# Annual Zoological Congress of "Grigore Antipa" Museum


**20-23 November 2013**
**Bucharest - Romania**

# Book of Abstracts

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

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CZGA
Annual Zoological Congress of "Grigore Antipa" Museum

MUZEUL NAȚIONAL DE ISTORIE NATURALĂ GRIGORE ANTIPA

ACADEMIA ROMÂNĂ

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# Summary



## Invited speakers



## Oral presentations

### Taxonomy. Faunistics. Zoogeography

## Forensic entomology



## Palaeontology



## Ecology

## Biodiversity conservation

## Poster presentations

**Taxonomy. Faunistics. Zoogeography**

## Forensic entomology



## Systematics and evolutionism



## Palaeontology



## Ecology

## Invasive species

## Parasitism in the animal kingdom



## Biodiversity conservation

# CZGA 2013 PROGRAMME

## WEDNESDAY, 20th OF NOVEMBER 2013

8:30-12:00
**Registration**

9:00-9:10
**Dumitru MURARIU -** Welcome and greetings

## Invited speakers

9:10-9:50
**Octavian POPESCU -** How do new species arise?

9:50-10:30
**Marian-Traian GOMOIU -** Mollusk population changes at the Romanian Black Sea coast

10:30-11:10
**Boris KRYŠTUFEK -** Natural history collections and integrated view on the mammalian diversity in South-Eastern Europe

***11:10-11:40***
***Coffee break***

## Taxonomy. Faunistics. Zoogeography

### Chair: Victor SURUGIU (Iași, Romania)

11:40-11:55
**Ümit KEBAPÇI, Mehmet Zeki YILDIRIM -** Zoogeography of slugs in the Mediterranean Basin: palaeogeographical implications

11:55-12:10
**Victor SURUGIU -** Is *Eunereis longissima* (Polychaeta: Nereididae) a new record for the Romanian Black Sea coast?

12:10-12:25
**Denis COPILAȘ-CIOCIANU, Michał GRABOWSKI, Adam PETRUSEK, Lucian PÂRVULESCU -** Zoogeography of epigean freshwater Amphipoda (Crustacea: Malacostraca) of Romania

12:25-12:40
**Omid JOHARCHI, Maryam MORADI -** Review of the genus *Myrmozercon* Berlese (Acari: Laelapidae)

12:40-12:55
**Ionuț Ștefan IORGU, Liviu Aurel MOSCALIUC, Elena Iulia IORGU -** New data on the crickets and grasshoppers (Insecta: Orthoptera) from Dobrogea (Romania)

12:55-13:10
**Ionuț Ștefan IORGU -** Distribution and acoustics of *Isophya* species (Insecta: Orthoptera: Phaneropteridae) in eastern and northern Romania

***13:10-14:10***
***Lunch break***

**Chair: Victor SURUGIU (Iaşi, Romania)**

14:10-14:25
**Irinel E. POPESCU -** First record of the genus *Dorypteryx* Aaron, 1883 with *Dorypteryx domestica* (Smithers, 1958) (Psocoptera: Psyllipsocidae) in Romania

14:25-14:40
**Saeed MOHAMMADZADE NAMIN -** New data on the *Tephritis maccus* species group (Diptera: Tephritidae) in the Palaearctic region

14:40-14:55
**Mihai STĂNESCU -** On the true identity of *Calamotropha olarui* Nemeş, 1972 (Lepidoptera: Crambidae)

14:55-15:10
**Ioan TĂUŞAN, Alexandru I. RĂDAC -** Faunistic novelties for the Romanian ant fauna (Hymenoptera: Formicidae)

15:10-15:25
**Irinel E. POPESCU -** Chalcidoids (Hymenoptera: Chalcidoidea) from Văcăreşti Valley (Bucharest, Romania)

15:25-15:40
**Juli PUJADE-VILLAR, Ion SCHIOPU -** A new species of herb gall wasp (Hymenoptera: Cynipidae: Aylacini), from southeastern Romania (Dobrudja Province) inducing galls on *Papaver* sp. (Papaveraceae)

15:40-15:55
**Monica LUCA, Anna LINDERHOLM, Adrian BĂLĂŞESCU, Simina STANC, Greger LARSON -** The archaeogenetic analysis of Neolithic swine remains in the Romanian territory

15:55-16:10
**Simona STAVRI, Otilia ZĂRNESCU -** The effect of cadmium chloride on caudal fin regeneration in *Corydoras aeneus* and *Carassius auratus gibelio*

***16:10-16:40***
***Coffee break***

**Chair: Victor SURUGIU (Iaşi, Romania)**

16:40-16:55
**Abdeljebbar QNINBA, Sidi Imad CHERKAOUI -** Inventory and distribution of cichlids (Pisces: Perciformes) in Morocco

16:55-17:10
**Edoardo VERNIER, Bronisław W. WOŁOSZYN -** First data on the presence of bats (Mammalia: Chiroptera) in the Cansiglio Forest (Venetian Pre-Alps, N. E. Italy)

17:10-17:25
**Edoardo VERNIER, Bronisław W. WOŁOSZYN -** Further range expansion and ecology of a winning strategy of *Pipistrellus kuhlii* (Kuhl, 1817), a vespertilionid bat in expansion in Europe

17:25-17:40
**Manuel RUEDI, Jayant BISWAS, Oana CHACHULA, Thomas ARBENZ -** Chiroptera fauna from Meghalaya - results of the expedition Caving in the Abode of the Clouds Project (2011-2012 Jaintia Hills), India

## Invasive species

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

17:40-17:55
**Cristina PREDA, Sven BACHER -** Towards a black list of invasive alien species in Romania

17:55-18:10
**Ümit KEBAPÇI -** Invasiveness and resilience in nonmarine mollusks of Turkey

18:10-18:25
**Marius SKOLKA, Alexandru Dan DIAC -** *Metcalfa pruinosa* in Constanța (Romania) after 5 years from the first report

18:25-18:40
**Marius SKOLKA, Selma MENABIT, Georgiana PUIA, Anca PĂUN -** Monitoring of the Leaf miner *Cameraria ohridella* (Lepidoptera: Gracillariidae) in Constanța – Romania (May – October 2013)

***18:40-18:55***
***Discussions***

***18:55-19:45***
***Poster session***

## THURSDAY, 21st OF NOVEMBER 2013

8:30-12:00
**Registration**

## Invited speakers

9:00-9:40
**Dan COGĂLNICEANU, Paul SZÉKELY, Diana SZÉKELY, Florina STĂNESCU, Elena BUHACIUC, Ciprian SAMOILĂ, Iosif RUBEN, Raluca Ioana BĂNCILĂ, Daniela ROŞIORU -** Life history strategies of spadefoot toads (genus *Pelobates*)

9:40-10:20
**Leopold FÜREDER -** Crayfish hosts and annelid symbionts: consequences from a long-lasting relationship

10:20-11:00
**Mark WILKINSON -** Cold water and hot air: the evolution of lunglessness in amphibians

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

11:30-11:45
**Adrian PASCU -** "Horizon 2020" - New opportunities for research and innovation: general orientation, new instruments and priorities

11:45-12:00
**Aurel Florentin BADIU -** "Horizon 2020" - Food security, sustainable agriculture, marine and maritime research and bio-economy - research topics in national and European partnerships

## Invited speaker

12:00-12:20
**Ion I. DEDIU -** Bioeconomy – a Romanian scientific creation

## Palaeontology

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

12:20-12:35
**Roksana SKRZYCKA, Piotr SKRZYCKI, Paweł RACZYŃSKI, Bronisław W. WOŁOSZYN -** New findings from Carboniferous and Permian strata of Polish part of the Sudety Mountains

12:35-12:50
**Maksim CHEPRASOV, Theodor OBADĂ, Semyon GRIGORIEV, Gavril NOVGORODOV -** New localities of the mammoth fauna in the basin of the Kolyma River (Northeastern Russia)

12:50-13:05
**Katarzyna MIŁEK, Dominika OLSZEWSKA, Bronisław W. WOŁOSZYN -** Was *Myotis alcathoe* present in the Holocene bat fauna from the Tatra Mountains?

