military base (situated between Racoviţa and Avrig administrative territories). There is no other known roost in the area making these bat species the local hot spot. In Racoviţa's administrative territory region we observed 5 commuting routes, one spring migration route, 7 feeding areas. Regarding the status of habitats in the northern side of the administrative territory of Racovita, we can say that it is favorable, not logging out of control. But the roosts and feeding areas from the former military base may change in the future due to various proposed projects in durable development strategy of Avrig City.

# New data regarding bat species from caves in Bucegi National Park, Romania

Oana Mirela CHACHULA[1], Lotus Elena MEŞTER[2],
Cezar Georgian SPĂTARU[3], Georgiana MĂRGINEAN[4]

[1]National Museum of Romanian History, Calea Victoriei Str, no 12, Bucharest Romania, e-mail: oana_chachula@yahoo.com
[2] Department of Biology, Bucharest University, 95-97 Splaiul Independenţei, Bucharest 5, Romania
[3] Game Biology, Forest Research and Management Institute, Braşov Romania,e-mail: sptrcezar@yahoo.com
[4] Department of Biology, Bucharest University, 95-97 Splaiul Independenţei, Bucharest 5, Romania,
e-mail: georgiana.marginean@gmail.com,

**Key words:** cave, Rătei, *Myotis emarginatus,* hibernation

We present results of one monitoring programme on the bats' species in caves from the Bucegi National Park, Romania, beginning from 2002. First, we paid our efforts to identify all the existing subterranean shelters. So, we located 38 caves inside the park's territory and another 6 caves near the limit of it, but important from chiropterological view: Peştera Urşilor Cave from Sătic village, The Tunnel from Sătic village, Uluce Cave, Valea Cetăţii Cave, Peştera Ursului Cave from Pietricica Mount and Peştera cu Lilieci Cave from Peştera village (Piatra Craiului National Park). The caves from this mountain massive are not big, excepting the Răteiului Cave (7724 m in length) and Ialomiţei Cave (1128 m in length).

During our study, we counted the bats during hibernation time inside the caves: Răteiului Cave, Pustnicului Cave, Peştera Mică Cave, Urşilor Cave, Bogdan' Cave, Tunelul Apelor Cave, part of them being first time included in this kind of bats' research programs. Thus we identified 7 bats species including *Myotis myotis/blythii*, *Myotis emarginatus*, *Myotis nattereri*, *Myotis daubentonii*, *Rhinolophus ferrumequinum* and *Rhinolophus hipposideros*. Among them, *M. emarginatus* is a rare bat species, but we recorded 10 specimens during hibernation time in the Răteiului Cave (2003). We noticed also the presence of *M. nattereri* and *M. daubentonii* in the Bogdan' Cave during the breeding time, in 2014. The last two species were recorded for the first time in the territory of Bucegi National Park.

# The behavior of bats in urban areas of Bucharest, Romania

Andreea-Diana BOSTAN[1,3], Oana Mirela CHACHULA[2],
Dragoş Ştefan MĂNTOIU[3]

[1]Faculty of Ecology and Environmental Protection, Ecological University of Bucharest, Vasile Milea Bd., no. 1G, S6, Bucharest, e-mail: andreea.diaana@yahoo.com
[2]National Museum of Romanian History, Calea Victoriei Str., no. 12, 030026, Bucharest, Romania, e-mail: oana_chachula@yahoo.com
[3] Wilderness Research and Conservation – Bucharest, dragos.mantoiu@gmail.com

**Key words:** chiroptera, urban areas, ultrasound monitoring

Bats have adapted to the man made changes which have radically transformed the landscape during the last centuries. Tree or crevice dwelling bats have been observed to prosper within urban sites, using them both as hibernation and maternity sites. This paper aims to identify the bat fauna within Bucharest, Romania, taking into account multiple methods of observation which were conducted within a one year study period. Ultrasound monitoring of bat calls was performed in several grid areas within the city, using an Anabat SD2 detector and choosing several types of habitat: residential buildings close to green areas, parks with lakes and natural areas, such as the Văcăreşti Natural Park and neighborhoods which contain mostly historical buildings. Data was also collected from the Luana Wild Animal Rescue Center, which had multiple interventions for bats in need within the city, and from door to door surveys which aimed to identify colonies within the study area.

Results show that *Nyctalus noctula* is the most abundant species, being found in most cases within the study area. Other species were identified, such as: *Pipistrellus pipistrellus*, *P. kuhlii*, *Vesperitlio murinus* and *Eptesicus serotinus*. Colonies were found in cracks within residential buildings, building roosts and hollows within old trees. Isolated individuals were found within building cracks.

Marked bats which were rehabilitated and released within the city, in bat houses, have been found both in the winter and summer periods, indicating that some species which show a migratory behavior, such as *Nyctalus noctula*, have adopted a sedentary lifestyle.

The study aims to offer a set of conservation measures that can be used to protect bat populations within urban areas in Romania.

# Analyses on cranial parameters and mortality case of *Nyctalus noctula* colony (Chiroptera: Vespertilionidae) in a cave from Grădiştea Muncelului-Ciclovina Natural Park, Romania

Oana Mirela CHACHULA[1], Georgiana MĂRGINEAN[2], Andreea-Diana BOSTAN[3], Mihaela SOPINCEAN[4], Ioan COROIU[5]

[1]National Museum of Romanian History, Calea Victoriei Str, no 12, Bucharest, Romania,e-mail: oana_chachula@yahoo.com
[2]Department of Biology, Bucharest University, 95-97 Splaiul Independenţei, Bucharest 5, Romania,
e-mail: georgiana.marginean@gmail.com
[3] Faculty of Ecology and Environmental Protection, Ecological University of Bucharest, Vasile Milea Bd., no. 1G, S6, Bucharest, e-mail: andreea.diaana@yahoo.com
[4]Clubul Sporturilor Montane Hunedoara, Sarmisegetuza Str, no 36, Hunedoara, Romania, e-mail: sopincean_m@yahoo.com
[5]Faculty of Biology and Geology, Babes-Bolyai University, Clinicilor Str, no 5-7, Cluj-Napoca, Ronania, e-mail:icoroiu@hasdeu.ubbcluj.ro

**Key words:** cave, *Nyctalus noctula*, *Nyctalus leisleri*, ossuary, mortality

The present study in Ciclovina cu Apă Cave started in 2005 and is related to one mortality case found in a fossil gallery from the cave. It is part of Ponorâci-Ciclovina karstic system, Grădiştea Muncelului-Ciclovina Natural Reserve, Hunedoara County. This is a natural reserve about 1.5 ha while the cave has 6713 m in length and two entrances, representing the resurgence of Ponorâci River with an opening point at one stone base by 90 m high. We identified a colony formed by *Nyctalus noctula* species using the bat-detectors in its cracks all over the year.

Colonies formed by species such as *Rhinolophus ferrumequinum, Rhinolophus hipposideros, Myotis myotis/blythii, Myotis nattereri* and *Miniopterus schreibersii* are present here during hibernation. The first record of *Nyctalus noctula* species was done in '60 by Margareta Dumitrescu.

For 10 years, we have been colecting fresh bodies (especially in summer), but we also found numerous anatomical skeletons or skulls. We were surprised by this ossuary, discovered in one single spot of the cave, that could not be evaluated as it be very old. Until now, we have analyzed 190 skulls. Through measurements, we identified that the species *N. noctula* represents about 35% of the colony, *Nyctalus leisleri* represents about 57%, *M. myotis* - 5.2 %, while the rest are *M. blythii*, *Barbastella barbastellus* and *Myotis daubentonii*, about 0.5% each. The species *N. leisleri* and *B. barbastellus* are reported for the first time in this cave.

# Archaeozoological data from the 8th century archaeological diggings carried out in Iernut (Mureș county)

Xenia POP[1], Alexandru GUDEA[1], Aurel DAMIAN[1]

[1]University of Agricultural Sciences and Veterinary Medicine, Cluj-Napoca, Calea Mănăștur, no. 3-5, 400372, Romania, e-mail: xenia.pop@usamvcluj.ro

**Key words:** archaeozoology, osteometrical data, 8th century, animal bones, Iernut, archaeological excavation.

The present study attempts the presentation of the results of the investigations carried out on archaeozoological samples harvested from the archaeological diggings in Iernut (Mureș county).

The archaeofaunal sample comprises 55 bone pieces and belongs to the migration period. Most of the pieces originate from domestic species, the most representative one being the large ruminants (bovines) with an estimated minimum number of individuals (MNI) of 4. The osteometric data show the existence of a castrated individual and a female, both with ages over 2,5 years. The recalculated hight is 1145 mm (Boessneck) for the castrated individual and 1135 mm (Boessneck) for the female individual.

In the studied sample, capriovid and domestic swine bones were identified, as well. Based on the dental attrition and wear and long-bone ossification data, one can conclude that for capriovids, most of the slaughtered individuals were young, subadults, while suids were slaughtered around the 1.5 years.

The realized archaeozoological study carried on bones originating from Iernut reveals the fact that animal breeding played an important role in the economy of the community. The identified species were kept both for alimentary but also for utilitarian purposes. The revealed information based on osteometric data shows that bovines were relatively small in height.

# Chromosome studies of some Georgian terrestrial molluscs (Mollusca: Gastropoda: Pulmonata)

Nana BAKHTADZE[1], Nino CHAKVETADZE[1], Levan MUMLADZE[2], George BAKHTADZE[1], Edisher TSKHADAIA[1]

[1]Institute of Zoology, Ilia State University, Kakutsa Cholokashvili Ave no. 3/5., 0162 Tbilisi, Georgia, e-mails: nanabakhtadze@yahoo.com; nana.bakhtadze@ iliauni.edu.ge
[2]Institute of Ecology, Ilia State University, Kakutsa Cholokashvili Ave no. 3/5., 0162 Tbilisi, Georgia, e-mail: Levan.mumladze@iliauni.edu.ge

**Key words:** chromosome number, terrestrial molluscs, Georgia.

The results of the chromosome studies of the terrestrial molluscs of Georgia (the Caucasus region) are summarized.

The specimens of the land snails and slugs for investigations were collected by the authors in the spring-autumn periods of 2013-2015. The samples from different regions of Georgia (Autonomous Republic of Adjara, Imereti, Samtskhe-Javakheti, Kakheti and Tbilisi city) were used. Chromosome preparations were made following the air-drying and squash methods for molluscan species described by different authors. The chromosome numbers (somatic and basic) for some species belonging to three families: Helicidae Rafinesque, 1815, Hygromiidae Tryon, 1866 and Limacidae Lamarck, 1801 were established.

Two different values of basic chromosome number n=26 (*Caucasotachea calligera* Dubois de Montpéreux, 1840) and n=27 (*Helix buchii* Dubois de Montpéreux, 1839 and *H. lucorum* Linnaeus, 1758) were registered in family Helicidae. The number n=23 and n=26 were recorded for hygromiid snails *Circassina frutis* (L. Pfeiffer, 1859) and *Xeropicta derbentina* (Krynicki, 1836), respectively. The latter was studied for the first time. Approximately 2n=60-62 somatic chromosome number was found in limacid slug *Gigantomilax lederi* (O. Boettger, 1883).

Chromosome numbers registered in the investigated species of Georgian land snails and slugs of families Helicidae, Hygromiidae and Limacidae are within the ranges of chromosome numbers described for these families. Presumably chromosome data may be useful for future karyosystematic investigations of the terrestrial molluscs of Georgia and also their systematics.

# New data regarding the paleontological research from Muierilor Cave (Romania)

Ionuţ-Cornel MIREA[1], Marius ROBU[2], Alexandru PETCULESCU[1], Marius KENESZ[3], Silviu CONSTANTIN[1], Vlad CODREA[4]

[1] Emil Racovită" Institute of Speleology, Center for Geochronology and Paleoclimate, str. Frumoasă 31, 010986 Bucharest, Romania. E-mail: ionut.mirea@iser.ro
[2] "Emil Racoviţă" Institute of Speleology, Romanian Academy, Calea 13 Septembrie, 13, 050711, Bucharest, Romania.
[3] "Emil Racovită" Institute of Speleology, Cluj Branch, Str. Clinicilor, nr. 5, Cod 400006, Cluj Napoca, Romania.
[4] Department of Geology, Faculty of Biology - Geology, Babes- Bolyai University,1, Kogălniceanu Street, 400084 Cluj-Napoca, Romania

**Key words:** taphonomic processes, spatial orientation, $^{14}C$ AMS dating, Muierilor Cave, Upper Pleistocene.

New data concerning the bone assemblage from Muierilor Cave (Southern Carpathians) were revealed during a new palaeontological excavation (ca. 9 $m^2$) in the Scientific Reserve (= *Bears' Passage*). The accumulation of fossil remains within the excavation is represented mostly by scattered skeletal fragments belonging to cave bears (*Ursus spelaeus* Rosemüller & Heinroth 1794), cave lions (*Panthera spelaea* Goldfuss 1810), cave hyena (*Crocuta crocuta spelaea* Goldfuss, 1823), grey wolf (*Canis lupus*, Linnaeus 1758) and scarce elements of herbivores and micromammals. To better understand the depositional nature of the fossil bone assemblage, spatial orientation analyses were performed on the long bones (humeri, ulnae, tibiae and femora) extracted from the digging trench. The fossil bones were recorded, photographed and surveyed with respect to the excavation grid and a 10 × 10 cm subgrid. The orientation of 250 long bones was measured to test for the inferred fluvial transport. The bone surveying was done using high resolution pictures and measuring the azimuth with a compass. AMS radiocarbon dating was performed on 12 fossil bone samples (10 samples belonging to *U. spelaeus* and 2 samples to *C. lupus*) in order to establish a chronological framework of the palaeosurface. The results of the spatial analyses indicate a main polarity for the analyzed bones on *NW-SE,* suggesting a fluvial transport. The AMS $^{14}C$ ages (between *ca*. 35 - 48 kyrs BP; Marine Isotope Stage 3), indicate a similar time span with other several cave sites from Romania such as Urșilor, Oase and Cioclovina.

Results of this preliminary research indicate fluvial transport (reworking processes) of the fossil bones. The reworking appears to be linked to a climate event that generated successive flooding of cave passages by 35 ka.

# Freshwater ichthyofauna of the Czatkowice 2 assemblage in the light of old and new findings

Piotr SKRZYCKI[1], Mariusz PASZKOWSKI[2], Roksana SKRZYCKA[3], Bronisław W. WOŁOSZYN[4]

1. Institute of Paleobiology, Polish Academy of Sciences, Twarda 51/55, 00-818 Warsaw, Poland, e-mail: pskrzycki@twarda.pan.pl
2. Institute of Geological Sciences, Polish Academy of Sciences, Research Centre in Krakow, Senacka 1, 31-002 Krakow, Poland, ndpaszko@gmail.com
3. Chiropterological Information Center, Institute of Systematics and Evolution of Animals, Polish Academy of Sciences, Slawkowska 17, 31-016 Krakow, Poland, e-mail: roksana.socha@gmail.com
4. Chiropterological Information Center, Institute of Systematics and Evolution of Animals, Polish Academy of Sciences, Sla

**Key words:** Mesozoic, diponans, actinopterygians, karst.

The Czatkowice quarry (Krzeszowice, nearby Cracow, Southern Poland) yield extensive sediments of two phases of karstification. Karst formations contain bone breccia deposits developed in limestone bedrocks of Lower Carboniferous age (Debnik Massif). The first phase took place between the Late Carboniferous and the late Early Triassic. The vertebrate assemblage (Czatkowice 1) from this phase dated early Late Olenekian is fairly known. Here, we present new findings from the second phase strata (Czatkowice 2).

Late Triassic/Early Jurassic Czatkowice 2 fossil karst forms represent last Pre-Callovian phase of Carboniferous limestone bedrock multiple karstification on Paleozoic carbonate Debnik Massif. Tectonics is considered as paleo-geomorphological agent here. Due to uplifting of eastern, hanging wall of meridional Krzeszowka/Eliaszowka fault, post-Triassic erosion removed whole Triassic sedimentary cover east of Eliaszowka Valley. Stripped out and exposed steeply oriented Lower Carboniferous carbonate massif became a karstified plateau (like Czatkowice 1 phase), raised again over adjacent fluviolacustrine alluvial plains. Czatkowice 2 are considered remnants of sinkholes system, filled with green-grey siliciclastic-carbonate internal deposits, secondary dolomitized bone accumulations may result from mass mortality after severe, long drought episodes, usually following by flood erosion of dried out bottom sediments of ephemeral, fish populated ponds, inside karst valleys.

In 1979-82 discovery of Czatkowice 2 actinopterygian bones and scales of three different morphotypes, *Ptychoceratodus* sp. (dipnoan) tooth plates and remains of an amphibian were noted. Except from dipnoan tooth plates this material is probably lost. Due to the activity of the quarry described karst deposits were destroyed. In 2005 new karst forms, probably correlated with original Czatkowice 2 were uncovered. Numerous vertebrate remains are present in the new material. Those are described and compared here. Czatkowice fauna is also compared here with other close fish communities of comparable age from the Late Triassic strata of Silesia (Poland).

# A giant shark in shallow waters: *Carcharodon cf. megalodon* (Agassiz, 1835) from Lăpugiu de Sus (Hunedoara County), Romania. Preliminary notes

Nicolae TRIF[1], Rodica CIOBANU[2]

[1] Independent researcher, 9 Poiana Str., Sibiu, Romania, e-mail: nicolae.trif@gmail.com
[2] Brukenthal National Museum, Natural History Museum,1 Cetăţii Str., 550166 Sibiu, Romania, e-mail: rodi_ciobanu2005@yahoo.com

**Key words:** Middle Miocene, Badenian, Central Paratethys, *Carcharodon megalodon,* Lăpugiu de Sus.

A very famous locality for its mollusk fauna, the area near Lăpugiu de Sus (Hunedoara County, Romania) yields rich Miocene fossiliferous deposits. Located in the Mureş River corridor the Miocene deposits are structured in a depositional unconformity on older rocks and into a variety of lithological formations. The deposits are part of the filling of the Făget Basin, a Neogene extension of the Pannonian Basin (Mutihac, 1990). Dated as early Badenian (Chira et al., 2001) these formations are holding a very well preserved marine fauna.

In this paperwork we present one isolated tooth collected from the Coşului creek, a small, left side tooth, tributary of the Lăpugiului Valley, that runs through the Lăpugiu de Sus village. The tooth, recently collected, was donated to the Natural History Museum from Sibiu and now it is part of the paleontological collection.

In determining the species of this tooth we think a few options are to be taken into consideration. Having in mind the general size, shape, but also the age of the deposits and consulting the literature, it seems that *Carcharodon megalodon* and *Carcharodon chubuttensis* are the species the more likely to be considered. Stratigraphic range of these both species seem to come in contact in the Miocene, *Carcharodon chubutensis* ranges from the early to the middle Miocene, whereas *Carcharodon megalodon* from the middle Miocene to the Pleistocene, that is 17 to 2 Ma. (Pimiento et al., 2010, 2013). This would place our specimen more or less at the end of one species range and at the beginning of the other one.

Considering the general morphology of the tooth, the chronologic framing and the faunal composition of the close areas from the Parathetys sea we may conclude that the described tooth can be assigned to the *megalodon* species, but using the "*cf*" mention due to the proximity of the *chubutensis* species on the geological scale.

We would like to remark that it is the first time that this genus and species are mentioned in this outcrop and for this geological age. The genus *Carcharodon/ Carcharocles* was reported in the Eocene deposits from Turnu Roşu (Sibiu county) and from Cluj Napoca.

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# Water management in Harman Marsh using a Mike She model

Şerban Octavian DAVIDESCU[1], Mariana CHEVEREŞEAN[2], Nicu Constantin TUDOSE[1], Mihai STANCU[2], Cezar UNGUREAN[1], Adriana DAVIDESCU[1], Adrian MIRIA[3], Georgeta IONESCU[1,3], Ioana NEGREA[3,4], Alexandru GRIDAN[3,4]

[1]"National Institute for Research and Development in Forestry, 13 Cloşca Str., 500040 Braşov Romania, e-mails: titi@icaswildlife.ro
[2]Universitatea tehnică de construcţii Bucuresti Romania
[3]Carpati Foundation
[4]Transilvania University of Brasov, Silviculture and Forest Engineering

**Key words:** groundwater flow, marsh, hydrological model

Harman Marsh is a small wetland (5.34 ha), included in a larger Natura 2000 site also comprising Lempes Hill. The site is located 18 km north from Brasov City inside its metropolitan area. Geomorphologically, the marsh is located in the center of the Brasov Depression (N45° 43'-E25° 39'), the largest intermountain depression of the South - Eastern Carpathians.

We sought answer to two questions: (1) which is the direction and speed of groundwater flow?, (2) which is the depth of groundwater related to topographical surface? To answer these questions, we drilled 12 shallow wells (100 -252 cm) where the water level was periodically measured (summer - fall 2013).

For this period maximum rainfall recoded was 50 mm, whilst daily potential evapotranspiration varied between 2.26 and 5.21 mm and average daily temperature varied between 12 to 26 C°. Flow direction is from SW to NE and is influenced by the hydrological network from Harman marsh. Average speed of groundwater flow in marsh area is estimated at 5.6 cm/hour and it shows a high variability thus: minimum speed is less than 1 cm/hour in the western part of marsh, and the maximum assess speed is 75 cm/hour in the eastern part to the marsh. The amplitude of groundwater level varied between 11 cm from 56 cm. Groundwater flow very low and human activities near the marsh (especially in the North West part) influences water quantity and quality

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# Changes in the Romanian freshwater molluscan fauna and communties' structure during the last two decades

Ioan SÎRBU, Ana Maria BENEDEK

Lucian Blaga University of Sibiu, Faculty of Sciences, Department of Environmental Sciences and Physics, Dr. I. Raţiu St.no. 5-7, RO-550012 Sibiu, Romania, e-mail: meosirbu@yahoo.com, benedek_ana@yahoo.com..

**Key words:** gastropods, bivalves, alien invasive species, extinction, human impact

Significant structural changes within fauna, communities' structure, and dispersal of freshwater gastropods and bivalves from Romania were traced during the last 20 years. Some changes are linked to the reduction or even disappearance of industrial pollution in the early 90's, caused by the collapse of the former centrally planned economies. Accordingly, along several river sectors, we witnessed the reappearance of formerly vanished species. A case-study concerning the lower Mureş River is shown, where some species of community interest (like *Unio crassus*) or strictly protected by Romanian legislation (like *Pseudanodonta complanata*) have recolonized the formerly polluted habitats, establishing stable populations at present. In addition, reduction in the distribution and diversity of molluscan communities, due to other categories of human impact as well as of invading species, are also noticed. For instance, the causes of decline and the eventual extinction in wild of the local thermal endemic gastropod species *Melanopsis parreyssii* are analysed. Range expansion of some alien invasive species and the related impact on the molluscs communities are depicted. We highlight the first record of the alien species *Melanoides tuberculata* in the Hidişel and Peţea rivulets, in Bihor county, during the month of August 2015. There, it lives together with *Planorbella anceps anceps*, also an alien species, first found in the Peţea thermal lake (published by Glöer and Sîrbu in 2006). *Sinanodomta woodiana* was recently found in the central part of the country, namely in the middle Olt River Basin, and new sites of the invasive *Corbicula fluminea* were recorded in the western part of Romania. Its presence in the lower Crişul Negru River is linked to the decline of the native Unionidae communities. Changes in the communities' structure related to natural causes (draught, siltation, increasing temperatures etc.) are of increasing magnitude during the last years, affecting mostly lowland wetlands.