***13:05-14:05***
***Lunch break***

## Ecology

### Chair: Ioan SÎRBU (Sibiu, Romania)

14:05-14:20
**Dorina PURICE, Marilena ONETE, Virgil IORDACHE -** Structural characteristics of invertebrate populations from areas polluted with heavy metals (Zlatna, Romania)

14:20-14:35
**Ioan SÎRBU, Ana Maria BENEDEK, Monica SÎRBU, Lorena POPESCU -** Between flood and drought: adaptive responses of mollusc communities to a highly fluctuant complex of habitats, in one of the last lower Danube River flood areas (The Small Wetland of Brăila Nature Park, Romania)

14:35-14:50
**Mariia FEDORIAK, Stepan KOSTYSHYN, Svitlana RUDENKO -** Ground-living spiders in polluted sites of industrial enterprises of Ukrainian cities

14:50-15:05
**Minodora MANU, Raluca Ioana BĂNCILĂ, Marilena ONETE, Virgil IORDACHE -** Ecological investigations between soil mite communities and some environmental variables from urban ecosystems from Romania

15:05-15:20
**Nadejda STAHI, Vladimir BULGARU, Ivan MIRONIC, Elena ERŞOVA, Serghei VASILCIUC, Valentina ZASTÎNCEANU -** Influence of insect defoliators on oak forests in the Republic of Moldova

15:20-15:35
**Eugen NITZU, Radu MOŢ -** Coprophilous beetles (Coleoptera) associated with feces of brown bear (*Ursus arctos* Linnaeus, 1758) in the Carpathians

15:35-15:50
**Marius CICÎRMA, Ştefania IVAN, Anca DINISCHIOTU, Andrea Cristina STAICU -** Histological changes induced by Cocamidopropyl betaine acute intoxication in *Cyprinus carpio* (Actinopterygii, Cyprinidae)

15:50-16:05
**Tudor COZARI, Cristina GIACOMA, Cinzia ZUGOLARO -** The population structure of *Bufo viridis* in Republic of Moldova and Italy

***16:05-16:35***
***Coffee break***

16:35-16:50
**Alexandru STRUGARIU, Iulian GHERGHEL, Paul C. DINCĂ, Ştefan R. ZAMFIRESCU -** Correlations of melanism in the populations of *Vipera berus* complex from eastern Romania

16:50-17:05
**George BOUROŞ, Rocío Hermosilla GARZÓN, Jesús Alberto SÁNCHEZ PARDO -** Feeding habits of the Eurasian otters *Lutra lutra* (Linnaeus, 1758) living in Putna Vrancea Natural Park (Romania)

17:05-17:20
**Grzegorz KŁYS, Bronisław W. WOŁOSZYN -** Loss of body mass in *Plecotus auritus* versus microclimatic conditions of interior during hibernation

## Forensic entomology

### Chair: Rita MAALOUF (Fanar, Lebanon)

17:20-17:35
**Rita MAALOUF, Salman SHAYYA, Cynthia BASSIL -** The importance of Calliphora, Sarcophaga and Coleoptera in forensic investigations in Lebanon

17:35-17:50
**Lavinia IANCU, Cristina PURCĂREA -** Forensic entomology and microbiology – new experimental approach

17:50-18:05
**Kamran AKBARZADEH, Javad RAFINEJAD, Jamasp NOZARI, Yavar RASSI, Mohammad Mehdi SEDAGHAT, Mostafa HOSSEINI -** Biodiversity of forensically important flies in Fars province of Iran

18:05-18:20
**Kamran AKBARZADEH, Javad RAFINEJAD, Jamasp NOZARI, Yavar RASSI, Mohammad Mehdi SEDAGHAT -** Illustrated keys of forensically important adult flies of Iran

18:20-18:35
**Lavinia IANCU, Kamran AKBARZADEH, Luca MANELLI -** An example of international cooperation regarding forensic entomology between three countries – Romania, Iran and Italy

***18:35-18:50***
***Discussions***

***18:50-19:15***
***Poster session***

***19:30-20:30***
***Visit of the permanent exhibition of "Grigore Antipa" National Museum of Natural History***

***20:30-22:30***
***Gala Dinner***

FRIDAY, 22nd OF NOVEMBER 2013

8:30-12:00
**Registration**

## Invited speakers

9:00-9:40
**Ion TODERAȘ -** Immense diversity paradise and universalism of the energy balance components of the animal world

9:40-10:20
**Abdeljebbar QNINBA, Oumnia HIMMI, Mohamed MOUNA -** The National Museum of Natural History of Morocco, Scientific Institute, Rabat: educational and ethical role

10:20-11:00
**Oldřich SYCHRA -** Chewing lice (Phthiraptera: Menoponidae) of the genus *Myrsidea* – its taxonomy and ecology

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

## Parasitism in the animal kingdom

### Chair: Oldřich SYCHRA (Brno, Czech Republic)

11:30-11:45
**Karel DOUDA -** Unionid bivalves as a model group for studying the effects of biotic homogenization on host-parasite relationships

11:45-12:00
**Ioana Cristina CONSTANTINESCU, Gabriel CHIŞAMERA, Khlur B. MUKHIM, Costică ADAM -** Preliminary data on the fauna of feather mites (Acarina: Analgoidea) in Meghalaya (India)

12:00-12:15
**Ana Maria BENEDEK, Ioan SÎRBU, Daniel Cătălin GHEOCA -** Comparative study on ectoparasite infestation within the genus *Apodemus* Kaup, 1829 (Rodentia: Muridae) in relation to their habitat

12:15-12:30
**Stojmir STOJANOVSKI, Lidija VELKOVA-JORDANOSKA, Dijana BLAŽEKOVIĆ-DIMOVSKA, Stoe SMILJKOV, Jelena LUJIĆ -** New findings of parasite fauna of Ohrid moranec (*Pachychilon pictum* Heckel & Kner, 1858) (Teleostei: Cyprinidae) from Lake Ohrid, Macedonia

12:30-12:45
**Dijana BLAŽEKOVIĆ-DIMOVSKA, Stojmir STOJANOVSKI, Lidija VELKOVA-JORDANOSKA, Nikola HRISTOVSKI -** New findings of parasite fauna of endemic salmonid's fishes from Lake Ohrid (Macedonia)

12:45-13:00
**Adriana HIŽŇANOVÁ, Tiberiu SAHLEAN, Juraj ŠENIČ, Božena HAKLOVÁ, Natália KOKOŠOVÁ, Viktória MAJLÁTHOVÁ, Igor MAJLÁTH -** Influence of *Borrelia* and *Anaplasma* on behaviour of lizard genus *Lacerta*

***13:00-14:00***
***Lunch break***

**Chair: Oldřich SYCHRA (Brno, Czech Republic)**

14:00-14:15
**Juraj ŠENIČ, Adriana HIŽŇANOVÁ, Božena HAKLOVÁ, Natália KOKOŠOVÁ, Viktória MAJLÁTHOVÁ, Igor MAJLÁTH -** Thermoregulation of Green lizard, *Lacerta viridis*, parasitized by blood parasites

14:15-14:30
**Alexandru MOVILĂ, Ion TODERAŞ -** Parasite-host interactions *in vivo* between *Borrelia burgdorferi* and laboratory small animals

14:30-14:45
**Mihaela ZĂULEŢ, Vlad PETROVAN, Andrada BÎRLĂDEANU, Cristian NICU, Răzvan C. RĂDUCAN, Ana Maria STOIAN, Laura BUBURUZAN -** Distinctive viral variants of Porcine Reproductive and Respiratory Syndrome in Romanian territory

## Studies and recovery of the natural history museum patrimony

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

14:45-15:00
**Jelena LUJIĆ, Darko RADMANOVIĆ, Zsòfia PECZE, Zoran MARINOVIĆ, Desanka KOSTIĆ -** Conservational methods in preserving animal bones: short review

## Biodiversity Conservation

### Chair: Bronisław W. WOŁOSZYN (Krakow, Poland)

15:00-15:15
**Bronisław W. WOŁOSZYN -** Biodiversity protection, that is a new Noah's Ark – entry on the board only for beautiful, useful and well-known species

15:15-15:30
**Mehmet Zeki YILDIRIM, Ümit KEBAPÇI, Sevda ÖZ, Selda BAKIR -** National parks and public perception of national parks in Turkey: a case study

15:30-15:45
**Mihai Cristian ADAMESCU, Constantin CAZACU, Ovidiu IONESCU, Georgeta IONESCU, Ramon JURJ, Marius POPA, Roxana CAZACU, Ancuța COTOVELEA -** Spatial and time trends based on long term data analysis of mammal populations in Romania

15:45-16:00
**Matei-Ionuţ DRAGOMIR, Adrian-Cosmin STÎNGĂ -** Distribution and habitat selection of wintering birds in the Special Protection Area ROSPA0071 „Lower Siret Meadow" (Eastern Romania)

***16:00-16:30***
***Coffee break***

### Chair: Bronisław W. WOŁOSZYN (Krakow, Poland)

16:30-16:45
**Manuel MENÉNDEZ PUERTAS, Paloma PEÓN, J. Vicente GONZÁLEZ, Bartolomé MUÑOZ -** Successfully managing in an area of the Common Reed (*Phragmites australis*) reduces the effect of environmental variables and improves the conditions of three species of *Acrocephalus*

16:45-17:00
**Egor KIRILLIN, Innokenty OKHLOPKOV, Ruslan KIRILLIN -** Habitat use by muskox *Ovibos moschatus* (Zimmerman, 1780), in Yakutia (Russia)

17:00-17:15
**Teodora SIN, Silviu CHIRIAC, Lucian PĂTRAȘCU, Geta RÎȘNOVEANU -** Habitat suitability modeling for the Grey wolf *Canis lupus* (L., 1758) in Putna-Vrancea Natural Park, Romania

17:15-17:30
**Ioan M. POP, Viorel D. POPESCU, Lajos BERDE, Silviu CHIRIAC -** Comparing two techniques for rapid assessment of Brown bear abundance in Romania

17:30-17:45
**Alexandra SALLAY, Ioan M. POP, Lajos BERDE, Leonardo BERECZKY, Silviu CHIRIAC -** An equivocal relation between demographic structures of harvested brown bears and damage occurrence in the Eastern Romanian Carpathian Mountains

17:45-18:00
**Lucian PĂTRAȘCU, Silviu CHIRIAC, Leonardo BERECZKY, Alexandra SALLAY, Ioan M. POP, Lajos BERDE -** Perspectives for reintroducing physically disabled bears into the wild: the case of a 3-legged-bear

18:00-18:15
**Bronisław W. WOŁOSZYN, Dumitru MURARIU -** Biodiversity of the Horseshoe bats (Chiroptera: Rhinolophidae) at the Alfa and Beta levels in the Carpathians Mts.

***18:15-18:30***

***Discussions***

***18:30-19:30***
***Poster session***

SATURDAY, 23rd OF NOVEMBER 2013

Whole day excursion to ***Prahova Valley*** (*Posada Woodcraft Museum*, *Pelişor Castle*, and *"George Enescu" Memorial House from Sinaia*).

## Poster Presentations

### Taxonomy. Faunistics. Zoogeography

**P 01.**
**Mariia FEDORIAK, Evgeni ZHUKOVETS -** The first records of *Pritha nana* (Filistatidae) and *Oecobius maculatus* (Oecobiidae) from Crimea

**P 02.**
**Seyed Mahmoud SAMADPOUR, Mohammad KHANJANI -** Identification of prostigmatid mites associated with oleaster trees in Hamedan Province, western Iran

**P 03.**
**Masoumeh KHANJANI, Mohammad KHANJANI -** Fauna of the family Raphignathidae (Acari: Prostigmata) in Hamedan Province, Iran

**P 04.**
**Narges FAKHARI, Hasan RAHMANI, Mohammad KHANJANI, Masoumeh KHANJANI -** Fauna of the family Stigmaeidae (Acari: Prostigmata) in Zanjan county, Iran

**P 05.**
**Mohammad KHANJANI, Bahman ASALI-FAYAZ, Saeed JAVADI-KHEDERI -** Faunistic study of the genus *Eustigmaeus* (Acari: Stigmaeidae) in some parts of western and north–western Iran

**P 06.**
**Mohammad KHANJANI, Babak ZAHIRI -** Phoretic, parasitic and predatory mites associated with sucker and borer pests in Hamedan orchards (Iran)

**P 07.**
**Nazila HONARPARVAR, Mohammad KHANJANI, Seyed Hamidreza FORGHANI -** Faunistic study on spider mites in the vicinity of Hamedan, Iran

**P 08.**
**Constanţa-Mihaela ION -** Diversity of centipedes in different types of ecosystems from the Buila-Vânturariţa National Park (Romania)

**P 09.**
**Constanţa-Mihaela ION -** Faunistic data concerning centipedes (Myriapoda: Chilopoda) from Doftana Valley, Prahova county (Romania)

**P 10.**
**Ionuţ POPA -** Collembolan communities (Hexapoda: Collembola) from the Buila-Vânturariţa National Park (Romania)

**P 11.**
**Ioan-Alexandru RĂDAC -** Remarks on several catching methods used in collecting true bugs (Insecta: Heteroptera)

**P 12.**
**Gavril Marius BERCHI -** Water crickets of Romania, with the first record of *Velia serbica* Tamanini, 1951 (Heteroptera: Veliidae)

**P 13.**
**Elena Iulia IORGU, Ionuţ Ştefan IORGU -** Bush-crickets, crickets and grasshoppers (Insecta: Orthoptera) from Berca Mud Volcanoes (Buzău, Romania)

**P 14.**
**Ionuţ Ştefan IORGU -** Bush-crickets, crickets and grasshoppers (Insecta: Orthoptera) from Putna-Vrancea Natural Park (Romania)

**P 15.**
**Ionuţ Ştefan IORGU, Nadejda STAHI, Elena Iulia IORGU -** The Orthoptera (Insecta) from middle and lower Prut River basin

**P 16.**
**Daniel Kazimir KURZELUK -** Four new records for *Trichodes quadriguttatus* Adams, 1816 (Insecta: Coleoptera: Cleridae) in Romania

**P 17.**
**Constantin CORDUNEANU, Cătălin BALAN, Ovidiu-Alin POPOVICI, Ioan SURUGIU -** New records or rare species of Lepidoptera (Insecta: Lepidoptera) from the North-East part of Romania

**P 18.**
**Dănuţ Florinel DRĂGAN, Viorel-Dumitru GAVRIL, Tiberiu SAHLEAN -** Urban ecosystems: preliminary studies regarding the vertebrate fauna of Văcăreşti Lake (Bucharest, Romania)

**P 19.**
**Paul C. DINCĂ, Alexandru STRUGARIU, Ştefan R. ZAMFIRESCU -** A rapid survey of the herpetofauna from the upper Topolog River basin

**P 20.**
**Andrei GIURGINCA, George-Ştefan NĂZĂREANU -** First record of *Sterna hirundo* nesting inside Bucharest

**P 21.**
**Victoria NISTREANU, Natalia CARAMAN, Alina LARION, Vlad POSTOLACHI, Vlad CALDARI, Victoria BURLACU -** Small mammal fauna in forest ecosystems of Kishinev city, Republic of Moldova

**P 22.**
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# INVITED SPEAKERS

# Life history strategies of spadefoot toads (genus *Pelobates*)

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**Key words:** amphibians, life-history, competition, population structure, growth rate.

The spadefoot toads (genus *Pelobates*) are highly specialized burrowing and nocturnal species with a narrow ecological niche. Because of their secretive behavior (nocturnal activity, weak underwater breeding call and cryptic coloration) their life histories are not well documented and overall there is a scarcity of information regarding this genus. Of the four extant species of the genus two have non-overlapping ranges in Western Europe and North Africa while the ranges of the other two species (the Common Spadefoot *P. fuscus* and the Eastern Spadefoot *P. syriacus*) overlap in Southeastern Europe along the lower course of the Danube and the western coast of the Black Sea. Both species reach the limit of their ranges there: southern limit for *P. fuscus* and northern limit for *P. syriacus.*

These populations at the limit of their distribution ranges are especially vulnerable to even slight changes of climate, and, since part of the area of overlap is experimenting increased aridity, this represents a major threat to their persistence. Their study represents an excellent opportunity for the comparative analysis of their life histories, habitat requirements and possible competition. Our main study area is located in the southern part of the Danube Delta Biosphere Reserve, on Grindul Lupilor natural levee.

The two species have similar habitat requirements and use, but differ in body size and sexual dimorphism. *Pelobates fuscus* is smaller in size and it shows a clear sexual dimorphism, with females being larger than males, while *P. syriacus* is much larger in size with males slightly larger than females. At metamorphosis the juveniles do not differ significantly in snout-vent length, but the ratio between the two species *fuscus-syriacus* decreases from 98% in metamorphs to 65% in adults. The changes in body mass are even more impressive from 89% in metamorphs to 24% in adults. We also found significant differences in the age structure of the syntopic populations: *P. fuscus* individuals were on average 5.0 years old (maximum age recorded 8), while *P. syriacus* were on average 7.4 years old (maximum age recorded 12), despite the fact that sexual maturity was similar. The growth rates before and after reaching sexual maturity varied also: male growth rate was higher before reaching sexual maturity in both species, but in *P. syriacus* growth continued at a similar rate even after reaching sexual maturity. The study of their nocturnal activity showed that *P. syriacus* was significantly more active than *P. fuscus* with almost 2.5 overall distance covered and more than

twice the speed achieved, but with approximately the same time spent outside burrows, suggesting that the species differ in patterns of foraging behavior, *P. fuscus* being relatively sedentary ('sit-and-wait') whereas *P. syriacus* is a more active predator ("widely-foraging"). The two species also differ in the tadpoles response to desiccation, toleration to salinity (with *P. syriacus* eggs and tadpoles having a higher survival rate), and post-metamorphosis feeding rates. Our study showed that the different growth rates before sexual maturity and differences in energy allocation between growth and reproduction after sexual maturity are responsible for the differences in size between these two syntopic populations. These cause an ecological differentiation that allows for the co-existence of the two species, with *P. syriacus* being the dominant species.

# Bioeconomy – a Romanian scientific creation

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**Key words:** ecology, economy of naturae, bioeconomy, sustainable development.

The notion of **economy of nature** has a long history and is always present in the ecological and environmental investigations. The term was used for the first time by the outstanding Swedish biologist Carl von Linné (1707-1778) in his dissertation "Specimen academicum de oeconomia naturae…", which was published in Upsala (1749), and was defined as relations among all elements [components] of the nature, on which its equilibrium is based. The same term, without changing its meaning, was used by the founder of geology as a science Ch. Lyell (1830-1833), which was undertaken by his disciple Ch. Darwin (1859). Later on, the notion and the term was utilized by E. Haeckel (1866) as a synonym of ecology. Further, the Romanian scientist Grigore Antipa, one of the founder's student in the field of ecology, had used this quite appropiate and useful notion as a methedological basis of the ecological research of the Danube Delta and of the Romanian Black Sea littoral. Gr. Antipa (1892; 1910; 1912; 1933 a, b), utilizing the biocenotical and bioproductive approach of the natural biosystems created a new science – the **bioeconomy**. Much later (1925), the same term was used (independent of Gr. Antipa) by the Russian biologyst T. I. Baranov. The next two famous Romanian scientists – the economists N. N. Constantinescu (1976, 1993) and N. Georgescu-Roegen (1971, 1979) have approached economy from the biological (bioeconomical) point of view, while Gr. Antipa has developed biology from economical (ecological, ecosystema's) point of view. Historically, the paradigmatic line Linné-Lyell → Darwin → Haeckel → Antipa → Constantinescu → Georgescu- Roegen logically rulled towards the global concept (the philosophy) of sustainable development (i.e. of ecodevelopment), officially approved of by the UN Conference „The Environment and Development" (Rio de Janeiro, June 5, 1992).