# Comparative degree of seed hardness to pest damage in stores

Seyed Hamidreza FORGHANI, Aidin HAMIDI, Javad SHATERIAN

Seed & Plant Certification & Registration Institute, Karaj, P.O.B.:31535-1516, Iran. Forghani51@gmail.com

**Key words:** Wheat, Pest store, Seed Leaching.

Different types of seeds have various resistant to consumption of pest stores. We surveyed some aspects of seed physiological characteristic relation to pest damage. Thus, some wheat cultivars were selected for this experiment under lab circumstances (25 ± 1) ºC, (L:D),(16:8), RH% (45 ± 5)). Test tubes consisted of ten seeds with 10 $^{cc}$ deionized water and considered for sound and damaged (by pest) seed treatments separately. Then, leakage of seed examined by electrical conductivity (EC) and osmotic potential ($y_p$) after three days later (Forghani et al., 2011c). In present work Bam and Pishtaz cultivars had the most amount in damaged seeds ($EC_{Bam}$=0.893, $EC_{Pishtaz}$= 0.755; $y_{pBam}$=-0.133, $y_{pPishtaz}$=-0.137) and also, in sound seeds ($EC_{Bam}$=0.340, $EC_{Pishtaz}$=0.346; $y_{pBam}$=-0.089, $y_{pPishtaz}$=-0.087) whereas, Milan and Zagros showed the least numbers in damaged ($EC_{Milan}$=0.258, $EC_{Zagros}$=0.250; $y_{pMilan}$=-0.365, $y_{pZagros}$=-0.428) and in sound seeds ($EC_{Milan}$=0.056, $EC_{Zagros}$=0.071; $y_{pMilan}$=-0.32, $y_{pZagros}$=-0.39) in the same factors chronologically (Forghani et al. 2011a). Therefore, Milan and Zagros might be considered more resistant against feeding of the pests. These findings can be useful for management in stores.

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# Measuring leaf area damaged by *Bryobia rubrioculus* on sweet cherry and sour cheery leaves with "Compu Eye, Leaf & Symptom Area" software

Nazila HONARPARVAR[1], Mohammad KHANJANI[2], Naser BOUZARI[3]

[1,2]Department of Plant protection Bu Ali-Sina University, Hamedan, Iran, e-mail: Honarparvarnazila@yahoo.com, mkhanjani@gmail.com
Seed and Plant Improvement Institute, Karaj, Iran, e-mail: bouzari1111@yahoo.com

**Key words:** *Bryobia rubrioculus*, area, leaf, software, symptom.

One way of assessing the impact of pathogens or herbivores on host plants is to measure the area of leaf damaged. Common methods to estimate the area damaged include counting the number of squares with damage on a grid overlayed on the leaf surface (Simms, 1993) or visually estimating leaf area damaged by comparison with pictures of leaves with known amounts of damage (Schaffer et al., 1986; Kogan & Turnipseed, 1980). These techniques are simple to implement; however, they are not accurate.

In this study we used "Compu Eye, Leaf & Symptom Area" software to make this process easier and more accurate and measure leaf area damaged caused by a phytophagous mite, *Bryobia rubrioculus*. The Brown mite, *Bryobia rubrioculus* Scheuten (Acari: Tetranychidae), is an injurious pest of fruit trees in the western region of Iran. Feeding by mites induces brown spots on leaf surface. Injured leaves were scanned on a common flat bed color scanner to obtain any symptom on the leaf. A standard green shape with a known area of 400 $mm^2$ was used to evaluate the accuracy of the software. In order to evaluate leaf area damaged, leaves with symptoms of 30 adult mite injury were collected from ten cultivars of sweet cherry (KB9, KB21, KB10, KB25, Sabima, Hamedan, Zarde 90, Siahe Mashhad, Lambert, Haj Yosefi) and five cultivars of sour cherry (BT5148, BN5150, BT5124, BO5187, BT5154). The image analysis of the standard shape was repeated, for each image, using a series of measurement units, 0.1, 0.2, 0.4, 0.6, 0.8 and 1.0 $mm^2$. The customized detection averages revealed 40.67, 38.78, 38.67, 37.75, 37.65, 35.89, 34.38, 32.49, 31.95, 29.15, 28.48, 20.84, 15.04, 12.33 and 7.52% symptom area averages for KB9, KB21, Hamedan, BT5148, BN5150, Zarde 90, KB10, Sabima, BT5124, KB25, Siahe Mashhad, Lambert, Haj Yosefi, BO5187 and BT5154 leaves, respectively.

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# Risk of vector-borne diseases in Romania

Gabriela NICOLESCU[1], Valeria PURCĂREA-CIULACU[1], Alexandru Filip VLADIMIRESCU[1], Elena Claudia COIPAN[1], Alexandru Ionuţ PETRIŞOR[2], Gabriela DUMITRESCU[3], Daniela SAIZU[4], Elena SAVIN[4], Ionuţ C. ŞANDRIC[4], Liviu ZAVATE[4], Florin MIHAI[4]

[1] "Cantacuzino" National Institute of Research, Spl. Independenţei no. 103, 050096 Bucharest, Romania, e-mail: gabrielamarianicolescu@yahoo.co.uk
[2] "Ion Mincu" University of Architecture and Urbanism & National Institute for Research and Development in Spatial and Urban Planning, Bucharest, Romania
[3] Army Center of Medical Research, Bucharest, Romania
[4] S.C. ESRI Romania S.R.L., Bucharest, Romania

**Key words:** re-emerging vector-borne diseases, environmental changes, ecological surveillance, risk areas of re-emergence

Vector-borne diseases are important public health problems in Romania, and their re-emergence has to be prevented and control. Mosquito vectors transmit West Nile virus infections and maintain the risk of malaria reintroduction in Romania, and ticks are vectors of Lyme borreliosis and tick encephalitis.

The global and local environmental changes, including the climatic ones, influence the risk of re-emergence of these diseases by increasing of the distribution and abundance of vector populations and the contact of humans with vectors.

The ecological surveillance is the essential activity for the prevention and removal of these diseases in Romania. It puts in evidence the ecological factors involved in the evolution of vector populations, permits the establishing of risk areas for every disease and the interruption of the transmission cycles by permanent monitoring and control of vectors applying integrated control programmes.

The risk areas of vector-borne diseases in Romania in accordance to the distribution and abundance of different vector species under the influence of the present climatic and other environmental changes are presented.

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# Preliminary results on the effects of stream banks and riparian vegetation changes on terrestrial macroinvertebrate communities in Prahova River Basin

Cristian Andrei MURGU, Darmina DATCU, Geta RÎŞNOVEANU

University of Bucharest, Dept. of Systems Ecology and Sustainability, Spl. Independentei 91-95 050095, Bucharest,Romania, emails: cristianmurgu@yahoo.com

**Key words:** riparian zones, invertebrates, replacement of native vegetation, stream bank changes.

The bidirectional fluxes of energy, matter and information that are crossing the riparian zones interlinking terrestrial and aquatic systems are of very high concern. Being ecotones these areas have a particularly rich biodiversity and represent extremely valuable habitat for numerous species. Furthermore the invertebrate populations that can be found in these areas occupy crucial spots in trophic food webs, thus representing valuable tools for assessing the effects of human-origin disturbances.

The research aims to reveal changes in the species composition and structure of riparian macroinvertebrates communities due to morphological changes of the stream banks and replacement of native riparian vegetation. Field work was conducted in Prahova basin, in two pair sites: reference (upstream) and impacted (downstream). Three pitfall trap nests per site were placed along a perpendicular transect to the stream. Each nest was composed of nine traps displayed circular on a two meter radius.

Preliminary results concerning the species richness of invertebrates and the community structure in the pair sites are presented. They highlight the patterns of species distribution across microhabitats and the effect of identified human pressures. Further researches are needed in order to fully understand the effects of anthropogenic disturbances and to scientifically fundament the reconstruction of riparian zones.

# Butterfly communities (Lepidoptera: Rhopalocera) in heavy metal polluted grasslands. Case study: Copșa Mică (Transylvania, Romania)

Cosmina C. MOLDOVAN[1], Sergiu-Cornel TÖRÖK[2], Corina E. JUDE[1], Ioan TĂUȘAN[1]

[1]"Lucian Blaga" University of Sibiu, Dr. Ion Rațiu, 5-7, 50012, Sibiu Romania, e-mails: m.cosmina25@yahoo.com; emiliajude@gmail.com; itausan@gmail.com
[2]Mediaș Municipal Museum, Mediaș, str. Mihai Viteazul no. 46, 551034, Romania, e-mail: ser.torok@yahoo.com

**Key words:** butterfly communities, heavy metal pollution, diversity.

Copșa Mică is located in Sibiu County (Southern Transylvania), at the confluence of the Târnava Mare and Visa rivers. The area is famous for intensive heavy metal pollution. Here there were present two major pollution sources: Carbosin (closed in 1993) and Sometra (closed only in 2009).

Butterflies are considered valuable bioindicators because they can reveal habitat changes (e.g. grassland degradation), climate change, heavy metal pollution and $CO_2$ emissions.

Field sampling took place between June and October 2014 in nine grassland sites. Butterflies were collected applying the transect method. Altogether, we identified 38 diurnal butterfly species, belonging to four families: Hesperidae, Pieridae, Lycaenidae and Nymphalidae. No individuals belonging to the family Papilionidae were identified, due probably to the lack of adequate host-plants, even though *Daucus carota* a host-plant for *Papilio machaon* Linnaeus, 1758 was found, but in small proportions.

Our results show that both species richness and number of individuals increased with increasing distance from pollution source. Moreover, the similarity analysis showed two distinct butterfly communities related to habitat structure. Local differences in butterfly communities are also mediated by the differences in host-plant resources (few plant species occur in the most intensively polluted sites).

# Distribution of cryptic species of bumblebees (subgenus *Bombus sensu stricto*) in the European North of Russia

Grigorii POTAPOV

Institute of Environmental Problems of the North, Str. Naberezhnaya Severnoy Dviny no. 23, 163000, Arkhangelsk, Russia, e-mail: grigorij-potapov@yandex.ru

**Key words:** bumblebees, cryptic species, European North of Russia.

Recent studies show that the problem of cryptic species has great importance for biodiversity conservation. Only in the last decade, researchers have begun to pay attention to the cryptic species of bumblebees (subgenus *Bombus sensu stricto*) – *Bombus lucorum* (Linnaeus, 1761), *Bombus cryptarum* (Fabricius, 1775), *Bombus magnus* Vogt, 1911. Difficulties to the identification of these species led to the situation that the earlier studies mean them as *Bombus lucorum* complex. However, until now, a lot of studies on various aspects of the bumblebees communities do not distinguish between the three species. As a result, information about ecology and distribution of *Bombus lucorum*, *Bombus cryptarum*, *Bombus magnus* is insufficient or absent for many regions.

Samples for this study were collected from the European North of Russia. According to the administrative division of the Russian Federation, is the regions are represented by Murmansk Province, Republic of Karelia, Kaliningrad Province, Arkhangelsk Province, Nenets Autonomous District. Bumblebees were identified by morphological analysis and DNA barcoding.

Out of the cryptic species *Bombus lucorum*, *Bombus cryptarum*, *Bombus magnus* only the first two occur in the studied region.Zonal distribution of these species are similar to data from Finland. *Bombus cryptarum* completely replaces *Bombus lucorum* in the territories above the Arctic Circle and it is the dominant species in the bumblebees communities of the taiga zone. *Bombus lucorum* has low abundance in the European North of Russia. The highest abundance of this species was recorded on the south-western border of the study region, viz. Kaliningrad Province.

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# Ant communities (Hymenoptera: Formicidae) in heavy metal polluted habitats. Insights from Southern Transylvania (Romania)

Ioana Cristina NEGRILĂ[1], Mădălina M. JERPEL[1], Ioan TĂUȘAN[1]

[1]"Lucian Blaga" University of Sibiu, Dr. Ion Rațiu, 5-7, 50012, Sibiu Romania, e-mails: nc.ioana@yahoo.com; jerpel.madalina@yahoo.com; itausan@gmail.com

**Key words:** ants, heavy metal pollution, diversity, community composition, Copșa Mică.

A high level of contaminants and their environmental effects raise huge concerns. Even if invertebrates are known as reliable bioindicators scarce data is available on the polution effect on ground dwelling communities.

We investigated the effect of industrial heavy metal (Pb, Zn) contamination on ground dwelling ant communities in Copșa Mică surroundings, a highly polluted area from two metalurgical industries. We were interested in the effects of heavy metal pollution on ant community structure, composition and diversity. Ants were sampled with pitfall traps, from different habitats (meadows, deciduous and black locust forests) in July - August 2014.

Altogether we identified 20 ant species belonging to three subfamilies. In terms of species number, the highest value is recorded in the black locust sites. However, the Equitability index indicated the highest value in the case of forest sites. Typical ant communities shape the habitats near Copșa Mică. Forest species such as *Myrmica ruginodis* Nylander 1846*, Temnothorax crassispinus* Karavaiev 1926, *Stenamma debile* Förster 1850 or *Lasius platythorax* Seifert,1991 occurred in the forest sites, whereas *Lasius niger* (Linnaeus, 1758), *Formica cunicularia* Latreille 1798, *Formica rufibarbis* Fabricius 1793 or *Myrmica schenki* Viereck 1903 were identified in the meadow sites. The black locust sites were characterized by the ocurence of *Lasius niger, Myrmica rubra* (Linnaeus 1758) and *Tetramorium* cf. *caespitum.*

Our preliminary results show that despite the intensive pollution in the past, ant communities slowly recover.

# The use of citizen science as a fish distribution tool in the modern era. Case study, the Romanian Black Sea coastline

Viorel-Dumitru GAVRIL[1,2]

[1]Institute of Biology Bucharest, Romanian Academy, Splaiul Independenței 296, Bucharest, Romania, e-mail: viorel.gavril@ibiol.ro.
[2]Oceanographic Research and Marine Environment Protection Society "Oceanic Club", Decebal 41, Constanta, Romania.

**Key words:** citizen science, Romanian Black Sea, fish distribution, marine fish.

In the last years, citizen science has helped scientists understand local environmental conditions and species dynamics. This method provides useful data from the field using local people and requires only low-budget or no funding at all. The downside of this method is the large volume of data that needs to be filtered for scientific accuracy.

With the help of local Romanian Black Sea fishermen members of a Facebook group named "Pescuit la Marea Neagra (Fishing in the Black Sea)", I conducted a survey of the catches reported from November 2014 to October 2015.

181 posts were analyzed in which 29 species were mentioned. Out of them 2 species, *Pelecus cultratus* and *Cyprinus carpio* were freshwater species caught in brackish waters. The most common species were *Trachurus mediterraneus, Liza aurata, Neogobius melanostomus, Mesogobius batrachocephalus* and *Alosa immaculata*. The rarest species were *Babka gymnotrachelus, Callionymus festivus, Chelidonichthys lucerna, Dicentrarchus labrax, Salaria pavo, Sciaena umbra, Squalus acanthias, Symphodus cinereus* and *Uranoscopus scaber.*

This method is a very useful tool for gathering data regarding distribution and number estimates in the modern era, with a low budget and high response rate.

# Reproduction and reproductive behavior aspects of Common Newt in Central Forest (Codrii)

Tudor COZARI[1], Larisa PLOP[2], Ion TODERAŞ[3]

[1]University of Tiraspol, str. Gh. Iablocichin no. 5, e-mail: cozaritudor@gmail.com
[2]Armed Forces Military Academy, 23 Haltei str. 2051, Chişinau, e-mail: larisaplop@yahoo.com
[3]Institute of Zoology, Academy of Sciences of Moldova, 1st, Academiei str., MD-2028, Chisinau

**Key words:** breeding behavior, *Lissotriton vulgaris*, *Triturus* species, central forest ecosystem.

A fundamental and complex study of biology, ecology and ethology of the Common Newt, *Lissotriton vulgaris* has been made in Moldova between 2006 and 2010. Reproduction and behavior have been assessed in a suite of amphibian species. This approach has allowed us to establish that the Common Newt compared to other native amphibian species has a relatively prolonged breeding period and it usually forms populations during this period along with other species such as *Triturus cristatus, Rana dalmatina, Hyla arborea*. These different species exhibit certain specific features that differentiate the spatial and temporal course of reproductive processes and ontogenetic development. This provides a reduction of interspecific competition for breeding and larval populations.

*T. vulgaris* is a long-lived species of newt, with a population structure, size and demographic falling within the parameters representative for populations from central forest ecosystems with relatively constant effectives, but lower than those of *T. cristatus*.

The data on the breeding of this species were gathered from permanent and temporary water bodies. Parameters that can influence the reproductive success in the local populations were studied: spatial distribution, hydrological regime, phytocoenosis composition and microclimate conditions

The breeding behavior of European newts is quite complex and diverse, with certain similarities among species. However, there are certain specific characteristics that prevent hybridization and can also serve as criteria in establishing phylogenetic connections between different species. Usually, the males develop courtship behaviors (e.g. courtship display) that aim to make the females accept the courtship and the subsequent fertilization. *L. vulgaris* presents some highly specific behaviors which are not encountered in the *Triturus* species. One such behavior is the „act of rejection" that has a high biological importance and cannot be easily achieved by larger species in areas with dense vegetation.

These results represent an important methodological support in achieving sustainable monitoring of newt species in forest ecosystems and to assess the environmental status of Common Newt populations. They can also be used to improve the teaching proccess of different ecology and biology classes.

# Habitat use of the Steppe-runner (*Eremias arguta deserti*) in the Danube Delta (Romania)

Paul C. DINCĂ[1, 3]*, Alexandru STRUGARIU[1, 3], Iulian GHERGHEL[2,3], Cosmina M. DRANGA[3,] Ştefan R. ZAMFIRESCU[1, 3]

[1] Faculty of Biology, "Alexandru Ioan Cuza" University of Iaşi, 20A Carol I Blvd., 700505, Iaşi, Romania.
[2] Department of Biology, Case Western Reserve University, 2080 Adelbert Road Cleveland, 44106, Cleveland,Ohio, USA.
[3] Moldavica Herpetological Group, 20A Carol I Blvd. 700505, Iaşi, Romania
*Corresponding author, P. C. Dincă, e-mail: paul.cristian.dinca@gmail.com

**Key words:** *Eremias arguta deserti*, Danube Delta, endangered,

*Eremias arguta deserti* (Pallas, 1773) is a diurnal species occupying dry, open areas with some herbaceous vegetation also occurring in steppe habitat, sandy coastal areas, sparsely vegetated river plains, and stone walls bordering partly cultivated land. It is a widespread species ranging from eastern Romania, through southern Moldova, Ukraine (including the Crimean Peninsula), southwestern Russia, the Caucasus, northern Iran, through much of Central Asia to northwestern China and southwestern Mongolia.

Romanian populations of the Steppe-runner represent the western limit of the species distribution, occupying a small territory with the majority being concentrated along the sand deposits from the Danube Delta and one isolated population located in the Sand Dunes of Hanu Conachi Natural Reserve (Galati County).

Worldwide *Eremias arguta deserti* is classified as Near Threatened (NT) by The IUCN Red List of Threatened Species, in Romania being considered an endangered species. Despite its wide range, few previous studies aimed to understand the ecology of species, especially in the west part of its distribution. The current study was carried out in the Danube Delta along the sandy beaches of Sfântu Gheorghe and Vadu (Tulcea County). The paper aims to investigate microhabitat selection of the Steppe-runner in the two mentioned habitats, its use and to observe any correlation between the two and the present landscape. This study represents a contribution to the ecological knowledge regarding this species and present implication for the conservation of this endangered taxon at the western limit of distribution.

# Cultural ecosystem services assessment in Small Island of Brăila Natural Park using photo-analysis

Tudor RACOVICEANU[1], Relu GIUCĂ[1], Constantin CAZACU[1], Mihai Cristian ADAMESCU[1], Georgia COSOR[1], Marius BUJOR[1]

[1]"University of Bucharest, Faculty of Biology, Department of Systems Ecology and Sustainability, Adrress: Splaiul Independenţei 91-95, 050095 Bucharest, Romania, phone 021.318.15.71, email: tudor.racoviceanu@drd.unibuc.ro

**Key words:** Small Island of Braila, ecosystem services, cultural services, photo-analysis.

Ecosytem services are defined as the contribution of natural systems to human well-being. Latest ecosystem services framework developed by the European Environment Agency (EEA), The Common International Classification of Ecosystem Services (CICES), takes into account three general categories of ecosystem services: provisioning, regulating and cultural while supporting services are considered as key proccesses that facilitate all the other outputs inlcuding services.

In most cases provisioning and regulating services were assessed and valued since they are considered the most important for human development, having a wide range of tools developed. Our work highlights that cultural services have often been neglected by scientific community due to the lack of assessment frameworks, difficutly to value, a.s.o.

We focused on indentifying and mapping the main cultural ecosystem services provided by the Small Island of Braila Natural Park based on the public perception of the natural wetland system. We chose the photoseries analysis method of free geo-tagged photographs available on Flickr and Panoramio media databases.

The data screening process allowed the identification of more than 1400 preliminary photographs from both databases, available for the study area. During the screening process we eliminated wrong geo-tagged positions, and photographic content not suitable for cultural ecosystem services analysis. Finally less than 600 photos were selected for further analysis. We counted the occuring frequency of a particular cultural service and analyzed it by comparison with other cultural services identified.

The results show that most of the photographs of the study site reflect the high aesthetic value of the natural wetland system, and for biodiversity while leisure activities such as fishing and birdwatching are the main activities undertaken by tourists in the area.

# Factors that attract birds on International Airport Craiova (Romania) and surroundings countermeasures and to minimize its effects

Mirela Sabina RIDICHE[1], Tudor Ciprian Radu PĂTRUȚOIU[2], Angela PETRESCU[3]

[3]" Museum of Oltenia Craiova – Natural Ciences Department, 8 Popa Șapcă Str., Craiova, 200422, Romania, e-mail: rimirela@yahoo.com
[2]S. C. Explo 06 S.R.L., Craiova, Romania, e-mail: tudorpatrutoiu@yahoo.com
[3]"Grigore Antipa" National Museum of Natural History, Şos. Kiseleff no. 1, 011341 Bucharest 2, Romania, e-mails: angelap@antipa.ro

**Key words:** attractive factors, birds, countermeasures, airport, Craiova.

With the expansion of air traffic, the problem of risks generated by birds is of general interest (Thorpe, 1990), already being addressed by specialist from our country (Petrescu, 2002; Ridiche, Munteanu, 2015).

Following direct observations made in all seasons, we found that some species of birds, both sedentary and migratory, are common in the International Airport of Craiova (I.C.A.) and immediate surroundings, others only transiting the area.

Temporary stationing or long term of birds in the zone of airport is due to natural and anthropogenic factors that generate trofic resources and posibilities of resting and nesting for an important number of species. The presence of birds, especially of gregarious behavior (ex. *Columba livia domestica, C. palumbus, Hirundo rutsica, Corvus frugilegus*, *C. monedula, Sturnus vulgaris, Passer* sp. etc) or large ones (ex. *Phasianus colchicus, Buteo buteo, Ardea cinerea, Ciconia ciconia,* etc) is the source of accidents that could jeopardize safety of aircraft that take off / land in the perimeter of I.A.C. For that reason we propose a series of measures that could help as an attractive counter generated by environmental factors. Implementing the measures set contribute to preventing risks to air traffic, but, for development and maintenance of standards for optimal habitats from the airport (unway surroundings, A.I.C. neighborhoods), besides the airport administration, is need to involve all landowners in the vicinity of I.A.C.