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# Crayfish hosts and annelid symbionts: consequences from a long-lasting relationship

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**Key words:** Branchiobdellida, biogeography, aquatic ecology, aquatic conservation, functional role.

Crayfish are the largest invertebrates in our freshwater ecosystems with the consequence of playing an important role within the aquatic communities. Where environmental conditions are favourable for crayfish growth and production, they may develop high densities and biomass. This led to people's interest in crayfish as a potential food source already in the Middle Ages and resulted in intensive trade of these organisms in whole Europe. Although the reasons for crayfish translocation may have changed considerably, today's distribution patterns are a consequence of these activities but also of man-induced changes and destructions of crayfish's habitats. Annelid worms of the order Branchiobdellida are ecto-symbionts on Northern hemisphere crayfish species. As exclusive crayfish symbionts branchiobdellid species distribution should match the biogeography of their hosts. Besides a scarce knowledge on the branchiobdellid occurrence, even less is known on host-symbiont relationships or the ecological/biological role of the symbionts. In order to test the hypothesis that symbiotic Branchiobdellida are adequate indicators for explaining crayfish populations' origin and condition we present results about crayfish-annelid association from 25 freshwaters and provide information on i) the distribution, species number and abundances on the three indigenous crayfish species *Astacus astacus*, *Austropotamobius pallipes* and *A. torrentium*, and ii) the relation of these findings with crayfish population characteristics and environmental conditions of their freshwater habitats. Our results on branchiobdellid's preferred location on their host, their jaw morphologies combined with stable isotope signals were used to provide a first picture of their functional organisation. Our results provide evidence that the herein used traditional and molecular tools, when applied on a larger scale may help to elucidate the complexity of this long-lasting relationship.

# Mollusk population changes at the Romanian Black Sea coast

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**Key words:** Mollusca, NW Black Sea, macrozoobenthos, numerical density, biomass.

Based on the researches carried out in the last 10 years on the specific structure and quantitative richness of zoobenthos populations in the NW sector of the Black Sea, as well as on the information from literature, the author makes comments on the changes in the mollusk fauna of the Romanian shelf.

The benthos researches revealed the transitional process of the bottom communities, including mollusks populations, from the severely disturbed state caused by ecological pressures during the period 1970-2000 towards a new state.

The author and his scientific team (Dr.Tatiana Begun, Dr. Adrian Teaca and others), with their expertise achieved in the framework of several projects (SESAME, HYPOX, PERSEUS), consider that the benthic associations mainly influenced by the Danube River discharge can be characterized as follows:

- decrease in specific diversity (e.g. Mollusca – from 170 species in the 1960s–1970s to 70 species at present in NW Black Sea);
- loss or diminishing of some habitat areas (typical habitat with *Zostera*, *Phyllophora*, *Cystoseira, Barnea, Donacilla* etc.);
- increase in the numerical abundance and biomass of some specific benthic populations of deposit-feeders (*Melinna, Alitta, Dipolydora* etc.);
- loss or reduction of some specific populations (*Abra prismatica, Spisula subtruncata, Chamelia gallina* etc.);
- replacement of some strong and quite large benthic populations by metapopulation with limited distribution;
- diminution of biofilter strength by reduction of the filter – feeder populations, mostly bivalves;
- qualitative and quantitative worsening of benthic biological resources, especially molluscs - forms with an important ecological part and great economic importance (Mussel *Mytilus galloprovincialis*, Soft-shell clam *Mya arenaria*, Veined rapa whelk *Rapana venosa*);
- thriving of opportunistic forms (especially worms populations causing sediment bioturbation – *Melinna palmata, Heteromastus filiformis*) and, temporarily, some exotic species recently pervading the Black Sea (*Mya, Anadara, Rapana* etc.);
- great quantitative fluctuations of all benthic populations;
- occurrence of some weak signs of ecosystem recovery.

However, the rapid recovery of the benthic ecosystem, especially the mollusk populations, appears to be less certain although an improvement of some benthic biota is suggested by the available data.

The process of the Black Sea recovery will last long and require implementing all measures envisaged by the Black Sea Strategic Action Plan in the frame of

an adaptive management and will also involve uncertainties. The process will be complicated further by the fact that scientific knowledge and information on many processes and phenomena, necessary for policy and decision making, are missing.

The future conservation of the Black Sea biodiversity in the context of climate change and the present state of socio-economic system of the Black Sea Region (environment-related science and policy) supposes approaching the following main issues:

- uncertainties under global climate change conditions;
- difficulties in predicting changes and consequences;
- natural and economic values in dispute;
- high stakes and urgent decisions;
- necessity of more research on the cross-sectoral measures, including their impact, inter-relationship and inter-dependence;
- necessity of integrating the socio-economic system with the natural environmental system.

# Natural history collections and integrated view on the mammalian diversity in South-Eastern Europe

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**Key words:** glacial refugia, biodiversity patterns, elevational gradient, biodiversity hot spots, endemism, museum collections.

I will briefly review the state of art in mammalian biodiversity research in South-Eastern Europe (SEE): how well the patterns are documented and what we know of the underlying process. Because my career was always closely linked to the museum work, I will address the current situation in natural history collections using mammal collections in SEE as an example. Doing so, I will not be able to avoid funding of biodiversity research but my view will certainly involve heavy bias.

No attempt has been made so far to prepare a synthetic view of the mammalian fauna of SEE. Despite this, we understand fairly well spatial patterns in mammal species richness in the region. Hot spots coincide with the mountainous regions along the Adriatic and the Ionian Sea, and the Balkan Mts. in Bulgaria. The coastal mountains are also center of endemism and further endemics occupy the Carpathian Basin and Thrace. As long as rodents are concerned, the SEE is recognizable within the continent by a markedly high level of endemism; noteworthy, species richness shows very different spatial pattern. Large scale comparisons provided contradictory results, either claiming that mammal species richness in the continent either peaks in Central Europe, or in SEE. To avoid confusion, one first has to define what kind of species diversity (alpha, beta, or gamma) is studied. Therefore, the scale of observation is important in assessing species richness. I approached this issue by applying the familiar species-area relationship (Arrhenius equation) in comparing Central Europe and SEE. In log-log plot of species richness against surface area, the two regions fit lines of different slope and intercept. Evidently, these regions contain mammalian faunas of very different histories. Furthermore, very small regions of single biotas (surface area < ~$10^4$ km$^2$) seem to be more species-rich in Central Europe, but the SEE accumulates species at a faster rate. A re-plot of data in an arithmetic space clearly shows that the curve of the SEE small terrestrial mammals rises fastest, while that of Central Europe rises slowest.

Alpha and beta species richness are poorly documented in SEE, but the situation elsewhere in Europe is only rarely better. Although the relationships between species richness and elevation is inherent in mountain ecosystems, and SEE is predominantly mountainous region, surprisingly little attention was devoted to patterns along elevational gradients. Worldwide this topic attracted considerable attention because of general interest on the role of geographical constraints in shaping patterns of species richness simply by preventing species from extending their ranges below these limitations. Most data sets on diversity

along elevational gradients analyzed thus far are from the tropical latitudes, while temperate regions remain undersampled in this regard. Rigorous testing of hypotheses requires data gained in a standardized sampling design, which is labor intense and therefore too expensive for majority of research groups which are under heavy pressure for publishing in high-impact journals. Majority of our knowledge on small-scale species richness steams from "gamma samplings" which are mainly based on compilations of species richness derived from published sources or museum collections and frequently involve sampling bias. Detailed studies of alpha diversity along gradients are financially not feasible.

One research topic which bloomed in SEE over the last decade is phylogeographic assessment using molecular markers. Phylogenetic analysis of (in mammals primarily mitochondrial) DNA has revolutionized research on spatial patterns of evolutionary diversification worldwide in general and in SEE in particular. During the Quaternary glacial-interglacial cycles, the associated climate changes have caused repeated range shifts in most European taxa, including mammals. Historical processes of divergence, population changes, persistence and migrations have all left their footprints on the genealogies of DNA sequences which make them traceable. The importance of southern peninsulas as major glacial refugia for taxa that are now widespread was retrieved already in traditional zoogeographical and taxonomic studies. Research of nucleotide sequences however opened entirely new horizons. The main message is that the SEE refugium, similarly as the remaining traditional southern refugia, acted as a center of endemism rather than a source for re-colonization of Europe after the Last Glacial Maximum. Next, the long-term geographical persistence of SEE endemics generated strong genetic differentiation on a small geographical scale through multiple refugia. Existence of multiple refugial areas within the SEE is not surprising given its topographical complexity. And finally SEE endemics have sister species in other refugial areas. There is only one single case in mammals of evolutionary divergence into two species within the SEE refugium.

It is beyond doubt that molecular genetics will remain a widely utilized tool in mammal research also in the future. However, no matter how powerful this kind of analysis is, we zoologists are interested in animals, not on genes. Understanding organisms is a complex task which cannot be satisfactorily achieved merely by studying one single data set. A holistic approach is required but it is only rarely performed. Morphological analysis is one such neglected issue. In recent decades, there has been a proliferation of new methods in morphometrics, particularly those where analyses of landmark data are concerned. This kind of morphometric analysis (geometric morphometrics) incorporates strong elements of quantification and hypothesis testing, and should be regarded as an integral part of any approach in evolutionary research. Because samples must be split into homogenous age and sex groups in morphometric studies, large number of animals must be collected from populations in nature. This is expensive on its own, but may also rise ethical and conservation concern. To make it short, a competent morphometric analysis in mammals normally depends on material stored in natural history collections.

Natural history collections, zoological in particular, are frequently archived in natural history museums (NHM). Many museums accumulated artifacts of

nature and associated information over long period of time and are in possession of millions of items. Faced with revolution in informatics, museums are expected to catalogue their collections digitally and to digitalize their specimens. Some collection managers fear that these changes will end scholarly interest in collections and put their status and condition at risk. In addition, more and more curators employed in natural history museums work primarily in laboratories instead of collections. And finally, general public does not care much about the value of collections which are kept far away of its sight. Wikipedia defines a NHM as "a museum with exhibits about natural history". To someone who spent his/her career in NHM the definition will certainly sound deficient and inadequate. Indeed, it captures only one segment of a museum's work, but it is the only one of which general public is aware. But, can we afford to build an integrative view on biodiversity without the natural history collections? I do not believe so. Do we have in SEE functional and healthy natural history collections? In my experience with mammals the answer cannot be unconditionally "Yes". Very recently, one national museum in SEE with internationally important natural history collections was shut down, while in another one the funds were cut drastically. Therefore we must improve the standards of natural history collections by ourselves. We have to convince funding agencies and the public, that our mission is important for the future. Nobody else will do it instead of us. So, let's start!

# How do new species arise?

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**Key words:** species, speciation, biodiversity, evolution.

Currently, millions of species live on earth. How to explain this diversity and how all this wonderful variety arose? For a long period of time, biologists have admitted Darwinian selection as the main argument of continuous adaptation and balanced evolutionary modification. The biological species concept describes a species as members of populations that really or potentially interbreed in nature. Speciation is a lineage-splitting episode that generates two or more distinct species. How geographical, ecological, evolutionary, and genetic factors interact to draw up two species out of one? How new species appear they from those preexisting? From 1950 to early 2000, traditional theories of speciation highlighted geographic isolation: an impassable physical barrier separates one population into two, and each sub-population then evolved independently, forming, over time, two different species. However, today, this dogma is contested. Using new and more complex speciation models (taking into account more parameters, for example, the genetic basis of each feature, action of selection or population demographics) it was showed that two species may diverge even without geographical separation. Moreover, under realistic conditions, it is possible the emergence of a speciation process in the presence of gene flow. The main aim of this lecture is to describe the contemporary achievements of experimental speciation research in order to better understand some features of the evolution of life on Terra.

# The National Museum of Natural History of Morocco, Scientific Institute, Rabat: educational and ethical role

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**Key words:** museum, natural history, collections, education, Rabat, Morocco.

The National Museum of Natural History of the Scientific Institute has three main functions, namely (i) the preservation and conservation of natural components, (ii) the establishment of collections of studies and (iii) education and awareness.

Without museums, a whole heritage would be lost forever. Hence it is always important to remind that many plants and animals disappeared from the surface of the globe in general and Morocco in particular or those endangered are stored in the NMNH for the training of future generations. Indeed, to keep memory of natural components lost nationally, it is absolutely necessary to deal with the conservation of animals, plants, fossils, rocks and minerals. This is sort of a static reserve to know, appreciate and take a close look to the beauty of our ecosystem components and become aware of their preservation.

Since 1989, we focused on the development of the educational role of NMNH of the IS which aspects are diverse. An important aspect of this public service consisting of sample exhibitions for public, schoolchildren, students and staff of National Education in particular. Indeed, the Museum exhibition allow students to better illustrate their theoretical natural science courses. The organization of free visits or visits supervised by researchers at the Scientific Institute aims to better know to protect. In addition, the beauty of the exhibited samples also plays an ethical role.

We will present our experience in education for over two decades. The means used to convey the message to future generations will be discussed in order to better understand the mechanisms that rule biodiversity for a reasonable and adequate use for sustainable development.

# Chewing lice (Phthiraptera: Menoponidae) of the genus *Myrsidea* – its taxonomy and ecology

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**Key words:** chewing lice, *Myrsidea*, morphology, parasitology, louse-host associations.

*Myrsidea* is the most speciose menoponid genus with species parasitic on passerines mainly. It currently comprises 353 recognized species occurring throughout the world, with 334 of them recorded from 368 host species in 47 families of Passeriformes, 12 species from 14 species of toucans (Piciformes: Ramphastidae), 3 from 3 species of hummingbirds (Apodiformes: Trochilidae), and 4 species *incertae sedis* from 4 hosts, most likely erroneous. *Myrsidea* species are a good example of highly host-specific lice, with 80% of them being restricted to one host species. The remainders are found on a few host species, with only a single instance of an overlap between host families. Although there has been no comprehensive study of the entire genus due to the large number of species involved, available evidence suggests that each host species or group of closely related host species is parasitized by one or more closely related species of *Myrsidea*. Therefore, the only practical manner to deal with the taxonomy of such a large genus is to treat lice from each host family as a unit. There are about twenty important characters useful in separating species and, while most species are more easily identified with females, males may show characters needed for phylogenetic analysis. Species of *Myrsidea* grouped together by characters of the male genital sclerite are frequently found to be parasitic on a group of related hosts, usually one family. Males and females of a given species may have few characters in common and only one sex may be identifiable; therefore, it is unsatisfactory to describe new species based on only one sex.

A total of 6564 individuals of 482 species of passerine birds were examined between the years 2004 and 2013 at various locations in Central Europe, Africa, the Neotropical Region and Vietnam. A total of 663 birds (prevalence = 10.1%) of 141 species were parasitized with 3648 chewing lice of the genus *Myrsidea* (mean intensity = 5.5 lice per bird). Prevalences of *Myrsidea* in different geographical regions ranged between 1.0% (Central Europe) and 27.3% (Neotropical Region). *Myrsidea* was found as eudominant genus with a total dominance of 24.3% (n = 15030). Dominance of *Myrsidea* ranged between 0.9% (Central Europe) and 51.8% (Neotropical Region).

A total of 93 (66%, n= 141) records represent new host-louse associations. We found examples of bird species harboring two different species of *Myrsidea*. In these cases, each species was found either in a different geographical location or in the same location but on different host individuals. Conversely, we found also examples of one species of *Myrsidea* parasitizing two different host species. Such host-switching events between unrelated hosts are possible at a given location, if the birds share similar behavior and ecology. The most interesting

example of host-switching is the record of *M. claytoni* from the black-and-red broadbill (*Cymbirhynchus macrorhynchos*) in Vietnam. While the type hosts of *M. claytoni* belong to the family Pycnonotidae, *C. macrorhynchos* is a member of the family Eurylaimidae representing the Old World Suboscines, which are considered as a basal lineage among passerines.

Our findings highlight the need to (1) carefully examine each louse specimen when identifying new samples of *Myrsidea*, (2) compare them with species of *Myrsidea* from the same and related host families, and (3) compare them with species of *Myrsidea* from unrelated hosts living in the same geographical region.

# Immense diversity paradise and universalism of the energy balance components of the animal world

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**Key word:** diversity, evolution, energy balance.

According to recent official estimates, diversity of the living world, except certain microorganisms, constitutes 8.7 million species, of which, over 20.000 are considered endangered (Chapman, 2009). So far, only one million and 899.600 species (14.1 %) of all plants and animals on Earth have been described and cataloged. Among them, approximately 25 % inhabit aquatic environment. Spectacular is the diversity of uni- and pluricellular animal world, with a quote of 77 % of all living organisms. Regarding evolution of eukaryotic organisms, protozoan combine cellular level of organization (a single cell body) with functional level (the organism has all vital functions characteristic to metazoan). While, for the protozoans, the vector of progressive evolution is characterized by polymerization of organelles (protoplasmic differentiations), then, contrarily for metazoans, in the process of evolution occurs oligomerization of homologous organs (Polyansky, 1972; Polyansky & Raykov, 1977). Unique, similar to sporophyte plants, case in animal kingdom of haploid and diploid generation's alternation during sexual reproduction, attested in Foraminifera, as well as facultative autotrophic nutrition in Flagellate serve as phylogenetic bridges between animal and vegetal kingdom. The processes of morphological and functional adaptation of parasitic organisms are also typical for Protozoa compared with Metazoa.

Paradoxically however, for the great diversity of living organisms, including animals, bioenergetic processes are common. In the present detailed communication, universal bioenergetic processes are confirmed by analyzing the components of energy balance of poikilotherm animals with different levels of biological organization.