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# Particularities of waterfowl distribution during winter in artificial lakes of the Olt Valley (Transylvania, Romania)

Gabriela CUZEPAN[1], Liviu PRIPON[1], Anca BUCUR[2], Raluca STOICA[1], Cătălin FUCIU[2], Adrian RĂULEA[2], Ioan TĂUȘAN[2]

[1]Natural History Museum, Brukenthal National Museum, Cetăţii 1, Sibiu, Romania, gabrielacuzepan@gmail.com, liviu.pripon@gmail.com, ralucastoicas@yahoo.com.
[2]Lucian Blaga University of Sibiu, Dr. I. Raţiu 5-7, Sibiu, Romania, anck91@yahoo.com, itausan@gmail.com, fuciu_cata@yahoo.com, rl_adisor@yahoo.com

**Key words:** wetlands, artificial lakes, hydroelectric plant, winter monitoring, behavioral ecology.

Waterfowl are considered to be an important component of aquatic ecosystems. Analyzing bird species abundance, distribution and frequency in locally formed assemblages we can obtain important information about their communities.

In this study we aimed to reveal how a series of lakes formed on the Olt water course differentiate between them regarding waterfowl communities and how significant is this variation.

We carried out ten point observations each corresponding to one lake, between Bradu village and Olteţ village. These lakes are formed by damming therefore in this study we had five points corresponding to upstream lakes and five to downstream lakes. Observations were made in the morning and in the evening during January-February 2015 in ten field trips.

We found the lakes having different degree of variance in species present between their ranges. Our results show that only two lakes can be considered significant different in terms of waterfowl community structure. Due to the hydroelectric plant, the downstream lakes that remain unfreeze in cold conditions can concentrate more birds but because of their conformation lesser species. Because irregular species distribution all the lakes have their particularity and must be inspected when a general monitoring program is aimed. From an ecological point of view this study shows an erratic behavior of birds in winter as well some habitat preferences.

# Temporal variability of wintering waterfowl communities (How stable bird species are on a short time scale?)

Liviu PRIPON[1], Gabriela CUZEPAN[1], Anca BUCUR[2], Raluca STOICA[1], Cătălin FUCIU[2], Adrian RĂULEA[2], Ioan TĂUŞAN[2]

[1]Natural History Museum, Brukenthal National Museum, Cetății 1, 550160, Sibiu, Romania, liviu.pripon@gmail.com, gabrielacuzepan@gmail.com, ralucastoicas@yahoo.com.
[2]Lucian Blaga University of Sibiu, Dr. I. Rațiu 5-7, 550024, Sibiu, Romania, anck91@yahoo.com, fuciu_cata@yahoo.com, rl_adisor@yahoo.com, itausan@gmail.com.

**Key words:** wetlands, artificial lakes, damming, winter monitoring, Olt Valley, behavior ecology, hydroelectric plant.

Existing studies about bird' annual, seasonal as well daily dynamics do not cover all the aspects of erratic behavior of waterfowl on limited periods of time. Moreover there is a lack in data concerning community space stability, especially during winter when birds are known to be more erratic.

Our aim is to find the degree in which birds are stable in one fixed space therefore how much an investigated lake varies in time, considering its waterfowl community.

We analyzed ten artificial lakes formed by damming Olt water course between Bradu village and Olteț Village (Sibiu County and Brasov County – Romania). We made ten observations between January and February 2015, in the morning as well as in the evening. Analyses consisted in evaluating variation of species presence and abundance.

Results show that even on a short time scale, there are significant temporal differences in community composition. Concerning the number of species, we found two distinct situations in extremes. There are periods when species are more dispersed and periods when they are more concentrated mostly because certain lakes do not freeze. In terms of abundance the cluster analysis revealed four groups: high, normal, low and very low density.

# Constanța Harbour as an important wintering refuge for waterbirds

Viorel-Dumitru GAVRIL[1,2], Cătălin-Răzvan STANCIU[2,3],
Ioana COBZARU[1], Răzvan POPESCU-MIRCENI[2]

[1]Institute of Biology Bucharest, Romanian Academy, Splaiul Independenței 296, Bucharest, Romania, e-mails: viorel.gavril@ibiol.ro, ioana.cobzaru@ibiol.ro.
[2]Oceanographic Research and Marine Environment Protection Society "Oceanic Club", Decebal 41, Constanta, Romania, e-mail: club@oceanic.ro.
[3]University of Bucharest, Faculty of Biology, Splaiul Independenței 91-93, Bucharest, Romania, e-mail: stanciucatalinbio@gmail.com;

**Key words:** wintering refuge, bird migration, Black Sea, wetlands, Constanţa Harbour.

Black Sea coastal wetlands support a rich and significant diversity of habitats, such as deltas, coastal lagoons and bays, silt and sand flats, as well as artificial wetlands. These wetlands are critically important for many, often endangered species. The Black sea coast is of critical importance for millions of migratory waterbirds on the African–Eurasian flyway. Fifteen out of the 27 globally threatened European bird species occur in the Black Sea region during the breeding and wintering season and, of these, seven are totally wetland dependent. The wetlands of the Black Sea basin provide refuge for 25 million migrating waterfowl every year (Kostiushyn et. al, 2009).

International Waterbird Count – IWC is an international program coordinated by Wetlands International and implemented in more than 100 countries with the purpose to census and it enhances current knowledge on the size and trends of over 2000 waterbird populations worldwide. We joined the program together with Romanian Ornithological Society and covered the commercial harbor of Constanța during 2014 and 2015, but also covering the whole wintering season from October to March, in 5 field session.

We concentrated our efforts on the harbor area, it being a close site with closed access to the public. The commercial harbor of Constanța is a very anthropic area used by birds in great number during winter. We recorded 63 species of birds, of which 53 have been included in the EC Birds Directive. In the harbor area were observed 39 species of waterbirds. The total number of birds counted in the 5 field sessions was of 87964 and the maximum number recorded in one field session was 63453. These birds use the harbour as a winter refuge due to the shelter it provides from the winter storms at sea, lack of natural predators and access to food from the grain silos.

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# Water Rail's social behaviour revealed by reaction to conspecific and heterospecific playbacks

Alexandru Nicolae STERMIN[1], Alin DAVID[1],
Eliana Maria SEVIANU[2], Ioan COROIU[1]

1. Department of Taxonomy and Ecology, Babeş-Bolyai University, Clinicilor 5-7, Cluj-Napoca, Romania, e-mail: sandu.stermin@yahoo.com
2. Department of Environmental Science, Babeş-Bolyai University, Fântânele 30, Cluj-Napoca, Romania.

**Key words:** aggressivity, body mass, competition, nest parasitism, niches overlaps.

The Water Rail's (*Rallus aquaticus*) reaction to conspecific and heterospecific playback was studied to reveal any variation in reaction to playbacks of rail and crake and if and how these reactions change in intensity. A number of 10 observation points, 100 m from each other inside a reedbed, were selected. Observations were conducted three times a day over three days in three sessions (April, June and September). The number of Water Rails individuals which react to conspecific and heterospecific playback (Moorhen (*Gallinula chloropus*), Corncrake (*Crex crex*), Little Crake (*Porzana parva*), Spotted Crake (*P. porzana*) and Baillon's Crake (*P. pusilla*)) were quantified. We found that there is a difference in aggressive reaction between conspecific and heterospecific playbacks across all sessions and also within each session.

The aggressive reaction decreases significantly in the direction (Water Rail = Moorhen) > (Corncrake = Little Crake = Spotted Crake) > (Baillon's crake), during the first session and (Moorhen) > (Water Rail) > (Corncrake = Little Crake = Spotted Crake = Baillon's crake) during the second session. In conclusion we found that Water Rail reacts differently to conspecific and heterospecific calls.

The reaction intensity changes from one session to another and the level of reaction to different species also changes. Most of the aggressive reaction levels can be explained by nesting place and food competition, but also nest parasitism behaviour and body mass differences.

# Long term monitoring of sandpipers (*Tringa* species) from the Razelm – Sinoe lagoon area

Laurenţiu PETRENCU, Emanuel Ştefan BALTAG

Faculty of Biology, "Alexandru Ioan Cuza" University of Iaşi, Bd. Carol I, 20A, 700505, Romania, e-mail: laurentiupetrencu@gmail.com

**Key words:** sandpipers, Danube Delta Biosphere Reserve, migration.

The study area of our monitoring is represented by the Razelm – Sinoe lagoon area together with Sărăturile – Murighiol strictly protected area and Plopu – Beibugeac Lake. This wetlands, are located in the south part of the Danube Delta Biosphere Reserve having a total surface of 1163.81 km$^2$. The main habitats from this area are represented by: lagoon, marshlands, agricultural lands, rivers, lakes, beaches and pastures, habitats which are highly important for waterbird breeding and stop over during migration.

Between 2008 and 2015 we have conducted shorebird surveys focusing on sandpipers (*Tringa* sp.) in the area mentioned above using fixed observation points and transect methods. During these surveys 6 *Tringa* species were recorded. For the breeding season only one species, Common redshank (*Tringa totanus*), was recorded. All six species were recorded during spring and autumn migration, with a population peak in August (50.67 % of the total recorded individuals). The most common species recorded during the study were Spotted redshank (*Tringa erythropus*, 31.09 %), Marsh sandpiper (*Tringa stagnatilis,* 27.03 %) and Wood sandpiper (*Tringa glareola*, 20.62 %). The most unrepresented species for our study area was Green sandpiper (*Tringa ochropus*, 5.53 %). During winter, only one species was recorded, Common greenshank (*Tringa nebularia*), but in a very low number of individuals.

The highest numbers of migrating sandpipers were recorded in March - April (for spring migration) and July – August (for autumn migration). These months offers a high food resources and good roosting places which are necessary for migrating sandpipers.

The study gives us new data on the *Tringa* genus from the Razelm - Sinoe lagoon area of the Danube Delta Biosphere Reserve emphasizing the importance of this site for breeding and migratory sandpipers.

# Ethological study of the rook (*Corvus frugilegus* L.) in Iași metropolitan area (Iași County) and its ecological requirements assessment

Emanuel TÂRNOVEANU[1], Adrian URSU[2], Pavel ICHIM[2], Alexandru AMĂRIOAREI[3]

[1]Independent researcher, Iasi, 88 Vasile Lupu Str., Bl. Z, 2nd floor, 700341, Romania, e-mail: emantarn@yahoo.com
[2]"Alexandru Ioan Cuza" University of Iași, Faculty of Georaphy and Geology, Department of Geography, RO-700505, Iasi, 20 A Carol I Blvd, Romania
[3]National Institute of R&D for Biological Sciences, Department of Bioinformatics, 296 Independetei Str., Bucharest, Romania, email: alexandru.amarioarei@incdsb.ro.

**Key words:** rook, social behaviour, active nests, breeding success, buffer zone, land use.

The types of land use that dominate Iași metropolitan area are agricultural crops and pastures, both of them corresponding to the ecological requirements of rooks (*Corvus frugilegus* L.). While brooding chicks, this species is the most likely to forage on open fields and especially grasslands. The successful breeding pairs are dominant birds, whose behavioural repertoire is easily analyzable and interpretable. The main interactions within the population regard the pair formation, colonial breeding, and the association into larger groups, usually composed of families with juveniles. Although the rooks use their own territory around the colony for foraging, in summer they join other groups, synchronizing their movements in a shared feeding ground, which will always be situated close to a river.

Our study is based on a description of a population breeding in Tătăraşi neighborhood (Iași) and it covers the behavioural traits with a view to assessing the ecological requirements across a multifunctional shared habitat including feeding, roosting and nesting sites. Our data take also into consideration the offensive-defensive interactions between the Long-eared owl (*Asio otus* L.) and the Rook. The effects of this relationship are noticeable in the populations of Iași city in the breeding season, being restricted to the vernal aspect.

The peculiarities of the above mentioned shared habitat reflected in the rooks' social behaviour were analyzed through G.I.S. techniques extracting the land use categories from Corine Land Cover and the elevation values from S.R.T.M. (Shuttle Radar Topography Mission).

# Determining the putative wintering quarters of Marsh Warblers (*Acrocephalus palustris*) with remote-sensing

Tamás MIHOLCSA, Tibor CSÖRGŐ

Eötvös Loránd University, Department of Anatomy, Cell- and Developmental Biology, Pázmány Péter sétány 1/C, 1117 Budapest, Hungary, e-mail: mihhok@gmail.com

**Key words:** bird, migration, survival, Africa, NDVI, long-distance migrant.

With the classic capture-recapture method the African wintering quarters of small passerines is very hard to identify. In spite of strong ringing efforts, there is little knowledge accumulated about the wintering areas of many species/ populations, therefore new alternative methods are needed to study migratory connectivity.

Ecological conditions (food abundance) on wintering quarters can be well approached with the Normalized Difference Vegetation Indices (NDVI) of the respective areas. Therefore in many cases there is a strong correlation between NDVI and wintering bird survival. This relationship is an alternative possibility to study migratory connectivity.

The calculation of survival rates needs numerous capture-recapture data and presumes the use of complex models, which in many cases is not possible because of the lack of appropriate data. In this study we have tested a simple annual survival index calculated from the abundance of different age classes. For the calculation of these indices we have used the data of 4300 Marsh Warblers ringed at Ócsa Ringing Station (Hungary) between 1985-2008 by standardized conditions.

To identify the putative wintering quarters of Marsh Warblers we have used Spearman`s rank correlations between annual survival indices and average African NDVI (for each pixel, 8x8 km resolution) for the period 1st January – 31th March (mean wintering period final wintering quarters). We have illustrated the pixels with high *R* values (R>0.4) on the map of Africa.

Our resulted final wintering quarters are in the Southern and Eastern parts of Namibia, Botswana and the Western region of South Africa. Our results are mostly consistent with information from literature, but wintering areas emerged in regions outside the species general distribution. Presumably Marsh Warblers are present here, too, but because field observations in these regions are very rare/ absent, the species haven`t been observed yet.

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# Nesting habits of the Northern Goshawk (*Accipiter gentilis*) in peri-urban environments from Eastern Romania

Mihail V. HUȚULEAC-VOLOSCIUC, Alexandru STRUGARIU, Ioana HUȚULEAC-VOLOSCIUC, Constantin ION

Faculty of Biology, "Alexandru Ioan Cuza" University of Iaşi, Blvd. Carol I No. 20 A, 700505, Iaşi, Romania.
E-mail: m.hutuleac@gmail.com

**Key words:** Accipiteridae, reproduction, habitat, landscape, urban environments.

The Northern Goshawk (*Accipiter gentilis*) is a diurnal raptor with a Holarctic distribution range. The species is typically a woodland specialist and uses a variety of forest types for nesting and foraging, even ones located in or around human settlements. In certain regions, such as many rural or urban Romanian areas, as a result of the species' preferences for domestic fowl (especially homing pigeons), the goshawk is considered a pest and is actively persecuted.

Here, we aimed to investigate nest site characteristics and monitor occupancy in goshawk populations from two urban and peri-urban areas from Eastern Romania. Several nest site (e.g. nest size and position, tree species, tree size), and landscape (e.g. distance to forest edge, distance to nearest road, distance to nearest house, or to the nearest water source) characteristics were recorded and nest occupancy was monitored during the 2006-2014 period. The results indicate a broadly similar pattern of nest site selection in both studied regions. Tree species presented high variation but *Quercus* and *Acer* species were the most commonly used. Most landscape characteristics presented a high variation, but the distance from the nest to the nearest house was always higher than 100 m.

Long term (multi-year) occupancy of nest sites was observed very rarely and was not explained by any of the recorded variables.

# Concerning the present changes in the number of the Saker Falcon (*Falco cherrug* Gray, 1834) in Republic of Moldova

Andrei MUNTEANU, Nicolai ZUBCOV, Vasili CRUDU, Larisa BOGDEA

Institute of Zoology, Academy of Sciences of the Republic of Moldova, e-mail: munteanuand@rambler.ru

**Key words:** birds, Saker Falkon (*Falco cherrug*), ground squirrel, Republic of Moldova.

The number of the Saker (*Falco cherrug* Gray, 1834) in the Republic of Moldova subjected to fluctuations since the 70's of the last century. In the middle of the last century, the Saker was a common breeding species (Averin et al, 1981; Ganea & Zubcov, 1989). However, at the end of the 20$^{th}$ century, the population of this species decreased quite dramatically. It disappeared from the northern and central parts of the country. During the study of the area in the early 2000s, the Saker was found in only the south of the country in the number of 10-13 pairs (Munteanu et al, 2007). This phenomenon was associated with the moving of nesting to the high-voltage pillars caused by increase of the population of the crow, which is the supplier of nests for the Saker in the steppe regions, and by the maintenance of the number of spotted ground squirrel. The reason for the sharp decrease in number of the Saker, many authors consider on the one hand the fall in number of ground squirrels as the main feeding object, on the other hand - the development of falconry. According to our research, the number of the Saker in the south of the republic did not last long, and in 2009-2012 began to decline. In 2013, only 3 pairs of these birds have been recorded and in 2015 - only one. In 2005 observations showed that in the breeding area of the Saker five relatively large and compact colonies of spotted ground squirrel (*Spermophilus suslicus* Guld.,1770) were observed, as well as a few scattered colonies of this species, so that the number of the Saker began to grow. However, in early 2009, because of the climate aridization and overgrazing, the compact colonies of the ground squirrels have disappeared and in general their number decreased essentially. Thus, the availability of basic food of the Saker declined sharply. There have been some reports that the Saker began to feed with rook, are supported to some extent by our research. The traces of rook were found in two out of four nests. According to our observations, stimulated transition of the Saker to feed with rook in the case of shortage of the basic feed occurs during the feeding of their nestlings, which coincides with the appearance of rook's fledglings. This ability is demonstrated by more adaptive pairs of the Saker during feeding of nestlings.

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# Variations in terrestrial small mammal communities along a vegetation gradient in Southern Transylvania (Romania)

Ana Maria BENEDEK, Ioan SÎRBU

"Lucian Blaga" University of Sibiu, Faculty of Sciences, Department of Environmental Sciences and Physics, Dr. I. Rațiu St.no. 5-7, RO-550012 Sibiu, Romania, e-mail: benedek_ana@yahoo.com, meosirbu@yahoo.com

**Key words:** rodents, shrews, CCA, tree and shrub cover, *Microtus arvalis, Apodemus flavicollis*

Transylvania presents a high diversity of its landscape, with a very wide range of habitat types. As a result, small mammal communities found in this region are relatively diverse. We examined the variation of their structure in a heterogenous area in Hârtibaciu and Târnava river basins, in relation to vegetation characteristics.

The study area represents a mosaic of small patches of different land use. In summer and autumn 2003, 2010 and 2011 we set live traps in 84 habitats, both cultivated and semi-natural, grouped in 15 habitat types.

We performed a canonical correspondence analysis (CCA) using as habitat factors four vegetation variables (cover of trees, shrubs and herbaceous layer, height of herbaceous layer) and as species variables the presence-absence data, relative abundance and capture index. Since the results based on the three data sets are similar, we choose to illustrate the results based on log-transformed relative abundances, to reduce the influence of different capture effort among the researched habitats.

The community structure was strongly shaped by vegetation characteristics, even in the case of small land patches. CCA revealed the significance of both the first canonical axis and all the axes. The first axis was directly correlated with the tree and shrub cover. The dormice, *Glis glis* and *Muscardinus avellanarius*, the bank vole, *Clethrionomys glareolus*, and the yellow-necked mouse, *Apodemus flavicollis* were dependent on woody vegetation. All the other species are open habitat species, except for the wood mouse, *A. sylvaticus*, which in Transylvania seems to be characteristic for habitats with mixed woody and herbaceous vegetation. The ratios of dominant rodents varied significantly along the vegetation gradient. The proportion of the common vole, *Microtus arvalis*, monodominant in hayfields and pastures, decreased along with the increase in woody vegetation cover, in favour of *A. flavicollis*, monodominant in woods.

# Catastrophic impact of drought from 2015 upon mammal diversity from ”Hîrbovăț” Landscape Reserve

Veaceslav SÎTNIC

Institute of Zoology of Academy of Sciences of Moldova, Academiei str, 1, Chișinău, MD-2028, sitnicv@gmail.com

**Key words:** mammals, diversity, “Hîrbovăț”Landscape Reserve

“Hîrbovăţ” Landscape Reserve is located in the south-east of the country, 50 km from Chișinău city, in lower Byc plain. It is situated on the watershed on the bordering slopes of Byc and Nistru rivers and of thier small tributaries, with an average impact of anthropogenic and natural processes. It presents a valuable flora and fauna. “Hîrbovăţ” Landscape Reserve is represented by downy oak, oak and smoke tree forest particular for Moldova. 26 species of mammals have been identified, of which the main species are: *Talpa europaea*, L. *Dryomys nitedula* Pall., *Muscardinus avellanarius* L., *Apodemus sylvaticus* L., *Apodemus flavicollis* Melchior, *Vulpes vulpes* L., *Sus scrofa* L., *Capreolus capreolus* L., *Mustela nivalis* L.

The year 2015 was characterized by a catastrophic drought, particularly pronounced in the study area. In May and during the summer rainfall was negligible while continuously registering temperatures of 35-38° C. This fact influenced upon the diversity of mammals, most of which are found in the decreasing phase of the number. The index of edge effect has the following values for the three studied biotypes: meadow – 1.65, ecotone – 1.92 and forest – 2.34. It was determined the distribution of mammals according to the biotope preference: meadow – 14%, ecotone – 56% and forest – 30%. The Simpson index in April in studied habitats was 0.278 in the meadow, 0.452 in ecotone and 0.622 in woods, while and after a long period of drought, in late summer, we recorded a considerable decrease in the index, the diversity being 0.072, 0.104 and 0.109 respectively. The reproductive process was considerably affected in all the studied species.

Along with mentioned abiotic factors, a considerable negative influence on the mammals has been overgrazing, cleaning the forest edge of shrubs, destruction of dense vegetal cover, removing of dry or fallen trees, deforestation of hollow and old trees, cuttings in the oak forests. It is also high the disturbance factor from local population and those who are resting in that territory.

The work was performed within the fundamental project 15.187.0211F.

# Using species distribution modeling to identify mammal sensitive areas in Romania

Constantin CAZACU[1], Mihai Cristian ADAMESCU[1], Ovidiu IONESCU[2,3], Georgeta IONESCU[3], Ramon JURJ[3], Marius POPA[3], Simona Roxana CAZACU[3,4], Ancuţa COTOVELEA[2,3]

[1] Department of Systems Ecology and Sustainability, University of Bucharest, Splaiul Independenţei 91-95, 050095, Bucharest, Romania, e-mail: constantin.cazacu@g.unibuc.ro
[2] Transilvania University, Faculty of Silviculture and Forest Engineering, Department of Silviculture, 1 Beethoven Lane, 500123, Braşov, România,
[3] National Institute for Forestry Research and Development, 13 Cloşca Street, 500040, Braşov, Romania
[4] National Institute for Forestry Research and Development, 128 B-dul. Eroilor, Voluntari, Ilfov, Romania

**Key words:** GIS, carnivores, maximum entropy, habitat fragmentation, wildlife corridors

Human development affected the quality of species' habitats all over the world. Therefore, knowing the distribution of the "best places for species" and their preservation is of crucial importance to insure sustainable development. Romania still preserves a rich biodiversity that is under increasing pressure due to general economic development (mainly agriculture) and demand for transportation infrastructure. In order to successfully implement the legislative goals agreed at EU level (e.g. for nature conservation), management decisions have to be supported by scientific knowledge. We explored the potential of using suitability models to identify important areas for mammals of conservation interest in Romania. Analysis consist of using geomorphological characteristics, distribution of ecosystems and species presence data as input for a maximum entropy model. We considered for analysis five carnivorous species as follows: Brown Bear, Grey Wolf, Golden Jackal, Lynx and Wild Cat. All data sets were georeferenced and integrated into a geographic information system for further analysis. Suitability scores were classified into very suitable to unsuitable and mapped. The very suitable areas for each species were then merged into a single map and intersected by transportation infrastructure in order identify critical zones for mammals. On the basis of model outcomes, we can identify areas where special attention has to be paid, for instance, to establish wildlife corridors in order to avoid habitat fragmentation, or development of nested models with higher resolution for more accurate results where needed.

# Comparing different environmental variables of Western Palearctic hedgehogs (*Erinaceus* spp.) in predictive models

Sadık DEMİRTAŞ[1], Duygu TİRYAKİ DENER[1], İslam GÜNDÜZ[1]

[1]Ondokuz Mayis University, Faculty of Arts and Sciences, 55139 Kurupelit, Samsun, Turkey, e-mail: sadikd@omu.edu.tr; duygu.tiryaki@omu.edu.tr; gunduzi@omu.edu.tr

**Key words:** *Erinaceus*, MAXENT, AUC, Western Palearctic

The present study aims to understand comparing different environmental variables of hedgehogs (*Erinaceus europaeus*, *E. roumanicus*, *E. concolor*) distributed in the Western Palearctic. Bioclimatic data obtained from WorldClim–Global Climate Data (http://www. worldclim.org/current) at a spatial resolution of 2.5 min and ecological niche modelling used to describe distribution. We compiled data from previously published articles to gather the records (for *E. europaeus* 225; *E. roumanicus* 265 and *E. concolor* 307 records). These records were georeferenced using Google Earth ver. 7.1 and re-checked.

The coordinates of each record has been transferred to MAXENT ver.3.3.3k program (http://www.cs.princeton.edu/~schapire/maxent) to create the distribution maps for each species using 19 bio-climatic variables. In addition, All GIS operations were conducted using DIVA-GIS, ver. 7.5 (http://www.diva-gis.org) and ARCGIS ver. 10.2.

The area under the curve (AUC) for training data was obtained (0.988 for *E. europaeus*; 0.986 for *E. roumanicus*; 0.984 for *E. concolor*). The percentage contribution and/or permutation importance showed the most significant bioclimatic variables determined for each species. We also determined the annual precipitation, annual mean temperature and altitude information valuable for each species.

For all three species the ecological relation has been shown with 19 bio-climatic variables represented by Principal Component Analysis (PCA) graph.

# Deep haplotype divergence between native and invasive populations in *Anodonta* (*Sinanodonta*) *woodiana*

Oana Paula POPA[1], Martin REICHARD[2], Karel DOUDA[3], Marianna SOROKA[4], Larisa-Bianca DUMITRESCU[1], Elena Iulia IORGU[1], Ana-Maria KRAPAL[1], Alexandra Florina LEVĂRDĂ-POPA[1], Luis Ovidiu POPA[1]

[1]"Grigore Antipa" National Museum of Natural History, Şos. Kiseleff no. 1, 011341 Bucharest 2, Romania, e-mail: oppopa@antipa.ro
[2] Institute of Vertebrate Biology, Academy of Sciences of the Czech Republic, Květná 8, 603 65 Brno, Czech Republic
[3]Department of Zoology and Fisheries, Czech University of Life Sciences Prague, Kamýcká 129, 165 00 Prague, Czech Republic
[4] University of Szczecin, Department of Genetics, Felcaka 3c, 71-412, Szczecin, Poland.

**Key words:** COI gene, haplotype, genetic diversity, invasive species

The Chinese huge mussel, *Anodonta woodiana* (Lea, 1834) is one of the largest invasive freshwater Unionid species present in the European Fauna. The species is native to South Eastern Asia, Indochina, China, Korea, Japan, Taiwan and the Amur Basin in Eastern Russia. We investigate the pattern of genetic diversity in native and invasive populations of the species, using a mitochondrial CO1 gene fragment, as part of a larger project aiming at establishing the invasion history of *A. woodiana* in Europe. In 84 analyzed specimens (our samples and GenBank sequences) we identified 12 COI haplotypes. All the European specimens, from nine populations, shared a single COI haplotype, while the seven native area populations (China and South Korea) exhibit a number of 11 COI haplotypes. A deep genetic divergence (107 mutated positions out of a total of 390bp) was recorded between the European haplotype and the ones from the native area. Two hypotheses could explain these findings. On the first hand, our results could suggest that the European populations exhibit the founder effect, being established by a small number of individuals from a population which was not sampled in the present study. This hypothesis is correlated with the present knowledge about the introduction of the species in Europe, which is considered to be linked with an import of Chinese Carp infested with *A. woodiana* glochidia, from the Amur River, between 1963 and 1965. On the other hand, the large genetic gap could be explained by the existence of a number of cryptic species currently designated as *A. woodiana*.

# Competition for space between zebra and quagga mussel. Differential impact of *Dreissena polymorpha* and *D. rostriformis* infestation on unionid mussels

Ioana MATEI

Independent Researcher, e-mail: ioana.matei015@gmail.com

**Key words:** *Dreissena polymorpha*, *Dreissena rostriformis*, competition, dominance shift, invasiveness

Biological invasions are one of the most serious threats to global biodiversity. The zebra mussel *Dreissena (Dreissena) polymorpha* is listed among the World's worst invasive species, being considered one of the most aggressive freshwater invaders with a high impact on local biodiversity and ecosystem services in Europe and North America. Recently, its congener, the Quagga mussel *D. (Pontodreissena) rostriformis* also started to rapidly invade large parts of Western and Central Europe, thereby outcompeting the long-established Zebra mussel. Whereas the exact reasons for the competitive advantage of the Quagga mussel remain unknown, its higher fitness may play a role as the Quagga mussel shows substantially higher growth rates and growth dynamics than the Zebra mussel, providing it with an advantage in the competition for space and food (Jopp et al., unpublished data).

Among the effects dreissenids have on native biota, the use of unionid mussels as substrate is of particular concern. Individuals attach themselves to unionid shells, inhibiting their normal activity (feeding, respiration, locomotion). Significant declines in unionid densities and even local extinctions have been observed where *Dreissena* spp. infestations occurred (Ricciardi et al., 1996).

Considering the dominance shift from Zebra to Quagga mussels, an important direction for future investigations is to test if the two congeners differentially impact unionid mussels in their competition for space. Using a climate chamber with fully controlled conditions, the goal of my study is to test their substrate preference (live unionids, dead unionids valves, other hard substrate) in different intra- and interspecific competition scenarios, assessing the differential effects of Zebra and Quagga mussel infestations on unionids. The experiment will use the introduced unionid *Sinanodonta woodiana* as target species.

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# The first record of the Quagga mussel *Dreissena rostriformis bugensis* in Poland, confirmed by genetic studies

Brygida WAWRZYNIAK-WYDROWSKA[1], Marianna SOROKA[2], Marta ŁUKASZCZYK[2], Adam WOŹNICZKA[3], Teresa RADZIEJEWSKA[1], Anna SKRZYPACZ[1]

[1] University of Szczecin, Unit of Palaeoceanology, Mickiewicza 18, 70-383 Szczecin, Poland, e-mail: wydra@univ.szczecin.pl
[2] Universiry of Szczecin, Department of Genetics, Felczaka 3c, 71-412 Szczecin, Poland, e-mail: marianna.soroka@univ.szczecin.pl
[3] National Marine Fisheries Research Institute in Swinoujscie, Kalataja 1, 81-332 Gdynia, Poland

**Key words:** invasive species, mitochondrial DNA, genetic diversity, Blast analyses.

The Quagga mussel (*Dreissena rostriformis bugensis* Andrusov, 1897) is a Ponto-Caspian freshwater bivalve which, in addition to the Zebra mussel (*Dreissena polymorpha* Pallas, 1771) has been successfully colonising European aquatic areas since the beginning of the 20th century. In 1940-1990, *D. rostriformis bugensis* expanded its range by using aquatic systems of European rivers, including those of the Dnieper, Don, Volga and Dniester. At present, the species is known from Romania, the Netherlands, Germany, France, Hungary and the United Kingdom.

In 2014, *D. rostriformis bugensis* was for the first time recorded in the Szczecin Lagoon (North-West of Poland). That was also the first record of the species in the entire catchments of the Baltic Sea. Current observations allow to conclude that the species, new for the fauna of Poland, is already abundant and widespread in the Lagoon where it forms a robust population coexisting with *D. polymorpha*, a dreissenid species common in the Lagoon.

Genetic assays based on DNA sequences of two mitochondrial genes (*cox1* and *cytb*) confirmed the genetic distinctness of the new species, relative to *D. polymorpha*. Genetic differences between the two dreissenid species in the Szczecin Lagoon amounted to 16 and 22% for *cox1* and *cytb*, respectively. The *cox1* DNA sequences showed no genetic differentiation between the *D. rostriformis begensis* individuals sampled, the haplotype – as analysed by BLAST – showing a 100% similarity to sequences of individuals from the Black Sea (GenBank Accession No. DQ840132), Ukraine (AF495877), Russia (AF510504), Hungary (JQ771943), France (JX945980), and the US (U47651). The remaining sequences of the species, derived from, e.g., the Caspian Sea (DQ840133) and the US (U47650) showed a difference not exceeding 1%. Genetic differentiation of the quagga mussel individuals' *cytb* gene amounted to 0.3%, contributed by two haplotypes identified. The Polish haplotypes were compared, using BLAST, with relevant sequences available in GenBank and showed a 99-100% similarity.

# First record of the spiny-cheek crayfish *Orconectes limosus* (Rafinesque, 1817) in Bulgaria

Milcho TODOROV[1], Teodora TRICHKOVA[1],
Pavel JURAJDA[2], Zdravko HUBENOV[3]

[1]Institute of Biodiversity and Ecosystem Research, Bulgarian Academy of Sciences, 1 Tsar Osvoboditel Bvld., Sofia 1000, Bulgaria; e-mails: todorovmilcho@gmail.com; trichkova@zoology.bas.bg
[2]Institute of Vertebrate Biology, Academy of Sciences of the Czech Republic, 8 Květná Str., Brno 603 65, Czech Republic; e-mail: jurajda@brno.cas.cz
3National Museum of Natural History, Bulgarian Academy of Sciences, 1 Tsar Osvoboditel Bvld., Sofia 1000, Bulgaria; e-mail: zhubenov@nmnhs.com

**Key words:** *Orconectes limosus*, invasive species, Bulgaria, Danube tributaries.

The spiny-cheek crayfish *Orconectes limosus* (Rafinesque, 1817) originates in North America. In Europe, the species was first introduced into Germany in 1890 and have since spread to at least 22 European countries. In the Danube River basin, the species has been reported from Germany, Austria, Hungary, Serbia, Slovakia, Croatia, and Romania. The spiny-cheek crayfish has been recorded in the main Danube River channel, as well as in the Danube tributaries and adjacent water basins, such as the Tisza River, the Drava River, and the Tamiš River.

In June 2015, the spiny-cheek crayfish was recorded for the first time in Bulgaria. Fourteen specimens (8♀ and 6♂) were caught in the Topolovets River, tributary of the Danube River, near the town of Vidin (N 43.941306; E 22.838611), on 17.06.2015. In August 2015, a second survey was conducted in the Danube River and the Danube tributaries in northwestern Bulgaria, and the species was found in three tributaries out of seven sampled, while it was not found in the Danube River main channel. As a result of both surveys, a total of 71 (33♂ and 38♀) specimens were caught at six sites: 31 specimens at four sites in the Topolovets River, 6 specimens at one site in the Voinishka River, and 34 specimens at one site in the Archar River. The highest population density was recorded in the Archar River (downstream the village of Archar). The total length of specimens ranged from 40 to 81 mm, 75% of them being with a length from 40-55 mm, and only 3 specimens being over 70 mm. The comparatively small sizes of the specimens recorded and the fact that the species was found only in the rivers' lower reaches (the most distant site being 8 km upstream of the Danube River confluence) may indicate an early stage of establishment of the species in the Bulgarian sector of the Danube River.

The spiny-cheek crayfish have been reported to decrease the indigenous crayfish populations in Europe through competition for resources and by acting as a vector for crayfish plague. Urgent measures need to be undertaken at national and regional level to prevent the spread of the species upstream of the Danube River tributaries and the inland waters of Bulgaria.

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51/30.06.2015, and IBBIS, D-33-72/20.07.2015, and under a bilateral cooperation project between the Bulgarian Academy of Sciences and the Academy of Sciences of the Czech Republic.

# Plants extract for biological control of the invasive species *Locusta migratoria*

Fatma Fatma ACHEUK[1], Bahia DOUMANDJI-MITICHE[2], Wassima LAKHDARI[3]

[1]University of Boumerdes, Faculty of Sciences, Department of Biology, Valcore Laboratory, Boumerdes, 35000, Algeria, email: fatma.acheuk@yahoo.fr
[2]Department of Zoology, National Institute of Agronomy Algiers, 16000, Algeria
[3]National Institute of Agricultural Research , Station of Sidi Mehdi, Touggourt,, Algeria

**Keywords: Plants** extract, *Pergularia tomentosa, Locusta migratoria,* biological control.

The migratory locust *Locusta migratoria,* in its various gregarious forms, is the most important crop pests in Africa and Asia. Like the desert locust: *Schistocerca gregaria*, *L. migratoria* is characterized by the pronounced ability to exhibit a continuum of forms between the extreme solitary and gregarious phases. In the gregarious phase, the single swarm can comprise many millions of locusts, and be more than 100 km long and several km wide. In this phase, the migratory locust cause substantial damage to crops and grazing. The control of grasshoppers and locusts has been based exclusively on chemical insecticides.

In an effort to identify novel pest-control products that are both environmentally acceptable and effective for the management of the migratory locust, *L. migratoria*, we assessed the effects of a crude extract of alkaloids from the aerial part of the plant *Pergularia tomentosa* (Asclepiadaceae) on growth and development of the fifth instar larvae of the migratory locust. This plant is common in the arid regions of Algeria, where it escapes feeding damage by *L. migratoria*. Newly emerged fifth instar larvae were treated by forced ingestion. Results showed that the test compound exhibited a considerable larvicidal effect with a dose-dependent mortality. On the other hand, it also caused antifeeding effect, weight loss of larvae with a reduction in protein and carbohydrate contents of hemolymph. These results indicated that *P. tomentosa* may be a promising naturally occurring agent for locust larval control.

# Effect of plant extract *Peganum harmala* against the whitefly, *Bemisia tabaci* (Homoptera: Aleyrodidae), at Doucen, Biskra Oasis, Algeria

Nacer TARAI

Agronomy, Université Mohamed Khider, Biskra, Algeria, e-mail: tarainacer@yahoo.fr

**Key words:** greenhouse – Oasis- Biskra- Doucen- whitefly-tomato- plant extract

To minimize the side effect of chemical use against pests in greenhouses, a survey was conducted at Doucen, Oasis of Biskra, by applying plant extract of *Peganum harmala* (Zygophyllaceae) against the whitefly *Bemisia tabaci* (Homoptera: Aleyrodidae), one of the most devastating pests on tomato crops in greenhouses. Extracts were sprayed on the first, the second and the sixth day. Three different extracts were used; seed extract, oil extract from the seed and extract from dry leaves, with three concentrations (0.25, 0.5, 1.0 ml/ml). Extracts were tested on different larval stages and on adults under laboratory or field conditions, during the autumn and winter period of the year 2014. Results showed that the mortality level increased with increasing extract concentration, especially on the first and second larval stages. The high cumulative level of adult mortality was found 72 hours after oil extract treatment, with 96% adults mortality under laboratory conditions and 72% adults mortality under greenhouse conditions.

# Using four types of trapping for the study of population dynamics of *Tuta absoluta* (Meyrick, 1917) (Lepidoptera: Gelechiidae).

Abdelmadjid BENZEHRA, Fouzia SELMANE, Lounes SAHRAOUI

National Higher Agronomic School El-Harrach,Algiers, Algeria, a.benzara@gmail.com

**Keywords:** *Tuta absoluta*, tomato, trapping, population dynamics, infestation.

In Algeria, *Tuta absoluta* is currently considered a major pest of tomato. It has a high potential for proliferation and destruction, its lightning damage can go up to 80-100%. To assess the risk of attack and monitor the pest, it has been used 4 types of traps: Delta, Tuta Roll, water and light. The latter two are the most efficient and effectiveness increases progressively with time. Delta traps and Tuta Roll are the least effective. The southern orientation allows better catches. Three generations occur between February and July. First appeared 10 days after transplanting tomato. The infestation of the leaves of the tomato is in the month of April and it increases during the spring and summer. The estimated damage to sheet amounted to 34.25% and fruits are negligible.

# Labratory bioassay of five doses of Deltamethrin on 2nd instar larvae of *Tuta absoluta* using dropping method

Behzad SADEGHI[1], Leila DUSTI[1], Azim NEMATI[1]

Department of Plant Protection, College of Agriculture, Bu–Ali Sina University, Hamedan, Iran, ssadeghi.behzad@yahoo.com; dusti_leila@yahoo.com; azim.nemati@gmail.com

**Key words:** Bioassay, Deltamethrin, Dropping method, *Tuta absoluta*

Tomato leaf miner *Tuta absoluta* (Meyrick) is present throughout the crop duration that is rapidly expanding around the world. Larvae can infest leaves, flowers, stem and fruits that causing important losses in tomatoes. Deltamethrin is an insecticide that is more frequently used in the control of microlepidoptera insect pests such as *T. absoluta*. So, this study was carried out to evaluate the efficiency of toxicity delthamethrin against tomato leaf miner on larvae 2 star under greenhouse conditions. In this study for bioassay tests, larvae 2 star of leaf miner were treated with five concentrations of delthamethrin (0.1 to 1.4 mg/ml) insecticide by dropping method. For preparation of stock solution, 20 to 280 mg of delthamethrin make up with 200 ml acetone. Based on results, 1.4 mg/ml of delthamethrin had the highest mortality (20-80%) on larvae 2 star of leaf miner. Regarding to calculated concentrations in this study, there is possibility of resistance to delthamethrin. Thus resistance tests leaf miner to delthamethrin should be done.

# Ecological study of *Tuta absoluta* (Lepidoptera, Gelechiidae) at Tolga, Biskra Oasis, Algeria

Nacer TARAI, Azeddine HADDAD

Agronomy Department, Mohamed Khider University, Biskra.

**Key words:** *Tuta absoluta*, tomato, Tolga, traps, sexual pheromone, greenhouse.

A survey on the *Tutta absoluta* (Lepidoptera, Gelechiidae), newly introduced in the oasis of Biskra, on the culture of the tomato in greenhouse at Doucen, Biskra oasis was made. This culture represents more than 45% of the national production in market culture.

This survey is based on the installation of the traps Tutasan to sexual pheromone Pherodis to 35 greenhouses installed according to the direction, North - South - Est - West.

The highest percentage of the captured male adults is recorded during the end of March 2014, whereas the weakest percentage is recorded during November

To shortcoming this survey, we mentioned the attacks and damages as well as the natural enemies found accidentally on the culture of tomato during the sampling period.

# Effect of covering dates bunchs on phytosanitary aspect of dates in the context of fight against *Ectomyelois ceratoniae* Zeller in Ouargla region

Keltoum KRID[1] , Souad BABAHANI[1, 2], Mohamed Azzidine IDDER[1]

[1]Research Laboratory on Phœniciculture (Phoenix). University KASDI Merbah. Ouargla no. 30000, Algeria. keltoumkrid@yahoo.fr
[2]Laboratory for Saharan Bioresources. University KASDI Merbah, Ouargla no. 30000, Algeria.

**Key words:** deglet Nour, *Ectomyelois ceratoniae*, bagging, ouargla, toilet.

Moth date (*Ectomyelois ceratoniae* Zeller) is one of the main pests of the date palm in Algeria. The study is held in Ouargla region to assess the effects of the physical protection of bunches and the toilet of the trees of Deglet Nour variety on the reduction rate of infestation by *E.ceratoniae*. For this purpose, the impact of each operation was tested before hand, and then their double effect was compared to a control. The statistical analyses of data (ANOVAs) rates of infestation of the different treatments shows a highly significant difference (P = 0.024) between dates of the control trees (no bagging and grooming), toilets trees (without bagging) and those dates of the bunches bagged (without and with grooming) with respectively the averages of 7.7%; 5 % ; 7.50% and 16%. Strong infestation rates, recorded at the level of protected bunches are primarily due to the hot and humid microclimate offered by polyethylene. Indeed, the study area is characterized by a hot and dry climate in summer. The yellow color of this protective material attracts moths. This result was confirmed by the bibliography which reported that the yellow and white polyethylene bags are attractive for Lepidoptera. Concerning the evolution of infestation rates according to the dates of sampling (from August to November), analyses of variance indicated a highly significant difference for each treatment depending on time (P= 0 ,000), We recorded a gradual increase in attacks of *E. ceratoniae* on dates of the first sampling until the end of the test date. Being given the low rates of infestation and the records of the dates, it can be concluded that the operation of the toilet of the date palms is sufficient to reduce attacks of *Ectomyelois ceratoniae* in the study area.

# Effect of cultural practices (irrigation and maintenance phoenicicole orchard) on date infestation rate by *Ectomyelois ceratoniae* Zeller (Lepidoptera: Pyralidae) in the region of Ouargla (South-East Algeria)

Fatma Zohra HAMMOUYA, Mohamed Azzidine IDDER,
Omar GUEZOUL, Keltoum KRID

Research Laboratory on Phœniciculture (Phoenix)., KASDI Merbah University, Ouargla, 30000, Algérie, E- mail : hammouya.fatima@gmail.com

**Key words:** maintained, infestation, irrigation, palm, *Ectomyelois ceratoniae* Z.

Carobe mothe (*Ectomyelois ceratoniae Z.*) is currently considered the most serious pest of dates in Algerian palm groves. Prospecting outputs are conducted in 60 sites in the area of Ouargla (Southern Algeria) which aims to know the effect of the main cultivation techniques achieve in yards phoenicicole on date infestation rate *E. ceratoniae Z.* among the variety; Deglet Nour date samples were collected from 11 plots representing the palm groves of the study area.

The ANOVA performed on the infestation levels showed a highly significant difference (P = 0.006), comparing the average infection rates for the eleven plots shows four groups (categories): the first category includes the parcel (HBA2) the most infested (t% = 17.03%); it is laid in which dates are a storage place with a lack of maintenance, irrigation is by sprinkler and a late harvest. The second category represents the plots (HBA1, KSR1, CH1, NGS3 KSR2) moderately infested with 12.96% infection rate, 12.96%, 12.59%, 12.56% and 11.87%; they have new Verges phoenicicole poorly maintained, characterized by excessive irrigation and a late harvest. The third category is the old and new maintained plots (abd1, NGS2, NGS1, CH2) in which harvesting is late and irrigation is by submersion and controlled because of the use of a collective feed, these Vergés phoenicicole have a rate equal to 11.11% infestation, 8.52%, 8.25% and 8.25%. In the latter category we find an old maintained plot (MKM) characterized by a total lack of irrigation during the year of experimentation and adding a sandy inputs; this plot has the lowest infection rate equal to 5.93%. Dates harvested from that laid phoenicicole are very dry (moth repellent for dates).