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## Cold water and hot air: the evolution of lunglessness in amphibians

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**Key words:** buoyancy, cutaneous gas exchange, comparative anatomy, tropics.

Consider how useful the potential for pulmonary gas-exchange is in the life of both terrestrial and aquatic lunged-vertebrates. Lungs seem essential for sustained high metabolic rates of endotherms. Even if lungs are used only rarely, they may permit survival when, for example, environmental conditions mean there is insufficient dissolved oxygen for alternative surfaces to satisfy an animal's demands for oxygen and for eliminating carbon dioxide. Thus lunglessness is an unusual feature and it is perhaps not surprising that lineages lacking lungs have evolved from lunged ancestors only a few times, and only ever within the amphibians, a group characterized by its exploitation of a variety of surfaces (lungs, gills, skin, buccopharyngeal lining) for gas exchange. Lunglessness has long been known in salamanders. The Plethodontidae is the most speciose family of salamanders, and the only one to have radiated in the tropics, and yet all plethodontids are lungless. More recently there have been discoveries of lunglessness in the two other amphibian Orders: in frogs and in caecilians. A 'classical' hypothesis for the evolution of lunglessness in salamanders explains it as an adaptation to reduce disadvantageous buoyancy in fast flowing waters. This hypothesis was first seriously challenged in the 1990's generating a healthy debate prior to the discoveries of lungless frogs and caecilians, including whether lunglessness evolved on land or in water. I will review the arguments in the debate, discuss the implications of the more recent discoveries of lungless caecilians and frogs, and reveal some important new findings regarding the ecology of the giant aquatic lungless caecilian *Atoetochoana* and the true nature of the most recently discovered tiny terrestrial lungless caecilian *Caecilita* that are highly relevant to my central question "is there a general explanation for the evolution of lunglessness?". I will argue that the reduced disadvantageous buoyancy hypothesis provides a plausible, if not uncontroversial explanation for the evolution of lunglessness whenever this has occurred in the Amphibia.

# ORAL PRESENTATIONS

# Zoogeography of slugs in the Mediterranean Basin: palaeogeographical implications

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**Key words:** Limacidae, Agriolimacidae, Mediterranean, Zoogeography, Palaeogeography.

Mediterranean Basin is a diversity center for several family groups of slugs, which include some major pests and noxious species worldwide. Superfamilies Limacoidea and Parmacelloidea for instance, consisting of 6 slug families in total, have apparently paleomediterranean origins. Enigmatic family Testacellidae of mainly Neotropical Testacelloidea and *Papilloderma altonagai* forming Papillodermatoidea are endemic to Iberia and Western Europe, an episodically insulated area especially during Paleogene, when the arrival of Helicoidean Arionidae is estimated to take place. During Late Oligocene and Early Miocene, the Anatolian Plate was in contact with the Asian and at times with European mainland, enabling faunal exchanges. Zoogeography of the basin started shaping during the Early Miocene with the formation of Alps, Dinarides, Carpathians, Balkan Mountains and the Taurus ranges, which remained as isolated archipelagoes during the Middle Miocene period. The slug families Milacidae, Limacidae and Agriolimacidae may have diversified during this period as these mountains show great generic endemism. To the east, being largely isolated from surrounding areas, the Caucasus Mountains possess a refuge character. Two families, Boettgerillidae and Trigonochlamydidae are endemic to the mountains and nearby areas. Likewise, Macaronesian Islands preserves Miocene relict Parmacellid taxa. Before the opening of the Aegean Sea, connection between Balkan Peninsula and Anatolia persisted through the Southern Arc. However, during late Tortonian epoch, Aegean Sea was opened and it separated Europe from Eastern Mediterranean area. The occurrence of numerous land bridges during the Messinian (7.246–5.332 mya) may have initiated colonization of continental islands and probably also remote islands like Corsica, Baleares and Cyprus. Also during the Messinian crisis, a connection between Apennine Peninsula, Iberia and Northwestern Africa occurred. The Pleistocene climatic undulations are responsible for the scattered distribution patterns of many montane endemites. Some disjunct distributional patterns, however, seem to result by old to modern period introductions.

# Is *Eunereis longissima* (Polychaeta: Nereididae) a new record for the Romanian Black Sea coast?

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**Key words:** Black Sea, Polychaeta, Nereididae, *Eunereis longissima*, morphology.

During a study of the polychaete collection of the "Grigore Antipa" National Museum of Natural History, Bucharest (MNINGA), five specimens belonging to *Eunereis longissima* (Johnston, 1840) were identified among *Nereis zonata* Malmgren, 1867 material. The largest specimen is complete, measuring up to 67 mm long and 2.2 mm wide for 119 chaetigers. The colour of preserved specimens is brown-yellowish, without pigmentation. Some individuals presented oocytes in the coelom starting from chaetiger 44–52. Eyes are hardly visible, arranged trapezoidally at the posterolateral margins of prostomium. Paragnaths, whose arrangement on the eversible pharynx is one of the most important diagnostic characters for nereidids, were not observed. However, in the literature it is reported that in *Eunereis longissima* the paragnaths can be easily dislodged. Starting from chaetiger 45–52 in notochaetae appear 1–2 stout characteristic homogomph falcigers. Homogomph falcigers in notopodia are also characteristic for *Nereis zonata*. However these two species are very distinct ecologically. Thus *Eunereis longissima* is known to inhabit muddy sediments with *Mytilus galloprovincialis* and *Modiolula phaseolina* from 25–80 m depth (Winogradow, 1949; Kisseleva, 1981), whilst *Nereis zonata* occurs on rocky seabed at depths less than 20 m. Despite being reported as frequent (but not abundant) at depths greater than 50 m, *Eunereis longissima* was not yet identified off the Romanian Black Sea coast (Begun et al., 2010). Because of improper labelling (lack of locality information, collection date and name of the collector), the question is raised about the presence of *Eunereis longissima* at the Romanian Black Sea coast.

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# Zoogeography of epigean freshwater Amphipoda (Crustacea: Malacostraca) of Romania

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**Key words:** zoogeography, distribution, Gammaridae, Niphargidae, Crangonyctidae.

The epigean freshwater amphipod fauna of Romania, although diverse, has been scarcely studied. Distribution of taxa was sketchy and therefore it was difficult to draw biogeographical conclusions. In this study we aim to fill this gap with extensive new data and provide up to date distribution maps of the epigean freshwater species inhabiting this country. Up to the present date, there are 11 formally recognized species present in Romania belonging to 3 genera, each representing another family: *Gammarus* (Gammaridae, 8 species), *Niphargus* (Niphargidae, 2 epigean species) and *Synurella* (Crangonyctidae, one species). There are at least 3 species that are morphologically distinct and await formal description (2 of them temporarily named *G.* cf. *kischineffensis* and *G.* cf. *fossarum*) and one subspecies deserving elevation to a specific rank (*G. dacicus*). However, the presence of genetically highly divergent cryptic lineages within *G. balcanicus* suggests further diversity and putative new species. *Gammarus* species prevail particularly at higher elevations and display patchy, vicariant distribution patterns, some of them being reminiscent of Late Tertiary geological processes; hypothesis supported by recent molecular analyses. In contrast with *Gammarus*, the genera *Niphargus* and *Synurella* have largely overlapping distributions and are widespread throughout the lowlands. Among the two epigean *Niphargus* species, *N. valachicus* is the most common and is present in the western plains and co-occurs with the rarer *N. hrabei* in southern Romania, both reaching the Danube Delta. This distribution pattern mirrors the extent of the Paratethys Sea during the Late Miocene, and it has been hypothesized that *N. valachicus* invaded freshwaters through coastal lagoons in that period. *Synurella ambulans* is sympatric and often coexists with *N. valachicus*. The mosaic distribution of epigean freshwater amphipod species in Romania is noteworthy, suggesting that this region is particularly well suited for focused phylo- and biogeographical analyses.

# Review of the genus *Myrmozercon* Berlese (Acari: Laelapidae)

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**Key words:** Laelapidae, Myrmozercon, ants, taxonomy, Iran, myrmecophiles.

Many Laelapidae species have been reported from ants or their nests. The genus *Myrmozercon* myrmecophiles includes 26 described species from Europe, Australia, Africa, Middle East, Transcaucasia, North America and Central Asia (Hunter & Hunter, 1963; Rosario & Hunter, 1988; Karawajew, 1909; Vitzthum, 1930; Walter, 2003; Shaw & Seeman, 2009; Trach & Khaustov, 2011; Joharchi et al., 2011; Ghafarian et al., 2013). Only fourteen species of Myrmozercon have been described from the Palaearctic Region. All species are associated with ants, except for one quarantine interception on plant material (Hunter & Hunter, 1963). Myrmozercon robustisetae Rosario & Hunter, 1988 was described from a termite nest, but this species is now known to belong to the termitophilous genus *Urozercon* Berlese, 1901 (in Berlese & Leonardi, 1901) (OConnor & Klimov, 2004). The only species known from western Asia and eastern Europe are *M. ovatum* Karawajew, 1909 (suspected synonym of *M. brevipes* in Ghafarian et al., 2013), from Turkmenistan, *M. tauricus* Trach & Khaustov, 2011, from Ukraine and Iran, *M. karajensis* Joharchi et al., 2011 and *Myrmozercon cyrusi* Ghafarian & Joharchi, 2013, *M. crinitus* Joharchi, 2013 and *Myrmozercon michaeli* Joharchi, 2013 from Iran. Myrmozercon has not been recorded from South America, China, India, southeast Asia, Canada and southern Africa. Maybe that is the reason which reflect a poor sampling effort for myrmecophilus mites in these countries. Also, Trägårdh (1906) described several species of myremcophilous Laelapidae from southern Africa, but his descriptions are brief and lack illustrations. Some of these species may belong to Myrmozercon, but we have not had the opportunity to examine the types to confirm their identification because his type specimens have been lost. It should be noted that the distribution of Myrmozercon species could be probably influenced by their host specificity.

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# New data on the crickets and grasshoppers (Insecta: Orthoptera) from Dobrogea (Romania)

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**Key words:** Orthoptera, Dobrogea, Romania, bioacoustics, faunistics, distribution.

From 190 species of bush-crickets, crickets and grasshoppers (order Orthoptera) currently known to occur in Romania, 110 species (57.89%) are found in Dobrogea. Due to its particular climate, Dobrogea represents the north-eastern distribution area limit in the Balkans for some very interesting species: *Tylopsis lilifolia* (Fabricius), *Isophya hospodar* (Saussure), *Isophya longicaudata* Ramme, *Saga gracilis* Kis, *Callimenus macrogaster* (Lefebvre), *Bradyporus dasypus* (Illiger), *Arachnocephalus vestitus* Costa etc. and the south-western limit for some Eurasian species: *Phaneroptera gracilis* Burmeister, *Gampsocleis schelkovnikovae* Adelung, *Gryllotalpa unispina* Saussure etc. A particular endemic species, *Isophya dobrogensis* Kis lives only on a small island in Danube Delta Biosphere Reserve.

Although there is a substantial literature data and a comprehensive knowledge on Romanian Orthoptera fauna from Dobrogea, three more species have been found in the past years: one ant-cricket from family Myrmecophilidae and two grasshoppers belonging to family Acrididae.

A cosmopolitan distributed genus, *Myrmecophilus* Berthold comprises about 60 species of kleptoparasitic ant-loving crickets. In 2008, during a collecting trip in Southern Dobrogea, we found the first individuals in ant-nests of *Crematogaster* sp. and *Tetramorium* sp. Recently, we discovered another large population in northern Dobrogea, living with *Lasius* sp. and *Tetramorium* sp.

*Aiolopus* Fieber includes grasshoppers widely spread in Europe, Asia and Africa, while *Stenobothrus* Fischer is more restricted to Europe, W Asia and NW Africa. In September 2013, two new species were added to the checklist of Orthoptera from Dobrogea.

# Distribution and acoustics of *Isophya* species (Insecta: Orthoptera: Phaneropteridae) in eastern and northern Romania

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**Key words:** Orthoptera, *Isophya*, Romania, acoustics, distribution.

*Isophya* is the second largest Phaneropteridae genus in Europe, comprising more than 45 species. There are 19 species known to occur in Romania and 16 of these were collected in eastern and northern Romania.

*Isophya camptoxypha* (Fieber) populates mesophytic meadows in the Subcarpathians, northern, central and southern Eastern Carpathians. *Isophya ciucasi* Iorgu & Iorgu is known only from Ciucaş and Vrancea Mountains; *Isophya posthumoidalis* Bazyluk occurs in Maramureş Basin. Closely related to the first three species, *Isophya sicula* Orci, Szövényi & Nagy, *Isophya dochia* Iorgu and *Isophya nagyi* Szövényi, Puskás & Orci populate highlands in central and northern parts of the Eastern Carpathians. Another mountain species, *Isophya pienensis* Maran, lives in northern and western parts of the Eastern Carpathians. The bush-cricket *Isophya stysi* Cejchan is known only from the surroundings of Izvorul Muntelui Lake, western, central and southern Suceava plateau. The northern part of the Moldavian plateau is populated by the interesting *Isophya kraussii moldavica* Iorgu & Heller, while its relative, *Isophya zubowskii* Bey-Bienko, occurs in eastern, central and southwestern Moldavia, northern Dobrogea and southeastern Muntenia. *Isophya dobrogensis* Kis occurs in the Danube Delta Reserve; *Isophya speciosa* (Frivaldszky), *Isophya longicaudata* Ramme and *Isophya hospodar* (Saussure) inhabit central and southern Dobrogea. *Isophya modesta* (Frivaldszky) and *Isophya rectipennis* Brunner von Wattenwyl occur in Dobrogea and Muntenia.

As songs in *Isophya* species highly vary by species, all the species from Romania can be easily recognized by oscillographic analysis. These insects produce isolated or grouped syllables – impulse series, sometimes divided in clear opening and closing hemisyllables, followed or not by after-clicks. Few species sing two different syllable types.

# First record of the genus *Dorypteryx* Aaron, 1883 with *Dorypteryx domestica* (Smithers, 1958) (Psocoptera: Psyllipsocidae) in Romania

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**Key words:** Psocoptera, Psyllipsocidae, *Dorypteryx domestica*, new genus and species in Romania.

The number of known Psocoptera in the world is more than 4400 species with 41 families and 371 genera (Lienhard & Smithers, 2002). Some psocids have their life cycle in ground litter but many species can be found on rocks and in the nests of birds, rodents and termites. Few species have been found in the feathers and fur of birds and mammals, Psocoptera being a sister group with Phthiraptera with very close phylogeny. Psocids can be also found on herbs and grasses, in moss or even in caves. Some species can be found in domestic habitats like granaries, food stores, museums and human houses where can use a large variety of foods.

From Romania, around 70 species of psocids (Lienhard & Smithers, 2002) were identified. Psyllipsocidae family contains five genera: *Dorypteryx* Aaron, *Khatangia* Vishnyakova, *Pseudorypteryx* Garcia Aldrete, *Psocathropos* Ribaga and *Psyllipsocus* Selys-Longchamps but from Romania only one genus was mentioned, *Psyllipsocus*, with one species: *Psyllipsocus ramburii* Selys-Longchamps (Lienhard & Smithers, 2002). The genus *Dorypteryx* comprising only four species: *D. pallida* Aaron, *D. longipennis* Smithers, *D. yunnaica* Li & Lu and *D. domestica* (Smithers). *Dorypteryx domestica* was described in 1958 by C. N. Smithers from Southern Rhodesia (now Zimbabwe) and recorded in Europe in 1973 and until now found in 13 European countries (Belgium, Great Britain, Croatia, Finland, France, Germany, Hungary, Italy, Luxembourg, Poland, Spain, Sweden and Switzerland), Romania becoming now the fourteenth country where this species is mentioned. The only one country bordering with Romania where *D. domestica* was recorded is Hungary and other two relative closest countries are Poland and Croatia.

*Dorypteryx domestica* was described as brachypterous and flightless but Kučerová (1997) described a macropterous form obtained in laboratory culture from brachypterous parents. Wing polymorphism of this species looks to be accentuated in macropterous but also in brachypterous forms. In Romania we recorded just brachypterous specimens.

*Dorypteryx domestica*, as suggested the name, were described from human houses but sporadic records are also known from food factory, stored grain and even from open nature. In a study recorded in Madrid (Baz & Monserrat, 1999), *D. domestica* was associated with *D. pallida*, *Psyllipsocus ramburi*, two species of *Lachesilla* and five species of *Liposcelis*. In Romania we found *D. domestica* only in association with *Liposcelis divinatorius*. *Dorypteryx domestica* was found especially in bathrooms where all life stages can be found, the humidity being a limitative factor for psocid growth, survival and fecundity. Bathroom

psocid populations can serve as sources of individuals invading other rooms, especially kitchens.

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# New data on the *Tephritis maccus* species group (Diptera: Tephritidae) in the Palaearctic region

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**Key words:** Iran, Palaearctic, fauna, Tephritidae, *Tephritis*.

The genus *Tephritis* Latreille belongs to the tribe Tephritini of the subfamily Tephritinae. With over 150 described species, *Tephritis* is one of the largest genera of the family Tephritidae, occurring in the Holarctic, Oriental and Afrotropical Regions; Korneyev and Dirlbek (2001) described *T. urelliosomima* from Iraq and Turkmenistan and placed it with *T. maccus* Hering in a small and monophyletic *maccus* group of species. Then, *T. sophus* Gentilini and Korneyev was described from the Upper Miocene bituminous marles of Italy (Gentilini et al., 2006). *Tephritis maccus* species group can be recognized by the following combination of characters: wing pattern radiate; basal cells hyaline; pterostigma brownish without hyaline spot; apical fork connected to main wing pattern; $r_1$ without or only with one large hyaline spot or indentation on anterior margin of wing (sometimes an additional small hyaline spot present in males); crossvein r-m in dark area; aculeus moderately broad, sharply narrowing and pointed at the very apex; the latter character occurs only in *T. maccus* species group. As a result of studies on the tephritid flies fauna in Iran and Azerbaijan, two new species of the *T. maccus* species group were collected from asteraceus plants.