# Changes in ichthyofauna of the north-western Bulgarian stretch of the River Danube – preliminary results

Teodora TRICHKOVA[2], Pavel JURAJDA[1], Milcho TODOROV[2], Ivan BOTEV[2], Markéta ONDRAČKOVÁ[1], Veronika MICHÁLKOVÁ[1]

[1] Institute of Vertebrate Biology, Academy of Sciences of the Czech Republic, Květná 8, Brno 603 65, Czech Republic; E-mail: jurajda@brno.cas.cz
[2] Institute of Biodiversity and Ecosystem Research, Bulgarian Academy of Sciences, 1 Tsar Osboboditel Blvd., Sofia 1000, Bulgaria; E-mail: trichkova@zoology.bas.bg

**Key words:** native fish species, alien fish species, River Danube, distribution, abundance.

The River Danube provides a range of important services, including transportation, power generation, sanitation, drinking water, food (fisheries) and tourism. As a result, it has undergone significant changes due to channelisation, damming and pollution. The Danube has also become an important corridor for the introduction and spread of alien aquatic species, often leading to changes in biodiversity, food webs and ecosystem services.

We monitored the shoreline ichthyofauna of the northwestern Bulgarian stretch (840 to 765 rkm) of the Danube at 10 sites between 2012 and 2013 (three sites in September 2012 and 2013, nine sites in August 2014) using beach seines and electrofishing. We then compared this data with those from a previous study covering 2005-2006 (Polačik et al. 2008) in order to assess any short-term changes in fish species composition. Thirty fish species were recorded in 2012-2014, of which six were alien species (*Carassius gibelio*, *Hypophthalmichthys molitrix*, *Pseudorasbora parva*, *Syngnathus abaster*, *Lepomis gibbosus* and *Perccottus glenii*). Most frequently found in all sites were *Alburnus alburnus*, *Neogobius fluviatilis* and *S. abaster*, with *A. alburnus* followed by *Rhodeus amarus*, *Neogobius melanostomus*, *Carassius gibelio* and *Blicca bjoerkna* the most abundant species. Our preliminary results indicate no significant change in fish composition between the two sampling periods, though the relative frequency and abundance of some species has increased (e.g. *S. abaster*). There was no increase in the number of alien species over the same period. Annual differences in fish composition could be explained through localised changes in the hydrological regime of the main channel and floodplain waterbodies.

The study was funded through the 'Financial Mechanism of the European Economic Area 2009-2014', BG03 Biodiversity and Ecosystem Services, the ESENIAS-TOOLS project No. D-33-51/30.06.2015 and through bilateral cooperation between the Bulgarian Academy of Sciences and the Academy of Sciences of the Czech Republic.

**Reference:**

POLAČIK, M., T. TRICHKOVA, M. JANÁČ, M. VASSILEV, P. JURAJDA, 2008 - The ichthyofauna of the shoreline zone in the longitudinal profile of the Danube River, Bulgaria. Acta zoologica bulgarica, 60 (1): 77-88.

# Non-native fish *Lepomis gibbosus* as a source of introduced parasites and/or reservoir for local parasites in European water bodies

Markéta ONDRAČKOVÁ[1], Teodora TRICHKOVA[2], Veronika NEZHYBOVÁ[1], Iurii KVACH[1], Pavel JURAJDA[1]

[1]Institute of Vertebrate Biology ASCR, v.v.i., Brno, Květná 8, 60365 Brno, Czech Republic; audrey@sci.muni.cz
[2]Institute of Biodiversity and Ecosystem Research, Bulgarian Academy of Sciences, 1 Tsar Osvoboditel Blvd., Sofia 1000, Bulgaria

**Key words:** pumpiknseed sunfish, parasite, introduction, Ancyrocephalidae, *Posthodiplostomum*

After the introduction into new environments an introduced host species may lose some of its parasites or acquire parasites from the new environment. In relation to the local ecosystem, non-native species can also serve as a reservoir for one or several pathogen species already present in the area and, importantly, non-native species may also transport new parasite species that can invade native host populations. We used a host-parasite system including parasites and their non-native fish host species, *Lepomis gibbosus* (Centrarchidae), introduced from North America over a hundred years ago to Europe.

Thirteen populations of *L. gibbosus* were investigated for metazoan parasites in four drainages in Europe: Black Sea, Aegean Sea, Mediterranean and North Sea drainage. Co-introduction of seven monogenean species (*Gyrodactylus macrochiri*, *Onchocleidus acer, O. dispar, O. similis, Actinocleidus oculatus, A. recurvatus, Cleidodiscus robustus*) and one digenean species (*Posthodiplostomum* cf. *minimum*) was documented. Abundance and species richness of monogenean parasites decreased along the latitudinal gradient from the south to the north. Metacercariae of *P.* cf. *minimum* were observed at four different sites in the Danube River basin in Bulgaria and the Czech Republic. Whilst transmission of monogenean parasites to local fauna is not expected due to their high specificity level, using local fish species as suitable host for *P.* cf. *minimum* remains a question. Molecular analyses, performed previously for this species complex in its native range, indicated that also *P.* cf. *minimum* shows high level of specificity. However, the affiliation of the parasites collected in Europe to particular species within the species complex has to be confirmed by further genetic analyses.

The susceptibility of non-native *L. gibbosus* to the local fauna resulted in relatively high abundance of metacercariae of *Diplostomum* spp. and *Tylodelphys clavata* at few sites in the Danube and Elbe basins. Ergasilid copepods were observed to parasitise this fish species at almost all sites, mainly with medium abundances. However, due to relatively low fish density at particular sites, their importance as reservoir for either diplostomid trematodes or ergasilid copepods is not expected to be high. Other parasite species (e.g. larval cestode *Valipora campylancristrota*, larval nematodes *Contracoecum* sp., *Spiroxys contortus* or *Raphidascaris acus*) occurred rather rarely in parasite communities of *L. gibbosus*.

The study has been partly funded within a bilateral cooperation project between the Bulgarian Academy of Sciences and the Academy of Sciences of the Czech Republic.

# Characteristics of reproductive system in adult females of *Pseudorasbora parva* (Temminck et Schlegel, 1848) in various types of water bodies from the Republic of Moldova

Nina FULGA, Ion TODERAŞ

Institute of Zoology, Academy of Moldova, Chisinau, Fulganina @ yahoo.com

**Key words:** oocyte, gonads, resorption, gonadosomatic index, spawning.

In Moldova *Pseudorasbora parva* inhabit in small lives well-warmed and slowly flowing waters of the Prut and the Nistru river basins, such as the rivers Bic, Raut, Lopatna, as well as in the larger aquatic ecosystems, like Ghidighici Reservoir, the lower course of Nistru and Prut rivers.

In our studies, we used mature females of *Pseudorasbora parva*, caught from Lopatna River and Beleu Lake, which are included in the basin of the Prut River. The biological analysis showed that the largest were two-year-old individuals from the river. The values of weight in these fish was significantly higher than that of individuals from the Beleu Lake ($P \geq 0,95$) and their linear indexes are not significantly different ($P \leq 0,95$).

In the conditions of these water basins the females of *Pseudorasbora parva* become sexually mature at one year of age and are a portioned spawning species. During the spawning season, the females lay three portions of eggs. Timing of fish spawning is very variable and can shift depending on the area they live. River fish begin to reproduce by the three weeks earlier the lake ones (in the third decade of April and in mid-May) respectively, which is determined by various temperature regime in the reservoirs. Upon completion by oocytes of trophoplasmatic growth the gonadosomatic index has a maximum value. At this stage of gonad development in river and lake fish, this index does not have significant differences ($P \leq 0,95$).

During the histological examination, in the midst of spawning in Beleu Lake, females with total resorption of oocytes in the final phase of the trophoplasmatic growth period have been identified. Destructive changes affect the proper oocyte shell around its whole perimeter, and there can be observed the homogenization of the yolk and increasing of cell size from follicular membrane. Such individuals are not able to participate in spawning and as a result, miss the spawning season in a given year.

# Preliminary checklist of alien mammal species in Bulgaria

Yordan KOSHEV[1], Nedko NEDYALKOV[2], Ivaylo RAYKOV[3]

[1]Institute of Biodiversity and Ecosystem Research, Bulgarian Academy of Science, 1 Tsar Osvoboditel Blvd., 1000 Sofia, Bulgaria; E-mail: bgsouslik@gmail.com
[2]National Museum of Natural History, Bulgarian Academy of Science, 1 Tsar Osvoboditel Blvd., 1000 Sofia, Bulgaria; E-mail: nnedko@gmail.com
[3]Museum of Natural History - Varna, 41 Maria Luiza Blvd., 9000 Varna, Bulgaria; E-mail: ivaylo.raykov@gmail.com

**Key words:** alien species, mammals, database, checklist, Bulgaria

There are no accurate data on the non-native mammalian species collected in Bulgaria up to date. Reliable information about the current status of species bred in captivity, semi-captivity or in the wild is missing as well. The compilation of an accurate database is rather difficult in respect of the following subjects: the classification and taxonomy of the species, their paleohistory, determination of the various non-native species, etc. There are not reliable data for the period before 1990, when many species of non-native mammals were introduced in Bulgaria, primarily for hunting and fur-farming, as precise information about the sites of placement, the origin and the number of the specimens, the success of the introduction, etc., is not available.

A review of the available data on the non-native mammal species in the scientific and popular literature was made. The main part of the non-native mammals consists of game species, such as *Dama dama*, *Bison bonasus*, *Capra ibex*, and *Ovis ammon*. There are also reports about the introduction of the American mink (*Mustela vison*), the coypu (*Myocastor coypus*), the raccoon dog (*Nyctereutes procyonoides*), and the muskrat (*Ondatra zibethicus*). Two rat species, the black rat (*Rattus rattus*) and brown rat (*Rattus norvegicus*), penetrated into Bulgaria in ancient times. Among the alien mammal species, the brown rat had the highest negative impact on the natural ecosystems and humans. There were also reports about the negative impact of the coypu, muskrat and raccoon dog. Keeping exotic mammals as pets in Bulgaria has become popular in recent years. Some of those animals have been released accidentally in nature as in the case of the American grey squirrel (*Sciurus carolinensis*).

The on-going introduction of the tarpan (*Equus ferus ferus*) into the wild is expected to have a positive impact on the grasslands in the targeted region.

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# *Rickettsia raoultii* in *Dermacentor marginatus* ticks collected on sheep, in Moldova

Alexandr MOROZOV[1*], Natalia SITNIKOVA[1*],
Alexandru MOVILA[1], Ion TODERAŞ[1], Sven POPPERT[2]

[1]Institute of Zoology of ASM, str. Academiei 1, MD-2009, Chisinau, Moldova, e-mails:izoolasm@yahoo.com, acarologMD@gmail.com
[2]Bernhard-Nocht-Institut für Tropenmedizin, Bernhard-Nocht-Straße 74, 20359 Hamburg, e-mail: bni@bnitm.de

**Key words:** ticks, sheeps, Dermacentor, Rickettsia, Moldova

Spotted fever group rickettsiae are gram-negative obligate intracellular bacteria responsible for emerging tick-borne diseases. The rickettsial life cycle involves vertebrate and invertebrate hosts. Ixodid ticks maintain rickettsiae in nature through transstagial and transovarial transmission, and the pathogens' distributions correspond with those of the tick vectors (Parola 2005). To better understand the distribution of tick-borne pathogens in Moldova, we collected *D. marginatus* ticks from sheep and tested them by polymerase chain reaction (PCR) for the presence of *Rickettsia spp.*

One farm located in Sadova village, Moldova, was included in the investigation (47.186334N, 28.340511E). Altitude of the study sites is 134 m above sea level.

Ninety-eight ticks were removed from 18 sheeps with tweezers from each animal at different body parts. All collected ticks were identified by standard taxonomic keys and transferred to 70% ethanol.

Eight *D. marginatus* of 98 investigated ticks resulted positive to gltA and ompB PCRs, showing a rickettsiae infection prevalence of 8.2%. Positive ticks were collected from 4 sheep of 18 animals (22.2%). Sequence analysis identified *Rickettsia raoultii* in all samples. Partial gene sequences showed a similarity of 100% compared with reference sequences from GenBank (*R. raoultii* ompB DQ365797) of obtained *Rickettsia* species cultivated from *Dermacentor* ticks collected in Russia.

**References:**

PAROLA, P., B. DAVOUST, D. RAOULT, 2005 - Tick- and fleaborne rickettsial emerging zoonoses. Vet. Res. 36: 469 - 492.

# Parasitofauna of some freshwater fishes in Jandara Lake

Lali MURVANIDZE, Ketevan NIKOLAISHVILI,
Tsitsino LOMIDZE, Lela ARABULI, Ketevan ASATIANI

Institute of Zoology, Ilia State University, Cholokashvili ave., 3/5. 0162 Tbilisi, Georgia, E-mail: lali.murvanidze@hotmail.com

**Key words:** parasitofauna, fish, Jandara Lake.

One of the most important issues for increase the productivity of fishery is to develop new methods of parasite control. Fish represent the main group of the Jandara Lake animals. The aims of provided investigation were to: 1) investigate parasitic fauna of the main industrial and other fishes of the lake; 2) provide comparative analyses of the parasitic fauna of separate fish species; 3) establish taxonomical structure of parasites; 4) outline species of parasites of medical importance.

Investigations were provided in summer and fall 2013 and spring 2015. The parasite fauna of fishes inhabiting Jandara Lake is presented by 11 species of parasitic protists and helminthes. 355 individuals of eight fish species were treated. 129 individuals (36.3%) of them appeared infected by: Ciliata – 2, Flagellata – 1, Sporozoa – 1, Monogenea – 3, Trematoda - 1, Cestoda – 1, Nematoda – 2. Invasion by protists and helminths made 19% and 81% respectively. Most species rich parasite fauna was found in *Carassius carassius* (seven species) and *Cyprinus carpio* (five species). The main industrial fish species of the lake (*Ctenopharyngodon idella, Cyprinus carpio*) appeared free from the parasites of medical importance. However, high percentage of infection of widely distributed fish species in the lake - *Carassius carassius* and finding of larval forms of Anizakidae (genus *Pseudoterranova*) in the Caucasian river goby (*Neogobius (Ponticola) constructor*) can further threaten industrial fish species and humans.

# Surprise necropsy findings: Parasitism in three species of captive reptiles

Raluca Ioana RIZAC[1], Dumitru MILITARU[2],
Claudia Mariana CONSTANTINESCU[1], Manuella MILITARU[1]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, Faculty of Veterinary Medicine, 105 Splaiul Independenţei, Sector 5, 050097, Bucharest, Romania. E-mail: raluca.rizac@yahoo.com
[2]Academy of Agricultural and Forestry Sciences "Gheorghe Ionescu-Şişeşti", Bvd. Mărăşti No. 61, Sector 1, 011464, Bucharest, Romania
University of Agronomic Sciences and Veterinary Medicine of Bucharest, Faculty of Biotechnologies, Bvd. Mărăşti No. 59, Sector 1, 011464, Bucharest, Romania

**Key words:** *Acanthosaura capra, Emys orbicularis, Vipera ammodytes,* parasitism.

Although in reptiles the parasites are rarely linked to morbidity or mortality, free ranging and captive reptiles can be infested with a wide variety of parasites.

Four adult reptiles – one Mountain Horned Dragon *(Acanthosaura capra)*, one European Pond Turtle (*Emys orbicularis)* and two Horned Vipers *(Vipera ammodytes)* – were submitted for postmortem diagnosis. The Mountain Horned Dragon exhibited bacterial interstitial pneumonia, hemorrhagic necrotizing enteritis, hepatic lipidosis, bone marrow with lymphoid depletion, and a pulmonary 10 mm segmented white parasite, attributable to *Linguatula* genus. The most relevant lesions observed in the European Pond Turtle were the multiple fractures of the carapace and plastron, with the subsequent liver rupture and lung perforation, and a cluster of *Spiroxys contortus* threaded into the gastric wall. The two Horned Vipers exhibited hepatic lipidosis, enteritis, renal gout, interstitial pneumonia, and a total of three parasites belonging to the *Filaroidea* superfamily in the subcutaneous area. No clinical signs associated to the parasitism were observed prior to death in any reptile. Except for the *Spiroxys* parasitism, which caused discrete ulceration of the gastric mucosa, the parasites encountered in the other reptile species caused no lesions.

The death of the reptiles was not due to the parasitism, but knowing that captive reptiles may develop such parasitic infestations with the help of intermediate hosts is of great importance.

# Postmortem incidental findings of endoparasites in dogs involved in motor vehicle car accidents

Andrei Constantin STOIAN, Raluca Ioana RIZAC,
Claudia Mariana CONSTANTINESCU, Emilia CIOBOTARU, Gabriel PREDOI

University of Agronomic Sciences and Veterinary Medicine of Bucharest, Faculty of Veterinary Medicine, 105 Splaiul Independenţei, District 5, 050097, Bucharest, Romania, E-mail: stoian_andrei1988@yahoo.com

**Key words:** *Dirofilaria*, *Toxocara*, mVA, dogs, Bucharest.

The incidental discovery of endoparasites in different animal species is quite common during necropsy examination. The identified parasitic species generated mild or major lesions, none of those being life-threatening or associated with cause of death. All the dogs included (n=28) in this study were diagnosed with multiple motor vehicle trauma (rib fractures causing pneumohemothorax, induced hemoperitoneum by liver and spleen ruptures). Endoparasitic species framed as roundworms were diagnosed in six dogs (21%). Adults of *Dirofilaria immitis (no=4*) coexisting with *Dirofilaria repens* (n=1) and *Toxocara canis (no=2*) were identified.

Dirofilariosis is a vector borne zoonotic disease mainly caused by *Dirofilaria immitis* and *D. repens*, filaroid species whose vectors are mosquito species and primary hosts are domestic and wild canines and felines. Pulmonary arteries, right heart ventricle, *cavum thoracis*, bronchi and other organs presented adults of *D. immitis*. In Romania, especially in Bucharest, increased incidence of heartworms in dogs was noticed in the last years. The gross findings in *D. immitis* parasitism was dominated by cardiopulmonary lesions such as right heart dilations and left heart hypertrophy, severe pulmonary oedema, thromboembolic parasitism in the pulmonary arteries and pulmonary infarcts. Occasionally, endocarditis, spleen and kidney congestion were revealed. *D. repens* was found in a dog with *D. immitis* parasitism, featured by subcutaneous nodules including adult nematodes.

*Toxocara canis* is a common parasite of the small intestine of dogs. Regarding the two cases of infestation with *T. canis*, gross lesions consisted in chronic catharal enteritis.

# Isolation and characterization of the first polymorphic microsatellite markers for the Roman snail, *Helix pomatia* L., 1758 (Gastropoda: Stylommatophora: Helicidae)

Ana-Maria KRAPAL, Oana Paula POPA, Larisa-Bianca DUMITRESCU, Elena Iulia IORGU, Alexandra Florina LEVĂRDĂ-POPA, Mihaela Isabela VADANA, Luis Ovidiu POPA

"Grigore Antipa" National Museum of Natural History, Şos. Kiseleff no. 1, 011341 Bucharest 2, Romania, e-mails: ana.krapal@antipa.ro, oppopa@antipa.ro, larisad@antipa.ro, elenap@antipa.ro, alexandra.florina@antipa.ro, mvadana@antipa.ro, popaluis@antipa.ro

**Key words:** *Helix pomatia*, microsatellite markers, threatened populations, population genetics.

The Roman snail, *Helix pomatia*, is a widely known gastropod species due to the fact that it is spread through all Central and Southern Europe. It is also one of the biggest land snail species, its shell reaching 4.5 cm. The species is extensively commercialized, being highly appreciated in the Mediterranean region. Although in Romania this species is quite abundant, in some other European Union countries (i.e. UK, Denmark, Czech Republic and Germany) the wild populations are rare and strictly protected by law.

The species has been analyzed extensively in terms of its biology and ecology, important for achieving optimal conditions necessary for successful rearing and reproduction of individuals in snail farms. Genetic studies are relatively new and do not focus exclusively on the analysis of this species, but related species in the genus Helix or the entire Helicidae family.

Analyzing the genetic diversity of the Roman snail in the wild can help in identifying threatened populations and in developing conservation plans for this species. Following this direction, we described 10 polymorphic microsatellite loci in this species. The variability of the 10 markers was tested in 24 individuals from a single population in Bucharest, Romania. We describe here preliminary data concerning the analyzed loci. They are polymorphic, with an allele number/ locus ranging between 2 and 13. The observed heterosigosity ranged from 0.25 and 0.73. Only one locus (LH50) showed a slight deviation from the Hardy-Weinberg equilibrium after the Bonferroni correction ($p=0.4$).

Population genetics studies can be a starting point in protecting the threatened populations/ subpopulations that can be identified using this type of molecular markers.

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# Reproductive cycle reflected in the structure of hepatopancreatic tubular cells of the narrow clawed crayfish, *Astacus leptodactylus* Eschscholtz, 1823

Ana-Maria PETRESCU[1,2], Otilia ZĂRNESCU[2]

[1]"Grigore Antipa" National Museum of Natural History, 1 Kiseleff Blvd, 011341 Bucharest, Romania, e-mail: anapetrescu@antipa.ro
[2]Department of Biochemistry and Molecular Biology, Faculty of Biology, University of Bucharest, 91-95 Splaiul Independenței, 050095 Bucharest, Romania, e-mail: otilia.zarnescu@bio.unibuc.ro

**Key words:** crayfish, reproductive cycle, hepatopancreas, structure

Hepatopancreas represents an important metabolic center of synthesis and storage of important organic reserves in the physiological processes. The cellular types of *Astacus leptodactylus* hepatopancreas had been characterised by their enzymatic activity, with no correlation with the female gonadal development.

The main purpose of this study is the correlative approach between the monthly structure of hepatopancreatic cells and the main events in the ovarian developmental cycle. Structural and morphometrical analysis were performed to offer a better understanding of this relationship.

Fragments of ovary and hepatopancreas were fixed in Bouin solution, dehydrated in ethanol, cleared in toluene and embedded in paraffin. The tissue sections were stained with Hematoxylin and Eosin for general morphology, Alcian blue for acid mucopolysaccharides, Periodic Acid Schiff for neutral mucopolysaccharides and Oil Red O for lipid detection. Indirect immunoperoxidase technique was performed on hepatopancreas sections to identify certain proteins.

During the entire reproductive cycle we have observed four main types of tubules: first type with only one cell type, the undiferentiated type (E cells, undifferentiated), second type, RF type (represented by absorbtive and fibrillar cells), third type, B type (consisting mainly in blister cells), and fourth type, subtype B (B cells are predominant in tubuli with circular lumen). The structure of this tubules and their proportion changes with the reproductive cycle. The I$^{st}$ type is more abundant during the mature stage, the II$^{nd}$ type is more abundant during the maturing stage, the III$^{rd}$ type is more abundant in the resorptive stage and the IV$^{th}$ type, during the resorptive and imature stages.

The results of this study demonstrate a seasonal dependence between different cellular types of the hepatopancreas and the stages of the oogenesis. The understanding of the functional cellular biology of this species is usefull in evaluating the population integrity in the context of increased habitat fragmentation.

# Species accounts for Orthoptera (Insecta) of community interest in Romania

Ionuț Ștefan IORGU, Elena Iulia IORGU

"Grigore Antipa" National Museum of Natural History, 1 Kiseleff Str., 011341 Bucharest 1, Romania, e-mails: ionut.iorgu@antipa.ro, elenap@antipa.ro

**Key words:** Habitats Directive, Orthoptera, Romania.

Seven bush-cricket and grasshopper species listed in Annex II and one species in Annex IV of the Habitats Directive - Council Directive 92/43/EEC 1992 are present in Romanian fauna, with unclear and sometimes contradictory data on their geographical range. Such information is fundamental for maintenance of a favorable conservation status for the species *Isophya costata* Brunner von Wattenwyl, *Isophya harzi* Kis, *Isophya stysi* Cejchan, *Pholidoptera transsylvanica* (Fischer), *Paracaloptenus caloptenoides* (Brunner von Wattenwyl), *Odontopodisma rubripes* Ramme, *Stenobothrus eurasius* Zubovski (Annex II) and *Saga pedo* Pallas (Annex IV) and is discussed in the present work.

Regarding its taxonomy, genus *Isophya* is one of the most problematic of European Orthoptera, their morphological similarity making identification of species very difficult; so, the most important instrument for a correct identification is the male calling song analysis. The same methodology should be used also when monitoring the other two stridulating species, *Pholidoptera transsylvanica* and *Stenobothrus eurasius*. Among the three *Isophya* species, *I. stysi* has the largest distribution area, from the western part of the country, central and southwestern Transylvania, reaching western Moldavia through the central area of the Eastern Carpathians. *I harzi* is known only from Cozia Mountains; *I. costata* occurs in south-western Transylvania and along Mureș valley towards Hungary. The Carpathian endemic *P. transsylvanica* is one of the most common species in the Romanian mountains, living up to 2.300 m altitude. *O. rubripes* populates mesophytic meadows, preferably with *Rubus* bushes, in central and northwestern Romania. *S. pedo*, *P. caloptenoides* and *S. eurasius* have patchy distributions: *Saga* is distributed all over Romania, *Paracaloptenus* is known to occur in several southwestern and eastern areas of the country, and *Stenobothrus* being previously reported only from northwestern Romania.

In order to develop up-to-date conservation strategies, key biological and ecological information are needed for the actual distribution area, population trends, habitat suitability and survival perspectives for these eight species of European Importance, correcting the actual rather data deficient management programmes.

# Biodiversity of Orthoptera in Sebkhet Bazer Sakhra (Setif, Algeria)

Zina SOFRANE[1], Salaheddine DOUMANDJI[2]

[1] Department of Animal Biology and Physiology, Faculty of Natural and Life Sciences, Ferhat Abbes Setif1 University, El-Bez, 19000 Algeria; sofranezina1@yahoo.fr
[2] Research Laboratory of Plant Protection, Zoology, National Higher School of Agronomy, Avenue Hassan Badi, El- Harrach, 16200 Algeria; dmndjislhdn@yahoo.fr

**Key words:** locusts, grasshoppers, katydids sebkha, Setif, Algeria.

With the aim of knowing the biodiversity of Orthoptera species in Sabkhats, we made a study to Bazer Sakhra which is a permanent natural depression closed and semi arid climate. It is classified among the protected areas in Algeria under the Ramsar convention. The prospecting was carried out for two years. In this site, the total species richness was 18 species belonging to 14 genera (*Paratettix, Pyrgomorpha, Calliptamus, Aiolopus, Dociostaurus, Omocestus, Acrotylus, Oedipoda, Sphingonotus, Thalpomena, Miocertus, Thisoicetrus*) and two families (Acrididae and pyrgomorphidae) and seven subfamilies (Acrydiinae, Pyrgomorphinae, calliptaminae, acridinae, Gomphocerinae, Oedipodinae and Eyprepocnemidinae).

The subfamily Oedipodinae is the most frequent from the point of view species. It includes 50% of the species inventoried. The classification of relative abundances of species inventoried Orthoptera revealed 5 dominant species with 72.79%, 7 Influential species with 21.33% and 6 resident species with 5.88%. The analysis of the constancy showed that the majority of Caelifera was little accidental and 7 were accessories. The diversity index (H) was 3.38 bits. Three types of distribution were indicated, regular, contagious and uniform. Whereas katydids were completely absent. The summer period turns out the best period that marked most of occurring species, while the winter was the bad season of species of Orthoptera.

# Mapping the general distribution of *Isophya camptoxypha* species group (Insecta: Orthoptera) in the Romanian Carpathians and application of IUCN Red List criteria for their future conservation

Ionuț Ștefan IORGU, Tiberiu Constantin SAHLEAN, Liviu Aurel MOSCALIUC, Mirela DRAGOȘ, Elena Iulia IORGU

"Grigore Antipa" National Museum of Natural History, 1 Kiseleff Str., 011341 Bucharest 1, Romania, e-mails: ionut.iorgu@antipa.ro, tiberiu.sahlean@antipa.ro, liviu.moscaliuc@antipa.ro, mirela.dragos@antipa.ro, elenap@antipa.ro

**Key words:** *Isophya*, distribution, Romania, IUCN Red List, extent of occurrence, area of occupancy.

*Isophya* Brunner von Wattenwyl is one of the most diverse bush-cricket genera in the Palearctic and probably the most problematic regarding its species-level taxonomy. The identification of sympatric *Isophya* species is difficult, if not impossible, as these insects do not possess internal sclerotized male genital organs and elaborated shape of cerci and tegminae. Contrary to this morphological uniformity, the rhythmic structures of male song are diverse and species-specific, acoustic communication playing an important role in the mate recognition system of these insects.

Based on basic morphological features and acoustic signals of several related species, Szövényi et al. (2012) define "*Isophya camptoxypha*" species-group as a complex consisting of five species: *Isophya camptoxypha* (Fieber); *I. ciucasi* Iorgu & Iorgu; *I. nagyi* Szövényi, Puskás & Orci; *I. posthumoidalis* Bazyluk and *I. sicula* Orci, Szövényi & Nagy. Recently described from the Romanian Eastern Carpathians, *Isophya dochia* Iorgu is similar in morphology and song type with these species and should be added to group. Four of these species (*Isophya ciucasi*, *I. dochia*, *I. sicula* and *I. nagyi*) are localized endemits that survived at least the last glaciation in situ, having limited geographic dispersal restricted to some mountainous regions of the Carpathians.

Assessment of all European orthopteran species for the IUCN Red List of Threatened Species started in 2011 and recently the Orthoptera species present in the Carpathian orographic units were evaluated according to these criteria; 141 species were classified to the following categories: Critically Endangered, Endangered, Vulnerable, Near Threatened, Least Concern and Data Deficient (Krištín & Iorgu, 2014).

Some of the *Isophya camptoxypha* species-group were evaluated back then as Endangered (*I. ciucasi*, *I. nagyi*), Vulnerable (*I. dochia*, *I. sicula*) or Least Concern (*I. posthumoidalis*). After the review of species' Extent of Occurrence (EOO), Area of Occupancy (AOO), number of locations and habitat quality according to our improved data, we propose some changes in their assessments: *Isophya camptoxypha* - Lower Risk (least concern), *I. ciucasi* - Endangered (B1a + b iii, B2a + b iii), *I. dochia* - Vulnerable (B1a + b iii, B2a + b iii), *I. nagyi*

- Vulnerable (B1a + b iii, B2a + b iii), *I. sicula* - Endangered (B2a + b iii), *I. posthumoidalis* - Lower Risk (near threatened).

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# Beetles included in the "Red Book" of the Republic of Moldova

Elena BABAN[1], Svetlana BACAL[1,2], Livia CALESTRU[1], Irina MIHAILOV[1]

[1]Institute of Zoology of the ASM, str. Academiei, 1, MD- 2028, Chisinau, Republic of Moldova, e-mail: ilenuta2003@yahoo.com; lcalestru@yahoo.com; irinus1982@yahoo.com
[2]Institute of Ecology and Geography of the ASM, str. Academiei, 1 Chisinau Republic of Moldova, e-mail: svetabacal@yahoo.com

**Key words:** the Red Book, beetles, rare species, protection.

The excessive capitalization of agricultural land, irrational managing of forests, damaging of steppes, led to pollution of soil and water reservoirs. All this had a negative impact on the diversity and numbers of animal and plant species. In addition, it was observed a decrease of the resistance and reproduction capacities of sensitive and vulnerable species and even the disappearance of some of them.

Republic of Moldova has signed several international and national documents pledging to contribute to the protection and restoration of local flora and fauna. In this context, the Red Book of Moldova is a strategic document that not only specifies the species that are vulnerable or in a critical condition, but also proposes concrete measures of protection and restoration of rare species.

Beetles are a group of insects that, along with other groups of organisms, are very sensitive to changes in their natural environments. The first edition of the Red Book, published in 1978, included 29 animal species, but beetles are not mentioned. The second edition was published in 2002 comprising 116 species, including 11 species of beetles. The third edition included 213 species, of which 25 beetles from 9 families: Carabidae - 8 species, Staphylinidae - a species, Lucanidae - a species, Scarabaeidae - 3, Cetoniidae - a species, Elateridae - 3, Cerophytidae - a species, Cucujidae - a species, and Cerambycidae - 6 species. Multiannual observations of Beetles revealed the growing vulnerability of species to climate change and human impact.

We believe that in order to reduce biodiversity loss and facilitate the return of species of beetles that are in a critical ecological condition, comprehensive measures are needed to protect the habitats of these species by stopping, primarily, the fragmentation of natural ecosystems, wood extraction, mowing, illegal grazing, and by reducing the application of chemical treatment and biological methods for the protection of plants.

# Haplotype diversity in some populations of *Lucanus cervus* from Romania - preliminary data

Alexandra Florina LEVĂRDĂ-POPA, Elena Iulia IORGU, Oana Paula POPA, Larisa-Bianca DUMITRESCU, Ana-Maria KRAPAL, Mihaela Isabela VADANA, Andreea Cătălina DRĂGHICI, Luis Ovidiu POPA

[1]"Grigore Antipa" National Museum of Natural History, Şos. Kiseleff no. 1, 011341 Bucharest 2, Romania, e-mails: alexandra.levarda@antipa.ro; elenap@antipa.ro; oppopa@antipa.ro; larisad@antipa.ro; ana.krapal@antipa.ro mvadana@antipa.ro; andreea.draghici@antipa.ro; popaluis@antipa.ro

**Key words:** COI gene, haplotype, genetic diversity

The saproxylic stag beetle *Lucanus cervus* (Linnaeus, 1758) is one of the largest beetle species in Europe (Luce, 1996), where it is widely spread. The European distribution of *L. cervus* is considered to be represented by metapopulations (i.e. a collection of local populations connected by dispersal). *L. cervus* is of major conservation interest, being listed in Annex II of Habitat Directive and protected by Romanian legislation.

In the present study, we investigated the genetic diversity in a fragment of 636 bp of the COI gene in 16 specimens of *L. cervus* belonging to 6 populations from Romania. Phylogenetic analyses revealed a high genetic diversity between the samples, with a total of 11 haplotypes. There are 2 haplogroups and 2 intermediate haplotypes (H9, H11). We have identified 74 mutated positions between the most extreme haplotypes from the 2 haplogroups. This genetic diversity pattern is characterized by pronounced phylogenetic gaps between sequences. The first haplogroup includes 4 haplotypes (H3, H4, H8, H10) from 2 populations (Comana, Giurgiu County and Giroc, Timiş). The second haplogroup has 5 haplotypes (H1, H2, H5, H6, H7) from samples in 4 populations (Buciumeni, Galaţi County, Giroc, Timiş County, Dubova, Mehedinţi County, Perişoru, Dolj County).

These phylogeographic patterns found in the analyzed samples might reflect admixture of individuals from allopatrically diverged sources.

The phylogenetic studies of a single molecular marker reflect only the evolution of that particular gene, a fact that could lead to problems in interpretation. For this purpose, further analyses will involve the study of multiple independent genes (mitochondrial and nuclear) to get more accurate data about the evolutionary status of this species.

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# Molecular diversity of honeybee *Apis mellifera sahariensis* (Hymenoptera: Apidae) from southern Algeria

Nora CHAHBAR[1], Irene MUNOZ[2], Pilar de la RUA[2], José SERRANO[2], Salaheddine DOUMANDJI[3]

[1]Département de Biologie, Faculté des sciences, Université M'hamed Bougara Boumerdes, 35 000 Avenue de l'indépendance, Algérie, e-mail: chahbar_nora@yahoo.fr
[2]Área de Biología Animal, Dpto. de Zoología y Antropología Física, Facultad de Veterinaria, Universidad de Murcia, 30100 Murcia, Spain
[3]Département de Zoologie Agricole et Forestière, Ecole Nationale Supérieure Agronomique d'El-Harrach.

**Key words:** *Apis mellifera sahariensis*, *Apis mellifera intermissa*, Mitocondrial DNA, Microsatellite DNA, Conservation, Algeria.

The molecular diversity of the honey bee *Apis mellifera sahariensis* in Southern Algeria has been analyzed through the study of mitochondrial and nuclear DNA. The mitochondrial haplotype corresponding to the intergenic region tRNAleu-COII and ten microsatellite *loci* has been determined. Honeybees are sampled from 92 colonies in 2009-2010, 42 colonies Tellian race divided between the coastal zone and the Tell Atlas and 50 colonies of the Saharan race from the steppe and Saharan zones. The structural organization of the intergenic region of the Algerian populations shows that honeybees in Algeria are part of the African lineage A. Four haplotypes A1, A2, A8 and A9 are being highlighted. According to the Fisher test and the corresponding analysis, haplotypes A1 and A8 are significantly associated with the bee colonies Tellian ($P < 0.00001$), and the haplotype with the A9 Saharan bee colonies ($P < 0.0001$). It is possible that there is predominance of the A8 haplotype in the subspecies *A. m. intermissa* and haplotype A9 in the subspecies *A. m. sahariensis*. Genetic variation among Algerian bees evidenced by microsatellite markers is high. The average expected heterozygosity (He) obtained varies between 0.70 and 0.75. The average number of alleles obtained fluctuates between 6 and 8 at the population level. One apiary established for the conservation of *A. m. sahariensis* showed no indication of maternal introgression since all the colonies bear the same haplotype A9. Furthermore, Hardy–Weinberg equilibrium observed in this population indicates that this apiary is appropriate for conservation programs of *A. m. sahariensis.*

# The impact of a starving and refeeding diet on oxidative stress biomarkers of *Acipenser stellatus* (Pallas, 1771) under aquaculture conditions

Iulia Elena FLORESCU[1], Alexandru BURCEA[1], Gina-Oana POPA[1], Mihaela BALAȘ[1], Sorina VOICU[1], Iulia GRECU[2], Lorena DEDIU[2], Angelica DOCAN[2], Lucica TOFAN[3], Sergiu Emil GEORGESCU[1], Anca DINISCHIOTU[1], Marieta COSTACHE[1]

[1]University of Bucharest, Faculty of Biology, Department of Biochemistry and Molecular Biology, Splaiul Independenței Street No. 91-95, 050095, Bucharest, Romania, e-mail: iuliaflorescu_2006@yahoo.com, ancadinischiotu@yahoo.com, marietacostache@yahoo.com
[2]"Lower Danube" University of Galați, Faculty of Environmental Science and Biotechnology, Department of Aquaculture, Environmental Sciences and Cadastre, Domneasca Street No. 111, 800201, Galați, Romania, e-mails: iulia.grecu@ugal.ro, lorena.dediu@ugal.ro, angelica.docan@ugal.ro
[3]"Ovidius" University of Constanța, Faculty of Natural and Agricultural Sciences, Department of Biology-Ecology-Geography, Aleea Universității No. 1, 900470, Constanța, Romania, e-mail: lucicatofan@gmail.com

**Key words:** *Acipenser stellatus*, aquaculture, starving and refeeding diet, protein thiols, antioxidant biomarkers.

Because *Acipenser stellatus* has a great economical value being used for the production of caviar, this species has been overfished and the wild stocks have been dramatically reduced. Fish farming represents a conservation measure aimed to obtain aquaculture individuals that will be used to satisfy the high demand for caviar. Research in aquaculture is focused on optimizing the feeding regime of fishes. This study aimed to determine if *Acipenser stellatus* can adapt to a starving and refeeding diet by assessing the effects of this diet on oxidative balance of the individuals.

Forty-eight individuals were subjected to different feeding programs in aquaculture conditions: a control group was fed constantly, a group was starved for 7 days and refed 21 days and a group was starved for 14 days and refed 21 days. For each individual liver homogenates were obtained and the oxidative stress was evaluated by the level of protein thiols which reveals the status of protein oxidation and by two antioxidant biomarkers: the level of GSH and the glutathione reductase activity.

The protein thiols content increased in a time dependent manner in the experimental groups comparative to the control group, while the level of GSH was increased in the group starved for 7 days and refed and was decreased in the group starved for 14 days and refed. The glutathione reductase activity was intensified in the experimental groups. These results suggest that the GSH reserve was mobilized rapidly to reduce the oxidized protein thiols and that the recycling of the GSH mediated by glutathione reductase was stimulated. These findings prove that *Acipenser stellatus* could adapt to the oxidative stress produced by a starving and refeeding diet.

In conclusion, a starving and refeeding diet could be applied in aquaculture to lower the costs and sustain this kind of conservation measure.

# Sturgeon species diagnostic based on molecular markers

Andreea DUDU, Sergiu Emil GEORGESCU, Marieta COSTACHE

Faculty of Biology, Department of Biochemistry and Molecular Biology, University of Bucharest, Splaiul Independentei 91-95, Bucharest, zip code 050095, Romania, e-mail: tn_andreea@yahoo.com

**Key words:** sturgeons, DNA markers, molecular diagnostic.

Fish species diagnostic based on DNA markers analysis have become an essential requirement, both related to conservation issues or food traceability. An aspect of this important subject is related to the efforts of avoiding the commercial frauds, since there were recorded attempts to sell less expensive fish products as ones originating in more demanded and higher priced species. In this context, efforts are made for sturgeons' conservation and there is a tendency to reduce the pressure resulting from fishing these species by raising them in aquaculture. The methods used for diagnostic of fish species in generally should be rapid, unambiguous and cost efficient.

We proposed an efficient method based on nuclear markers, suitable both for pure species and hybrid detection. The molecular analysis includes the amplification of a set of eight microsatellite loci (LS19, LS34, LS54, LS39, Aox27, AoxD234, AnacC11 and AnacE4) in the Danube sturgeon species – Beluga sturgeon (*Huso huso*), Stellate sturgeon (*Acipenser stellatus*), Russian sturgeon (*Acipenser gueldenstaedtii*), Sterlet sturgeon (*Acipenser ruthenus*) – and their hybrids. The genotypic data were analyzed by different statistical methods using GENETIX and STRUCTURE software. According to our analysis individuals belonging to pure species clustered separately from hybrids ones. In case of the hybrids, the genitor species were detected with NewHybrids software and the maternal origin was confirmed by sequencing. Species specific alleles were identified and the confirmation of diagnostic was supplemented by DNA barcoding.

The method is efficient both in pure species and hybrids diagnostic in sturgeons and is applicable for a variety of biological samples like caviar, meat, fin fragments or scales.

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# Preliminary study regarding the presence of Atlantic Brown trout (*Salmo trutta* L.) in Romania

Gina-Oana POPA[1], Iulia Elena FLORESCU[1], Alexandru BURCEA[1], Doru BĂNĂDUC[2], Andreea DUDU[1], Sergiu Emil GEORGESCU[1], Marieta COSTACHE[1]

[1] Department of Biochemistry and Molecular Biology, Faculty of Biology, University of Bucharest, Bucharest, 050095, Romania, popa.gina.oana@gmail.com, marietacostache@yahoo.com
[2] Department of Environmental Sciences, Physics, Physical Education and Sport, Faculty of Sciences, "Lucian Blaga" University of Sibiu, Sibiu, 550012, Romania, banaduc@yahoo.com

**Key words:** brown trout, Atlantic lineage, Porumbacu River, molecular markers.

In the last years, in Romania, there have been published several mass-media reports regarding restocking activities with Brown trout in Făgăraș and Țarcu Mountains. Also, various other anthropic activities that might disrupt the species habitats were reported in the mentioned areas. Frequently, the fish targeted for restocking activities come from aquaculture farms, whose fish stocks might not be composed of indigenous Danubian brown trout, but composed of other non-native lineages, such as Atlantic, Mediterranean or Adriatic lineages, since the import of biological material represents a common practice.

For this study, we aimed to analyse the presence of such non-native brown trout in Porumbacu River, an Olt River tributary from Făgăraș Mountains, by using molecular markers.

The DNA was isolated by a standard extraction method from 21 biological samples represented by fin fragments, followed by PCR amplification of the D-loop mitochondrial region and Sanger sequencing. The sequences were analysed with BioEdit and DnaSP software, and compared with many others from GenBank in order to establish the evolutionary lineage and construct a phylogenetic tree using Mega software.

For the 21 sequences, we identified a mean number of differences of 4.15238, nine haplotypes, while the index for haplotype diversity had a value of 0.72381, showing a relatively high genetic diversity. The topology of the phylogenetic tree showed that three individuals from the Porumbacu River population were grouped in the Atlantic clade, while others were part of the Danubian clade. This result led us to further sequence analysis and we discovered that three individuals are not only grouped in a single haplotype, but also differ from the Danubian sequences by five nucleotides and by only one from the closest Atlantic neighbour sequence.

In conclusion, there might be Atlantic brown trout individuals in the Danubian *S. trutta* population. Due to the fact that these findings are preliminary results, further studies are planned including microsatellite analysis and other molecular markers.

# Characterization of certain ecological factors from Cozia massif that impact the dynamics of *Bombina variegata* populations

Victoria TATOLE, Florentin COJOCARIU

ASA Environmental Services S.R.L. e-mail: victoria.tatole@gmail.com; fcojocariu@gmail.com

**Key words:** water and soil chemistry, aquatic invertebrate communities, terrestrial invertebrate communities, Cozia.

There are presented the results obtained in the 2nd Phase of the Project "Genetic protocol for the estimation of population parameters (effective population size, genetic diversity) for the conservative management of Nature 2000 animal species (SCIGEN)", developed under the PNII Program, in partnership with the "Grigore Antipa" National Museum of Natural History

The research involved six locations from Cozia massif, where the presence of *Bombina variegata* was established (using the capture/recapture method) as statistically significant: Spinu (Spi), Călineşti (Lotrişor 3 (3Lot)), Valea lui Stan (Vst), Lotrişor (Lot), Forest road, Căciulata (Clt), Păuşa (Pau).

The ecological study targeted:

1. The characterization of some aquatic physical and chemical parameters: pH, aquatic temperature (gr. C), total hardness ($^o$d), O2 (mg/l), NH4 (mg/l), NO2 (mg/l), NO3 (mg/l), PO4 (mg/l), TDS (mg/l), conductivity (µs/cm), CBO5 (mg/l), Chlorides (mg/l), SO4 (mg/l), fixed residuum (mg/l),organic substances;
2. The characterization of some chemical soil parameters (pH, P, N, K) of the areas where the Barber traps were placed;
3. The UV values;
4. The characterization of aquatic macro-invertebrate communities;
5. The characterization of terrestrial invertebrate communities, using the Barber traps method.

The results are allowing an evaluation of the water and soil quality level, as well as an estimation of the trophic potential available for each of the studied *Bombina variegata* local populations.

At the same time, a compared analysis of the aquatic and soil physical-chemical parameters, and the invertebrate communities' structure in relation to the ecological requirements of *Bombina variegata*, for all investigated locations is given.

All the acquired data contributes toward achieving an informed image of the conservation status of some *Bombina variegata* local populations from Cozia National Park and the Natura 2000 site with the same name, as well as their neighboring areas.

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# Establishing the Romanian national monitoring program for Species of Community Interest – case study: GIS used for setting up the medium-term assessment plan for species of genera *Testudo* and *Emys*

Zsolt Csaba TÖRÖK[1]

[1]"Danube Delta" National Institute for Research and Development, 165 Babadag Str., 820112 Tulcea, Romania, e-mails: zsolt.torok@ddni.ro; torok_zsolt2004@yahoo.co.uk

**Key words:** *Testudo*, *Emys*, monitoring, GIS, Habitats Directive, Romania.

Among the native reptile species of Romania there are two species of genus *Testudo* (*T. graeca* and *T. hermanni*) and one species of genus *Emys* (*E. orbicularis*) nominated in the annexes of the Habitats Directive (Council Directive 92/43/EEC and Council Directive 2006/105/EC). In March – October 2012 period, in case of each species, the author developed with ArcView 3.1 polygon-type shapes with the records of the respective species, in the same manner as in case of other reptiles, as snakes (Török, 2014) and lizards (Török, 2015). Both data from scientific references and from the author's field investigations were up-loaded, resulting a data-base comparable to the one on which was based a recent report on the status of reptiles from Romania (Cogălniceanu et al, 2013) (most part of information from the bibliographical sources being probably the same in case of the present work and the one of Cogălniceanu et al., 2013).

The shp-layers with distribution (record) data were overlaid on the layer containing plots of 10x10 square km in the ETRS LAEA 5210 grid, resulting in case of *T. graeca* in 359 records (from 1863 - 2012 period) scattered over 80 plots, in case of *T. hermanni* in 157 records (from 1770 - 2010 period) scattered over 51 plots and in case of *E. orbicularis* in 603 records (from 1856 - 2012 period) scattered over 342 plots.

Taking into account the distribution of the record-plots, the currently available human resources and technical possibilities, a nation-wide monitoring plan (implemented in February 2013 – March 2015 period) was developed for periodical assessment of the ecological status of the above mentioned species in the following number of plots of 10x10 square km in the ETRS LAEA 5210 grid: *T. graeca* - 15 plots, *T. hermanni* - 6 plots and *E. obicularis* - 52 plots.

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# High incidence of shell injuries in an isolated and 'artificial' population of the Spur-thighed tortoise (*Testudo graeca ibera*) from Romania

Valentina E. MORARU[1,2], Ștefan R. ZAMFIRESCU[2,3], Alexandru STRUGARIU[2,3]

[1]Faculty of Biology, University of Bucharest, 91-95 Splaiul Independenței Blvd., Bucharest, 050095, Romania, e-mail: moraru.valentina@yahoo.com
[2]Moldavica Herpetological Group, 20A Carol I Blvd., Iaşi, 700505, Romania, e-mail: alex.strugariu@gmail.com, moraru.valentina@yahoo.com, s.zamfirescu@gmail.com,
[3]Faculty of Biology, "Alexandru Ioan Cuza" University, 20A Carol I Blvd., Iaşi, 700505, Romania, e-mail: s.zamfirescu@gmail.com, alex.strugariu@gmail.com

**Key words:** *Testudo graeca*, isolation, injuries, Dobrudja, Romania.

The Spur-thighed tortoise (*Testudo graeca*) has a broad but fragmented distribution range, comprising regions from southern Europe, North Africa and the Middle East. Many populations are isolated, some of them being at a distance of tens of kilometers one from another. The species is listed as Vulnerable (VU) in the IUCN Red List, while it is considered critically endangered at a national level in Romania, the species' northernmost range limit.

The Natura 2000 site "Dunele marine de la Agigea" (ROSCI0073) offered the opportunity to study an isolated populations of *T. graeca*. Although tortoises have been known to occur within the 11 ha fenced protected area for many decades, the populations is believed to be the result of several voluntary introductions of individuals captured in other Romanian areas. During our study, conducted in May 2015, turtles were actively sought using diurnal transects in time interval 8 A.M. – 19 P.M. Each encountered tortoise was sexed, measured, weighed, photographed, and released immediately after processing.

A total of 34 tortoises were identified (with 2 recaptures): 3 of them were found dead and 27 presented injuries on carapace and plastron. That fact indicates that only a small portion (12.9%) of the sample presented no external injuries. Apart from the 3 tortoises found dead, the remaining 27 tortoises displayed no signs of human inflicted injuries. The isolated and 'artificial' population studied by us presents a dramatically higher incidence of shell injury compared to populations studied by a previous, more comprehensive study.

The presence of these injuries in such a high density should be a warning for the authority in charge with the conservation of the studied site.

# Contribution to the avifauna study of the Bucharest newly declared protected area Lake Văcărești

Bogdan VRĂJITORU[1*], Angela PETRESCU[2], Cristina Andrea STAICU[3]

[1]Faculty of Biology, University of Bucharest, 91-95 Splaiul Independenței, Sector 5, 050095, Bucharest, Romania. *corresponding author, e-mail: bogdan30@gmail.com
[2]"Grigore Antipa" National Museum of Natural History, 1 Sos. Kiseleff, sector 1, 011341, Bucharest, Romania.
[3]Department of Biochemistry and Molecular Biology, Faculty of Biology, University of Bucharest, 91-95 Splaiul Independenței, , Sector 5, 050095,Bucharest, Romania.

**Key words:** Văcărești, avifauna, anthropic pressures.

Lake Văcărești is a protected area in Bucharest, Romania (coordinates 44.399762, 26.131829). Previously, a study was conducted in order to substantiate the recognition of the site as a protected area. Natural habitats are forming, several vegetation associations being identified at the moment: Danubian communities R2202, R5305 and anthropic communities R8704, R8703. Our study aims to contribute to the existing bird list of 94 species and to address the concern of current anthropic pressures. Fourteen field trips were made from March to October. From a total number of 109 species, a number of 73 were observed by us. Of those 73 species, 35 are nesting summer visitors, 25 are nesting residents, 8 are in transit and 5 are wintering in Romania. 17 species are mentioned in the Bird Directive, all 73 mentioned in the Bern Convention, 23 mentioned in the Bonn Convention, 6 are found in the Romanian red book of vertebrates (2005). 17 Aves orders were found. Passeriformes are represented by 36 species (49%), followed by 6 species of Anseriformes (8%) and 5 species of Pelecaniformes (7%). Lake Văcărești is used as a nesting ground by the IUCN Near Threatened *Aythya nyroca*, but also *Cygnus olor*, both species with successful breeding this year in Bucharest. *Remiz pendulinus* (5000-8000 pairs estimated nationwide), dependent of *Salix sp*., *Populus* sp. or *Thypha sp.* for nest building, is present here. Anthropic pressures and activities include vegetation burning (J01), fishing (F02.03.02), dwelling in improvised houses (E01.04), diggings for scrap metal (C01.07), solid waste deposits (E03.01), sheep grazing (A04.02.02), recreational visits (G01.02 and rare with motorized vehicles G01.03, but present). Good communication, further biodiversity monitoring to evaluate its evolving state, regulatory policies for recreational fishing, banning the use of nets and fishing boats, ecological recreational activities for the public are desirable as the next steps.

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# Impact of education and mass media activities on durable protection of bats (Chiroptera) in Romania

Szilárd BÜCS[1], István CSŐSZ[1], Csaba JÉRE[1], Georgiana MĂRGINEAN[1,2], Farkas SZODORAY-PARÁDI[1], Alexandra TELEA[1], Dragoş BĂLĂŞOIU[1]

[1]Romanian Bat Protection Association, Str. I. B. Deleanu nr. 2, 440014 Satu Mare, Romania, e-mails: szilard_bux@yahoo.com, styepan@freemail.hu, csaba.jere@aplr.ro, farkas@aplr.ro, alexandra.telea@gmail.com, contact@dragosb.com
[2]Department of Biology, University of Bucharest, 95-97 Splaiul Independenţei, Bucharest 5, Romania, e-mail: georgiana.marginean@gmail.com

**Key words:** *Rhinolophus*, vulnerable, colonies, conservation, Southern Romania, caves.

In the period 2014-2015, in frame of the project "Protecting the horseshoe bats in Romania", financed by the Conservation Leadership Programme, we implemented education and mass media activities throughout Romania, with the objective to change in a posivite way the public's attitude towards horseshoe bats and bats in general. The project's social page was well received (more than 2.500 Likes), and is one of the largest bat related online information sources in Romania. Articles published on the Think Outside the Box webpage, and also in one small local newspaper from Sasca Montană locality contributed directly to bat protection, by clearing up misconceptions about bats and establishing simple conversation guidelines. Our educational brochure was distributed in 1000 copies in 41 locations, including universities, protected areas, bookstores and local NGOs. A sticker series, created with attractive imagery and drawings was distributed all over Romania, especially, but not exclusively to schools and caver clubs. The continuous demand to distribute more stickers tells of its success and impact. We organized and held presentations about the importance of bats and bat protection in 9 cities, 15 locations, to a total of 305 participants, mainly teenagers. Based on pre- and post-evaluation, we observed significant increases in correct and positive answers after the presentations. Our activities contributed to clear up misconceptions about bats, to capture the attention of the large public regarding the importance of bats, to raise awareness about the need of bat protection, and to inform the public about the simplest ways of contributions. Education and awareness activities must carry on for long periods in order to be truly efficient. In order to maximise impact, we signed long term collaboration agreements with two schools, facilitating future education possibilities and constant shaping of the new generation.

# Current status, distribution and conservation of *Mesocricetus newtoni* and *Cricetus cricetus* (Mammalia: Cricetinae) in Bulgaria

Nedko NEDYALKOV[1], Ivaylo RAYKOV[2], Yordan KOSHEV[3], Ivanka ATANASOVA[4], Orlin DEKOV[5], Ilcho KOLEV[6], Veselina RAYKOVA[2], Anna STANEWA[7]

[1] National Museum of Natural History – Bulgarian Academy of Science, 1 Tzar Osvoboditel Blvd., 1000 Sofia, Bulgaria, e-mail: nnedko@gmail.com
[2] Museum of Natural History – Varna, 41 Maria Luiza Blvd., 9000 Varna, Bulgaria, e-mail: ivaylo.raykov@gmail.com
[3] Institute of Biodiversity and Ecosystem Research – Bulgarian Academy of Science, 1 Tzar Osvoboditel Blvd., 1000 Sofia, Bulgaria, e-mail: bgsouslik@gmail.com
[4] Shumen University, 115 Universiteska Str., 9700 Shumen, Bulgaria, e-mail: atanasova_ivanka@abv.bg
[5] Institute of Soil Science, Agrotechnologies and Plant Protection "Nikola Poushkarov", 2230 Kostinbrod, Bulgaria; e-mail:odekov@abv.bg
[6] Studen Kladenets Str., Vh. №1, PO 1, 7001 Russe, Bulgaria
[7] 22 San Stefano Str., 9000 Varna, Bulgaria, e-mail: staneva.anna@gmail.com

**Key words:** Hamster, Bulgaria, status, distribution, threats

Hamsters in Europe are represented by three species *Cricetus cricetus*, *Mesocricetus newtoni* and *Cricetulus migratorius* and their distribution range overlap in Bulgaria and Romania. All hamster species are rare and their populations (especially that of *Cricetus cricetus*) have sharply decreased throughout Europe in recent years, mainly due to the changes in agriculture (Nechay, 2000).

This article provides information about the current status of two hamster species, *C. cricetus* and *M. newtoni*, in Bulgaria. These species have been studied for more than 100 years, but there are still no reviews on their current status. Our study is based on the field research conducted between 2001 and 2014, with using live traps, field observations, and remains from the pellets of some owl species (*B. bubo*, *T. alba*, *A. noctua*). All known data about hamster distribution in Bulgaria, taken from publications, records of museum specimens, and personal reports are summarised. A total of 97 records of *M. newtoni* and 22 records of *C. cricetus* are included in the study. Both species inhabit agricultural lands (alfalfa and cereal fields), mainly in Northern Bulgaria (Danube plain and Dobrudzha). Recently, two findings of *M. newtoni*, both in owls' pellets, have been reported from places south of the Stara Planina Mountains (which divides Bulgaria into a northern and a southern part).

The main threats to the hamsters come from various agriculture practices – plugging the land immediately after harvesting; burning the abandoned and arable lands (this old practice is forbidden but still exists in Bulgaria due to lack of strict control); use of rodenticides; large monocultural fields (in the last years used mainly for industrial crops, such as rapeseed).

The populations of these rare species may also be affected by some biotic factors, e.g. predation (by mustelids, owls and diurnal raptors), and competition with other rodent species, such as the European souslik (*Spermophillus citellus*)

and the brown rat (*R. norvegicus*), the latter probably hunting on *M. newtoni* as well.

This study was partly funded by the Executive Environment Agency in Bulgaria, in the framework of project „Field studies of species distribution / assessment of the status of species and habitats throughout the country - phase I“, conducted by Balkani Wildlife Society, Sofia, Bulgaria

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# Testicular androgen regulation of pituitary-adrenal axis in the Saharan Gerbil, *Gerbillus tarabuli*

Yamina ZATRA[1,], Naouel AKNOUN-SAIL[1,] Arezki KHEDDACHE[2,1], Elara MOUDILOU[3], Jean-Marie EXBRAYAT[3], Farida KHAMMAR[1], Zaina AMIRAT[1]

Houari Boumediene University of Sciences and Technology,[1] Faculty of Biological Sciences, Laboratory of Research on Arid Lands, BP 32 El Alia, Bab-Ezzouar, Algiers, Algeria; e-mails: zatra_y@yahoo.fr, nawelaknoun@yahoo.fr, aa_ke@yahoo.fr, faridakhammar@gmail.com, amiratzaina@yahoo.fr.
[2]Faculty of Biological and Agronomic Sciences; University Mouloud Mammeri, Tizi-Ouzou, Algeria
[3]University of Lyon, UMRS 449, General Biology Laboratory, UCLy, Laboratory of Reproduction and Comparative Development, EPHE, 25 rue du Plat, F69288 Lyon Cedex 02, France

**Key words:** castration, adrenal cortex, androgen receptor, cortisol, ACTH, Saharan gerbil

Hormone interactions were known to allow the adaptation of organisms to their environment in order to assure survival and success of reproduction.

The aim of the present work was to study the sensitivity of the pituitary-adrenal axis to male sexual hormones in a nocturnal granivorous desert rodent *Gerbillus tarabuli* living in the Algerian Sahara desert. Our experiment focused on 30 adult male gerbils weighing 50.2 ± 12.1 g collected during the breeding season (late winter and spring) and divided into three groups (n=10): control, castrated (50days) and castrated treated with testosterone (7days). After euthanizing animals, adrenal glands were removed and fixed in 10% formalin and used for histological study and androgen receptor immunohistochemistry. Blood was collected in heparinized tubes and plasma cortisol and ACTH were analyzed by electro-chemiluminescence when androstenedione was estimated by ELISA method.

Our results show that androgen deprivation induced an increase in adrenal weight (30.1%, $0.001<p<0.01$), due to an enlargement of fascicular and reticular zone cells. Also these cells exhibited a strong labelling in androgen receptor immunoexpression. The endocrine status shows increases in cortisol, ACTH and androstenedione plasma levels (+146.8%; $0.001<p<0.01$, +77.1%; $0.01<p<0.05$, and +87.7%; $p>0.05$ respectively) in response to castration. However, testosterone replacement restores all the investigated parameters to the control status. These results suggest the involvement of testicular androgens in the seasonal modification of the pituitary-adrenal axis sensitivity mediated by androgen receptor.

This regulation was involved in the control of reproduction of this species in its natural host environment.

Hormone interactions were known to allow the adaptation of organisms to their environment in order to assure survival and success of reproduction.

# Functional features of beaver lodges in the Râul Negru River Basin

Alexandru GRIDAN[1,3] Șerban Octavian DAVIDESCU[1], Georgeta IONESCU[1,3]
Cezar UNGUREAN[1], Adriana DAVIDESCU[1], Claudiu PAȘCA[1,2]

[1]"National Institute for Research and Development in Forestry, Str. Cloșca no. 13, 500040 Brașov Romania, e-mails: titi@icaswildlife.ro
[2]Carpati Foundation
[3]Transilvania University of Brasov, Silviculture and Forest Engineering.

**Key words:** beaver, lodge, dam

Disappeared in Romania at the beginning of 19th century, the beaver was reintroduced between 1998-2003 in three main river of Romania (Olt, Mureș, Ialomița). Starting from 191 reintroduced individuals, the beaver population in Romania reaches now over 2000 animals. After the reintroduction on Olt River, the beaver population spread upstream on the tributaries that flow regularized. The worst conflictual situation consists of dam penetretion by beaver lodge.

The purpose of this study is the determination of lodge caracteristic and the danger created by them for the river dams.

In order to achieve this purpose, 8 river sectors were analysed. The length is between 272 and 671 m with active beaver population. On 7 river sectors, 83 beaver lodge were found, 23 of them, shows negative features which can put in danger river dams. The average length for the lodge is 3.49 m. These where built in the banks and follow the profile of the terrain. Gallery to the lodge have a length between 1and 5m and were dug in the river bank. Exceptionally there were found galleries longer than 5m which could perforate the dam.

The length of the galleries is directly correlated with slope between the bank and the dam, so if the slope is smaller the galleries are longer. When the dam is closer than 2 meters to the dam, the risk of dam penetration by beaver lodges and galleries is greater and animals have to be relocated from that area.

# Eurasian beaver (*Castor fiber* L.), distribution in Romania

Claudiu PAŞCA[1], Georgeta IONESCU[1], Daniel VIŞAN[1], Marius POPA[1], George SÎRBU[1], Alexandru GRIDAN[2], Liviu UNGUREANU[2]

[1]National Institute of Forestry Research and Development "Marin Drăcea" Braşov, Cloşca Str., Nr. 13, postal code 500040 e-mail: claudiu_tasi@yahoo.com, titi@icaswildlife.ro, geo@icaswildlife.ro
[2]Transylvania University of Braşov, Faculty of Forestry

**Key words:** beaver population, castor fiber, beaver distribution.

Periodical beaver population assessment it very important in the context of recent reintroduction (1998-2003) considering that population size can reflected largely the success of the reintroduction action.

The last estimation of beaver number was conducted between 2013-2014 at highest scale (national level) and took part on three river sistems: Olt, Mureş and Ialomiţa. Additionally, some new beaver presence points were added to the database. Beaver signs were observed in the Danube Delta, Uz River, Buzău River, Tisa and Vişeu. All these data are very interesting because are situated outside the known borders of beaver distribution range.

The methodology consists in inventory of inhabited dens and estimation the number of beavers in relation with the beaver presence signs and impact on woody vegetation. Large beaver families need more food and often creates large gaps in the riparian vegetation.

For an accurate comparative analysis of different sets of data bases, the number of active burrows is the most quantifiable element.

The results are showing that beaver population is growing both numerical and spatial. They were found 674 dens and more than 1850 beavers estimated. In comparison with the last estimation (2009-2010) the number of dens increased with 76%. On Olt and Mureş rivers, the beaver population is doubled in the period 2009-2014. More interesting is the evolution of Ialomiţa River population which increased 5 times from 15 to 78 families.

In Romania Eurasian beaver is spread in all biogeographic regions and have a good state of preservation, if we take into consideration only the populated areas. The next step is to populate other water courses populated in the past.

# Experimental census technique for Red Deer (*Cervus elaphus*) in a recolonized mountainous area (Apuan Alps Geopark, Italy)

Paola FAZZI[1], Marco LUCCHESI[2], Fabio VIVIANI[3], Giovanni SPERONI[3], Giovanni Andrea BERTOLA[3], Nicola RAFFAELLI[3]

[1]Wildlife Biologist, Via Dante Alighieri 36, 54038 Montignoso (MS), Italy , e-mail: paolafazzi11@yahoo.it
[2]Wildlife Biologist, Via S. Francesco 79, Livorno, Italy, e-mail: marco.lucchesi6@tin.it
[3]Apuan Alps Geopark, Via Corrado del Greco 55047 Seravezza (LU), Italy, e-mail: fviviani@parcapuane.it

**Key words:** red deer, census, Apuan Alps, rutt activity

The stags vocal display occur in early autumn during the breeding season. In this period, when males show a territorial behaviour, the rutting census is applied to estimate the number of adult males. The Red Deer abundance is then carried out by comparing the number of stags and the population structure data.

The traditional rutting census is performed on fixed hearing stations using an high number of operators covering uniformly the area (Mazzarone et al.1991). Due to the low number of people available, Lucchesi et al. (2011) proposed an alternative method based on hearing stations on transects, with operators walking at regular speed from the early evening hours till the dusk hours. Breif stops have been planned in those stations and whenever a rutt of a not previously heard animal was perceived. However, because of Red Deer low density, stags tend to reduce considerably their rutting activity, leading to a numerical underestimation of reproductive males. For this reasons, starting in 2014, the previous method was improved emitting recorded stimulus from the hearing stations, to increase the response rate. The population structure is then obtained by camera trapping survey performed in the whole year.

In this study we propose a new method adjusted to area with a low Red Deer abundance, studying the recent recolonization of red deer in the Apuan Alps Geopark.

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# Intrapopulation genetic diversity investigation of Racka sheep (*Ovis aries* Linnaeus, 1758) breed from Romania

Sergiu Emil GEORGESCU[1], Andreea DUDU[1], Gina-Oana POPA[1], Alexandru BURCEA[1], Elena GHIȚĂ[2], Marieta COSTACHE[1]

[1] University of Bucharest, Faculty of Biology, Department of Biochemistry and Molecular Biology, Splaiul Independentei 91-95, Bucharest, 050095, Romania, e-mail: sergiu.georgescu@bio.unibuc.ro
[2] National Research Development Institute for Animal Biology and Nutrition, Bucuresti Avenue 1, Balotesti, Ilfov, 077015, Romania

**Key words:** Racka, local breed, mtDNA, genetic diversity.

Genetic characterization of local breeds is the first step for their conservation. Racka is a local sheep breed with controversial origins which currently can be found in Hungary, Serbia and Romania. The first register of the breed was made in Hungary in the early nineteenth century.

The current study aimed at analyzing the intrapopulation variability by using mtDNA markers suitable for intraspecific studies. The cytochrome b gene is considered to be variable enough for population level questions, and conserved enough for clarifying deeper phylogenetic relationships. Control region evolves faster than other regions because of reduced functional constraints and are well suited for intraspecific analyses.

In the current study we analyzed 40 unrelated individuals of both sexes from Caraş-Severin County, Romania. Genomic DNA was isolated from blood samples by using a dedicated kit. A 743 bp mtDNA *cyt b* gene and a 175 bp control region fragments were amplified and sequenced by Sanger Dye-terminator method. The sequences were visualized and edited with BioEdit software and the concatenated data alignment was performed with ClustalW algorithm implemented in MEGA5. The sequences were analyzed for polymorphic sites, number of haplotypes (n), haplotypes diversity ($H_d$), nucleotide diversity (Pi) and average number of nucleotide differences (k) were calculated using DnaSP v5.1. For the concatenated sequences, 903 invariable and 15 variable sites were highlighted. The polymorphic sites were all parsimony informative and all the polymorphisms were represented by transitions. A number of 12 haplotypes were identified, showing an $H_d$ index of 0.897, a Pi of 0.00437 and a value of k 4.015. In comparison to previously well-defined sheep mtDNA lineages, the haplotypes identified in Racka can be clearly grouped A and B lineages.

The Romanian Racka showed a good genetic diversity comparable with the one that have been reported in other Asian and European sheep breeds.

# Livestock - large carnivores conflict in the Carpathian Mountains (Romania)

Guido RASTRELLI[1,3], Andrea CORRADINI[2,4], Kieran O'MAHONY[3], Gabriella RIZZARDINI[4], Ioan-Mihai POP[4], Silviu CHIRIAC[3], Andrea GAZZOLA[4]

[1] Alma Mater Studiorum University of Bologna, Via Zamboni 33, 40126 Bologna, Italy, e-mail: guidorastre@hotmail.it
[2] University of Florence, P.zza S.Marco 4, 50121 Firenze, Italy, e-mail: corradini.andre@gmail.com
[3]Environmental Protection Agency Vrancea, 2 Dinicu Golescu Str., 620106, Focşani, Vrancea, Romania, e-mails: kieranjohnomahony@hotmail.com; silviu_chiriac@yahoo.com
[4] Association for the Conservation of Biological Diversity, Str. Ion Creangă. no. 12, 620083, Focşani, Vrancea, Romania, e-mails: gabriellarizzardini@virgilio.it; mihai.pop@acdb.ro; andreagazzola@yahoo.it.

**Key words:** livestock damage, wolf, brown bear, Romania, Carpathian Mountains, human conflict, antipradator measures.

Large carnivores can represent a threat to livestock and traditional farming methods if there are not effective management strategies to cope with potential encounters. In our study area (1200 km$^2$), located in the Central Eastern Carpathian Mountains, we investigate both the husbandry practices and ecological variables that could affect such conflict. Data was collected during fieldwork undertaken in summer 2015 as part of the WOLFLIFE project – (LIFE13NAT/RO/000205). 202 brown bear (*Ursus arctos*) and 74 wolf (*Canis lupus*) excrements were collected from 44 transects (total length: 542 km). Excrements were used to assess the distribution and relative abundance of large carnivores. Sample units were represented by a circular plot (3 km radius) centred on each sheepfold we surveyed (n= 34). Spatial analysis was performed using KAI (Kilometric Abundance Index) and a kernel method. Information on husbandry practice and damage perception was collected from interviews with shepherds. Variables selected for analysis were flock size, number of sheepdogs and flock size/number of dogs. The area of forest cover was also calculated for each plot. Results showed 44.1 % (n=15) of sheepfolds were attacked by wolves and 38.2% (n=13) by bears. 10 sheepfolds lost livestock to wolves and only 2 to bears. We did not find a significant difference in large carnivore relative abundance between circular plots with attacks and those without. The area of forest cover was not significant. Although sheepfolds with losses generally had fewer livestock guardian dogs than those without, this difference was not significant. In several other European studies, damage is shown to be unevenly distributed and linked to presence or absence of preventive measures. However, in our study area, damage is widely distributed, whilst most sheepfolds tend to have similar antipredator measures. Further studies focused on which environmental variables influence damage distribution should be made.

# Shedding light on donations of the past – The invertebrate collection of Ion Cantacuzino from "Grigore Antipa" National Museum of Natural History

Iorgu PETRESCU[1], Ana-Maria PETRESCU[1,2]

[1] "Grigore Antipa" National Museum of Natural History, 1 Kiseleff Blvd, 011341 Bucharest, Romania, e-mail: iorgup@antipa.ro, anapetrescu@antipa.ro
[2] Department of Biochemistry and Molecular Biology, Faculty of Biology, University of Bucharest, 91-95 Splaiul Independenței, 050095 Bucharest, Romania

**Key words:** invertebrate collection, Mediterranean Sea, donation

Most of the scientific invertebrate collections of "Grigore Antipa" National Museum of Natural History were built during the decades from the grace of numerous and illustrious donors. Prof. Ion Cantacuzino, a remarkable personality of the 20th century donated a collection of small invertebrates, the first donation of species from the Mediterranean Sea.

In order to compile a list of donated taxons from Ion Cantacuzino's collection, the present invertebrate collection's inventory of „Grigore Antipa" National Museum of Natural History had been studied and compared with older inventory files from museum's archives, including Grigore Antipa's 1931 inventory. Also, the old and new inventory numbers were compared and their correspondence in the collection. The presence or the absence as well as the aspect of the outer and inside labels were noted. The writing of the labels, in ink or in pencil, could certify their originality and value, those written by hand in pencil by Cantacuzino himself and those in ink, by Grigore Antipa, thus linking to the existence of a donation's catalogue and an aproximate idea of a certain volume. The invertebrate species were catalogued by their taxonomical classification, according to the present nomenclature, completed with data regarding their worldwide present distribution.

Between 1898 and 1899 Prof. Dr. Ion Cantacuzino donated a collection of marine and fewer terrestrial invertebrates from the Mediterranean Sea, Villefranche-sur-Mer bay, to the Museum of Natural History from Bucharest. Original inventory of Cantacuzino was lost. Grigore Antipa mentioned in his inventory book 70 species, 22 species donated in 1898 and 48 in 1899 of Protozoa, Porifera, Coelenterata, Annelida, Mollusca, Crustacea, Echinoderma, Tunicata, Chaetognatha, Rotifera, Sipuncula, Scorpiones. In the present collection there are 70 invertebrate species with 73 specimens, 45 species present, while 25 species were lost during the time.

This catalogue represents the first mention in more than 100 years of this donation.

# The entomological collection of the Natural History Museum of Sibiu - an overview

Gabriela CUZEPAN[1], Ioan TĂUȘAN[2],
Eckbert SCHNEIDER[3], Sergiu-Cornel TÖRÖK[4]

[1]Brukenthak National Museum, Natural History Museum, 1 Cetăţii Str., Sibiu, 550169, Romania, e-mail: gabrielacuzepan@gmail.com
[2] "Lucian Blaga" University of Sibiu, 5-7 Dr. Ion Rațiu Str., 50012, Sibiu, Romania, e-mail: itausan@gmail.com
[3]Arbeitskreis für Siebenbürgische Landeskunde, Heidelberg e. V., Sektion Naturwissenschaften, Weserstr. no. 2, Rastatt, 76437, Germany
[4]Mediaş Municipal Museum, 46 Mihai Viteazul Str., Mediaş, Romania, e-mail: ser.torok@yahoo.com

**Key words:** Transylvania Society for Natural Science, collections, insects, museum heritage.

On the 4th of May 1849 the Transylvanian Society of Natural Sciences (*Siebenbürgischer Verein für Naturwissenschaften zu Hermannstadt*) was established following the approval by the Government of the Austro-Hungarian Monarchy in Viena. The Society had been founded following the desire of naturalists, who belonged to the Society for Research of Transylvania (*Verein für Siebenbürgische Leandeskunde*) and aimed to establish a narrower nature society (Pop, 1970). In the society status, the naturalists aimed at presenting and discussing the natural sciences aspects in meetings, building a natural sciences collection in Sibiu, acquisitioning of journals and books and setting up a library and publishing their results in the society journal (Drăgulescu, 1998). The Society has successfully fulfilled its goals and manages to build valuable collections, including the entomological one.

The members' research fields were diverse, but in terms of insect collections they had mainly two well defined directions: beetles and butterflies. This was mainly because they were considered "the richest groups of insects, more diverse and more appealing to the eye, which exerted a stronger pull, polarizing around them a great number of naturalists, both professionals and amateurs" (Ieniştea 1970). But naturalist entomologists concerns were not limited to these two groups, they focused on other groups of insects and managed over time to successfully achieve their goals and contribute to research and build a natural science collections.

The Entomological collection is now one of the largest collections of the Natural History Museum of Sibiu. The Transylvanian Society for Natural Sciences through its members established this collection, who intensively studied the insects of Transylvania. Although in the early years the members of the Society were particularly interested in studying beetles and butterflies, research was carried out over time on other groups of insects such as dragonflies, grasshopper, locusts, flies, bees and so on. After the nationalization, the work of the Society was continued by numerous researchers who have enriched the collection every year with numerous species from many insect groups.

Nowadays, this collection has a special value, both historically and scientifically-documentary. This is due to the large number of species and specimens collected form Transylvania and other Romanian regions, and it consists of many types, but also rare and endemic species types (mostly beetles). Moreover, a significant number of exotic species (butterflies and beetles) are present in the collections. The origin of this material is due to collections made by members of the Society and exchanges with other researchers of the world.

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# Butterfly and moth in Natural History Museum of Bu-Ali Sina University

Farshad MASOUDIAN[1,2], Mohammad KHANJANI[2], Bahman ASALI FAYAZ[2], Amir JAFARI[1]

[1] Museum of Natural History, Bu-Ali Sina University, Hamedan, Iran. e-mails: f.masoodian@gmail.com; amirsun@gmail.com
[2] Department of Plant Protection, Faculty of Agriculture, Bu-Ali Sina University, Hamedan, Iran. e-mails: f.masoodian@gmail.com; mkhanjani@gmail.com; basalifayaz@gmail.com

**Key words:** insect, lepidoptera, phytophagous, museum, Hamedan, Iran.

The butterflies and moths (Insecta: Lepidoptera) are common insects, well known to everyone with high distribution in the world, which distinguish other insects by having scales on the wings from (Triplehor and Johnson, 2005). The larvae of most species of this order can feed on plants and fabric materials, being an important phytophagous pest for agriculture with high economic importance. While, some adult members of this large group of insects, especially coloured wing butterflies [Lepidoptera as one of the largest inset orders after Coleoptera, with more than 157000 species (Zhang, 2011)] are introduced as an excellent and beautiful model in natural history museums that can be attractive for visitors. The zoological specimens (e.g. butterflies and moths) as valuable heritage are presented for improving visitor's biology knowledge. Natural history museum of Bu-Ali Sina University, Hamedan, Iran as one of important reginal tourism destinations, was typically ornamented with more than 8000 butterfly and moth specimens (mostly butterflies which are endemic to Iran) belonging to different families such as Hesperiidae Latreille, 1809; Nymphalidae Rafinesque, 1815; Lycaenidae Leach, 1815; Pieridae Swainson, 1820; Papilionidae Latreille, 1802; Saturniidae Boisduval, 1837; Noctuidae Latreille, 1809; Geometridae Leach, 1815; Sphingidae Latreille, 1802; Sesiidae Boisduval, 1828, that it plays a direct role in the presentation quality in increasing visitor's satisfaction (~ 80%).

**References:**

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# Diopsidae (Diptera) of India, Indonesia and Africa, from the collections of "Grigore Antipa" National Museum of Natural History (Bucharest, Romania)

Corneliu PÂRVU, Lavinia IANCU

"Grigore Antipa" National Museum of Natural History, Şos. Kiseleff no. 1, 011341, Bucharest 1, Romania, e-mails: cparvu@antipa.ro, lavinia.paul@antipa.ro

**Key words:** Diopsidae, India, Indonesia, Africa, Grigore Antipa collections.

Diopsidae family belongs to the Diopsoidea superfamily placed within Muscomorpha infraorder. This family of stalk-eyed flies has caught attention since many years ago due to their curious appearance and morphology of the head.

The species are spread mostly in the tropical regions of the world, except *Sphyracephala* genus. The species of this genus are spread in the Holarctic, Ethiopian and eastern regions, with some scarce inhabitants in the Palearctic and Nearctic areas.

The crossbeam head with the eyes located at the end of the cephalic extremity are characteristic for this family, with the exception of the *Centrinocus* genus, that does not present eyestalks and peristomal teeth. Antennae and arista can be present.

In the collections of "Grigore Antipa" Museum, the family is represented by a single species with uncertain taxonomic identification. In October 2014, our colleague, Liviu Moscaliuc, enriched the Diopsidae collections with specimens sampled from India (Meghalaya, Kharkhana, rocks in waterfall). During the expedition in Indonesia, 1991, organized by the "Grigore Antipa" Museum, the first author of the paper, C. Pârvu, sampled several Diopsidae specimens. Our former colleague, dr. Şerban Procheş, has provided the Museum ten specimens from South Africa (Durban).

Presently, the "Grigore Antipa" Diptera collection comprise forty-five specimens from Africa (Guinee, Cameroon, Central and South Africa), Indonesia and India.

Thereby, from Africa, *Diopsis, Diasemopsis, Euridiopsis*, with *Diopsis apicalis* Dalman (Guinea), *D. confusa* Wiedemann (Cameroon), *D. fasciata* Gray (Central Africa) and another three unidentified specimens from Guinee, Uganda, and South Africa were classified.

From Indonesia (Sulawesi Island), *Pseudodiopsis detrahens* Walker was identified and from India, the specimens were classified as belonging to *Diopsis* genus.

The present paper contains preliminary data on the Diopsidae family found in the "Grigore Antipa" Museum. The taxonomic identification of this specimens was performed at genus or even at species level. Given the fact that this family contains a number of synonyms, the taxonomic identification continues until the accurate classification of species.

# Marine fishes and sea anemones in Natural History Museum of Bu-Ali Sina University

Farshad MASOUDIAN[1,2], Bahman ASALI FAYAZ[2],
Soheil MASOUDIAN[1], Amir JAFARI[1]

[1] Museum of Natural History, Bu-Ali Sina University, Hamedan, Iran. e-mails: f.masoodian@gmail.com; soheil.masoodian@gmail.com; amirsun@gmail.com
[2] Department of Plant Protection, Faculty of Agriculture, Bu-Ali Sina University, Hamedan, Iran. e-mails: f.masoodian@gmail.com; basalifayaz@gmail.com

**Key words:** Perciformes, Saltwater fish, Actiniaria, Hamedan, Iran.

Natural history museums are introduced as an important source of natural inspiration for the general community in different aspects and also have a duty to store native and non-native permanent (Miyazaki *et al*., 2015) and temporary collections. In order to improv the public knowledge, natural history museums are trying to use live animals [*e.g.* saltwater aquarium fishes and sea anemones). Marine fishes (order: Perciformes) and sea anemones (order: Actiniaria) with beautiful, bright color and personality (as a beautiful exhibition model in natural history museums) are generally known as one of the most important living jewels that can be attractive for visitors. Saltwater aquariums of natural history museum of Bu-Ali Sina University (except freshwater part) was typically ornamented with approximately 500 specimens belonging to 45 live species of exhibition marine fishes and sea anemones (such as Blue tang surgeonfish; Powder blue surgeonfish; Sohal Surgeonfish; Elegant unicornfish; Orangespine unicornfish; Yellow-tail blue Tang; Red Sea Sailfin Tang; Yellow Tang; Twotone Tang; Banggai Cardinalfish; Clown triggerfish; Picasso triggerfish; Halfmoon triggerfish; Mandarinfish; Black-spotted Butterfly fish; Yellow Butterflyfish; Butterflyfishes; Copperband Butterflyfish; Pennant coralfish; Blue-spotted Stingray; Orbicular Batfish; Decorated goby; Gulf goby; Arabian carpetshark; Bird mouth Wrasse; Moon Wrasse; Silver moony; White Ribbon Eel; Sergeant major; Clark's Clownfish; Tomato Clownfish; Ocellaris Clownfish; Bluestriped angelfish; Black-tailed Damsel fish; Domino Damsel; Yellowbar Angelfish; Maroon Clownfish; Orange Dottyback; Common Parrotfish; Spotted Scat; Humpback grouper; Foxface Rabbitfish; Sebae Anemone; Haddon's Carpet Anemone; Merten's Carpet Anemone) belonging to different families that can play a direct role in the presentation quality in increasing visitor's satisfaction. The scientific names of the specimens are below:

Acanthuridae: *Acanthurus coeruleus* Bloch & Schneider 1801; *Acanthurus leucosternon* Bennett, 1833; *Acanthurus sohal* (Forsskål, 1775); *Naso elegans* (Rüppell, 1829); *Naso lituratus* (Forster 1801); *Paracanthurus hepatus* (Linnaeus, 1766); *Zebrasoma desjardinii* (Bennett, 1836); *Zebrasoma flavescens* (E. T. Bennett, 1828); *Zebrasoma scopas* (Cuvier, 1829).

Apogonidae: *Pterapogon kauderni* Koumans 1933.

Balistidae: *Balistoides conspicillum* (Bloch & Schneider, 1801); *Rhinecanthus assasi* (Forsskål, 1775); *Sufflamen chrysopterum* (Bloch & Schneider, 1801).

Callionymidae: *Synchiropus splendidus* (Herre, 1927)

Chaetodontidae: *Chaetodon nigropunctatus* Sauvage, 1880; *Chaetodon semilarvatus* Cuvier, 1831; *Chaetodon* sp.; *Chelmon rostratus* (Linnaeus, 1758); *Heniochus acuminatus* (Linnaeus 1758).

Dasyatidae: *Taeniura lymma* (Forsskål, 1775)

Ephippidae: *Platax orbicularis* (Forsskål, 1775)

Gobiidae: *Istigobius decoratus* (Herre, 1927); *Valenciennea persica* Hoese & Larson, 1994.

Hemiscylliidae: *Chiloscyllium arabicum* Gubanov, 1980

Labridae: *Gomphosus caeruleus* Lacepède, 1801; *Thalassoma lunare* (Linnaeus, 1758);

Monodactylidae: *Monodactylus argenteus* (Linnaeus, 1758)

Muraenidae: *Pseudechidna brummeri* (Bleeker, 1859)

Pomacentridae: *Abudefduf saxatilis* (Linnaeus, 1758); *Amphiprion clarkii* (Bennett, 1830); *Amphiprion frenatus* Brevoort, 1856; *Amphiprion ocellaris* Cuvier, 1830; *Chaetodontoplus septentrionalis* (Temminck & Schlegel, 1844); *Dascyllus melanurus* Bleeker, 1854; *Dascyllus trimaculatus* (Rüppell, 1829); *Pomacanthus maculosus* (Forsskål, 1775); *Premnas biaculeatus* (Bloch, 1790).

Pseudochromidae: *Pseudochromis aldabraensis* Bauchot-Boutin, 1958.

Scaridae: *Scarus psittacus* Forsskål, 1775.

Scatophagidae: *Scatophagus argus* (Linnaeus, 1766).

Serranidae: *Cromileptes altivelis* (Valenciennes 1828).

Siganidae: *Siganus vulpinus* (Schlegel & Müller, 1845).

Stichodactylidae: *Heteractis crispa* (Hemprich and Ehrenberg in Ehrenberg, 1834); *Stichodactyla haddoni* (Saville-Kent, 1893); *Stichodactyla mertensii* Brandt, 1835.

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# Aspects concerning replicas techniques for zoological materials used in museum displays and biological studies

Radu Ştefan PANĂ[1], Bogdan Alexandru FRĂŢILĂ[1],
George Ştefan NĂZĂREANU[1], Mircea Liviu CIOBANU[1]

[1]"Grigore Antipa" National Museum of Natural History, Şos. Kiseleff no. 1, 011341 Bucharest 2, Romania, e-mails: raduspana@yahoo.com, bogdan.fratila@antipa.ro, george_nazareanu@antipa.ro

**Key words:** replica technique, resin, biological studies, zoological materials, amphibian, reptile.

Museum collections can be an inexhaustible source for creating replicas, used for study or to improve the sceneries inside dioramas.

Due to the fact that wet preserved zoological materials, such as amphibians or reptiles, can't always be used in didactic porposes or displayed in dioramas, using a replica is an optimal solution.

The hereby work it is useful to the museums, due to the fact that such replicas made from polyresin material copies the zoological materials highly accurately. Also, the material is long term resistant to handling.

The permanent exhibition of "Grigore Antipa" National Museum of Natural History is hosting a fire salamander replica (*Salamandra salamandra*), made in the museum's Taxidermy and Restoration Laboratory using this technique.

We present the making of a full replica production of an European green lizard (*Lacerta viridis*), which was initially preserved in ethanol. The original was placed in a natural position, the mold of its body being taken using RTV silicone rubber with 6 hours catalyst (which vulcanises at room temperature), so that the molding process being non disctuctive for the original. The polyresin replica was manually painted with acrylic products using airbrush and brushes of different size.

The final result is a perfect realistic replica with 1:1 scale detail accuracy, which can be used in various study activities (such as seminars, biology classrooms, children workshops etc.) or be displayed in museum exhibitions.

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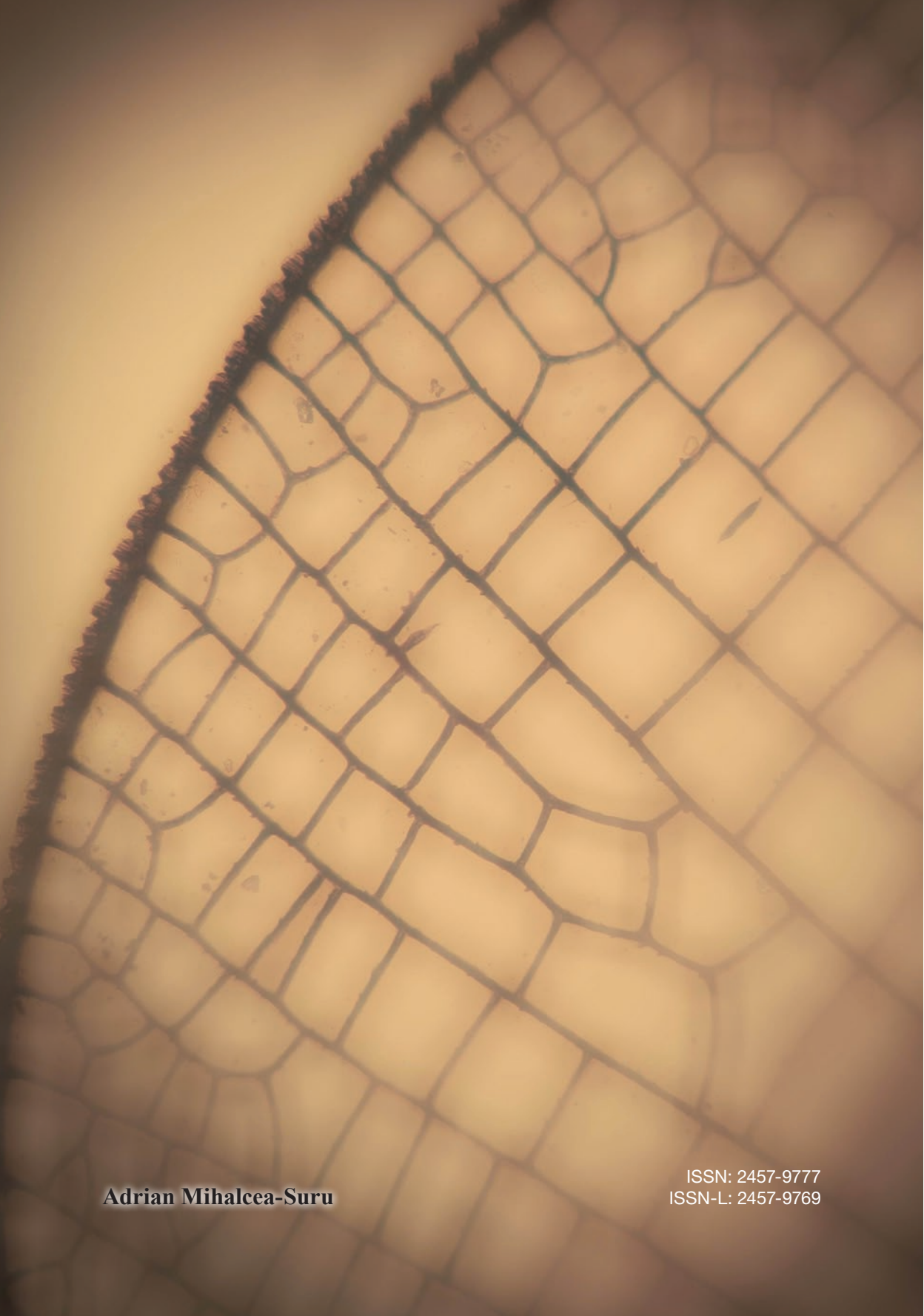

Adrian Mihalcea-Suru

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