*Tephritis azari* differs from *T. maccus* by the short brown ray in cell dm basal to the level of r-m, absent or usually reaching only mid-width of cell dm, at most reaching $Cu_1$. In addition in both sexes of *T. azari* there is a large hyaline spot present in cell $r_{4+5}$ at the level of dm-cu. *Tephritis* sp. n. is similar to *T. urelliosomima* but in latter species cell dm is completely brown. *Tephritis azari* Mohamadzade & Korneyev, collected on *Senecio vulgaris* and *Tephritis* sp. n. collected on *Artemisia* sp. but the host plants of the *T. maccus* species group still remain unknown.

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# On the true identity of *Calamotropha olarui* Nemeș, 1972 (Lepidoptera: Crambidae)

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**Key words:** Crambidae, revision, type-specimens, Romanian fauna.

Reviewing the type specimens preserved in the Prof. Ioan Nemeș Lepidoptera collection (Museum of Natural Sciences Dorohoi) occasioned the retrieval of the holotype of *Calamotropha olarui* Nemeș, 1972. This species has been only described based on a single female specimen. Ever since the publication of the description of this species, neither Ioan Nemeș, nor any other author reported it from Romania or anywhere else, the type being the only known specimen related to this taxa. The species was omitted by several systematic lists and catalogues (Popescu-Gorj, 1984; Ganev *in* Karsholt & Razowski, 1996). In the Catalogue of the Lepidoptera from Romania (Rákosy, Goia & Kovács, 2003), *Calamotropha olarui* Nemeș, 1972 is mentioned as a valid species. Based only on the paper with the original description, the three authors assert that the drawing of the female genitalia submitted by Nemeș differs from other known species, without mentioning a particular one. They conclude that a confusion with an aberrant specimen of *Calamotropha aureliellus* (Fischer von Röslerstamm, 1841) seems to be excluded. Recalling Rákosy, Goia & Kovács' opinion (2003), Slamka (2008) considers that the female specimen used for the description of *Calamotropha olarui* Nemeș, 1972 may be (?!?) an abnormal specimen of *Calamotropha aureliellus* (Fischer von Röslerstamm, 1841). Hence, clarifying the real status of this species has become a pressing task.

Following the analysis of the type specimen and the slide with its genitalia, we have concluded that *Calamotropha olarui* Nemeș, 1972 is a junior synonym of *Nascia cilialis* (Hübner, 1796), a variable and widely distributed palaearctic species. This new synonymy brings a more consistent approach over a taxa with a controversial status within the family Crambidae.

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# Faunistic novelties for the Romanian ant fauna (Hymenoptera: Formicidae)

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**Key words:** ants, new records, *Tetramorium* cf. *caespitum*, hypogeic ant fauna, Romania.

The ant fauna of Romania is represented by 109 species. However, the number is still low, considering the geographical position of Romania and due to the fact that neighbouring countries have significantly more ant species. In this frame, we investigated myrmecological material from different regions of Romania.

We collected ants by pitfall trapping and hand collecting in 2012. Interesting results are given herein. *Proceratium melinum* (Roger, 1860) was sampled with pitfall traps in an anthropogenic habitat near Mlaştinile Satchinez (Banat region). We collected one worker and one queen. The site represents merely the second record of the species after almost one century. *Temnothorax parvulus* (Schenck, 1850) is mentioned for the first time from Dobrogea, being collected from deciduous forests near Dealul Niculițelului. The species was previously reported from only two sites. It prefers thermophilic habitats.

The last faunistic novelty is represented by one of the species from the *Tetramorium* cf. *caespitum* group. The species within the group (B, C, D and E) can be distinguished using morphometrics. Currently only *Tetramorium* sp. E is known to occur in Romania. However, we collected individuals of *Tetramorium* sp. C (*sensu* Schlick-Steiner et al., 2006) from Dobrogea, this being the first record for the ant fauna of Romania.

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# Chalcidoids (Hymenoptera: Chalcidoidea) from Văcăreşti Valley (Bucharest, Romania)

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**Key words:** Hymenoptera, Chalcidoidea, biodiversity, trophic relations, Văcăreşti Valley, Bucureşti.

Văcăreşti Valley from Bucharest is an area full of history. On the hill of the valley there was Văcăreşti Monastery which was demolished in 1986, the area was to be turned into a large artificial lake. The project was not carried to completion due to historical changes, the area remaining in a state of "frozen in the project". Nature has benefited from this situation, many species of plants and animals find here a large refuge, some of them being rare species, even with protection status. We propose to make here the largest urban natural park in Romania that aims to combine the scientific research with teaching, educational, even touristic and relaxation possibilities (Popescu, 2012; Lascu et al., 2012). The research of the flora and fauna of this particular area it's just at the beginning (Cojocaru & Popescu, 2004; Popescu, 2012) but there are enough elements that indicate the necessity of the protection of this special zone inside of the Bucureşti metropolis.

From Chalcidoidea (Hymenoptera), anterior of this research, species of Torymidae and Eurytomidae families belonging to *Tetramesa*, *Eurytoma*, *Bruchophagus*, *Systole*, *Sycophila*, *Idiomacromerus*, *Microdontomerus*, *Torymoides*, *Eridontomerus* and *Torymus* genera were mentioned, associated with plant species of *Calamagrostis*, *Festuca*, *Agropyron*, *Astragalus*, *Lotus*, *Trifolium* and *Medicago* (Popescu, 2009). Now, we present species of Chalcididae, Torymidae, Eurytomidae, Pteromalidae, Ormyridae and Eupelmidae. The entomological material was collected in period 2002-2013 by sweeping using an entomological net in all period of vegetation.

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# A new species of herb gall wasp (Hymenoptera: Cynipidae: Aylacini), from southeastern Romania (Dobrudja Province) inducing galls on *Papaver* sp. (Papaveraceae)

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**Key words:** Cynipidae, Aylacini, *Iraella*, new species, *Papaver*, Romania.

Aylacini (Hymenoptera: Cynipidae) is a paraphyletic tribe (Liljeblad & Ronquist, 1998; Nylander, 2004; Nylander et al., 2004) characterized to induce gall on herbaceous plants predominantly of the family Asteraceae. More than 120 species are known in the Holarctic region but the most part are present in the Palaearctic region (Melika, 2006). The western European genera where revised by Nieves-Aldrey (1994).

In poppies host (*Papaver* spp., Papaveraceae) three genera and five species of Aylacini are associated: *Barbotinia oraniensis* (Barbotin) and *Aylax minor* Hartig (on capsules of *P. rhoeas* L., *P. dubium* L., *P. hybridum* L. and *P. argemone* L.), *Aylax papaveris* (Perris) (on capsules of *P. rhoeas*, *P. dubium*, *P. argemone* L. and *P. somniferum* L.), *Iraella hispanica* Nieves-Aldrey (on flower buds of *P. rhoeas* and *P. dubium*) and *Iraella luteipes* (Thomson) (on stems of *P. somniferum*, *P. pseudorientale* and *P. bracteatum*).

The new species here described belongs to *Iraella* genus. This found unilocular (sometimes bi- or trilocular) galls in basis of stems of *P. rhoeas* L. rarely *P. dubium* L. The most important characteristics to differentiate adults and galls are discussed and illustrated. A key including all Aylacini inducing galls in poppers is presented.

Concerning to parasitoids of poppies gall, around 20 species has been mentioned (Askew et al., 2006) but only three are known from Romania (Andriescu, 1971, 1983). The parasitoids obtained from the gall wasps of this new species of *Iraella* are: *Parnips nigripes* Ronquist & Nieves-Aldrey (Figitidae: Parnipinae); *Eupelmus atropurpureus* and *Eupelmus vesicularis* (Eupelmidae); *Eurytoma robusta* (Eurytomidae); *Mesopolobus* sp. and *Trichomalus tenellus* (Pteromalidae); and *Idiomacromerus mayri* (Torymidae) contrast with *Iraella hispanica* Nieves-Aldrey where no chalcidoids have never been obtained. All material included in this study was collected along 2000-2012 years from some localities situated in Southeast of Romania, in Dobrudja Province, including the Black Sea coast.

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# The archaeogenetic analysis of Neolithic swine remains in the Romanian territory

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**Key words:** archaeogenetic, swine, Neolithic, Romania.

According to the studies carried out so far, the first domestic European pigs come from the Near-East, from where they were introduced into Europe starting with the 6th millennium BC. Previous archaeogenetic analysis on Romanian ancient samples of *Sus scrofa* dating from the Early Neolithic, until the Chalcolithic, revealed only one genetic signature for the domestic pig: the ANC-Y1-6A Near-Eastern haplotype and other studies also showed that this genetic signature was later replaced with a European one, during the Chalcolithic.

To further investigate when and how the turnover took place, another 104 samples from 14 different sites were analysed in this study, covering a wider period of time, from the 6000 BC to 3500 BC. All the samples were subjected to DNA extraction, PCR and sequencing. The results revealed the same Near-Eastern haplotype for the domestic pigs in the Early Neolithic, and only later, starting with the Late Neolithic, when the farming develops and the number of domestic pigs rises, they also present a higher variety of haplotypes. The variability of genetic signature in the Chalcolithic sustains the already discussed introgression of the European wild boar in the domestic stock of Near-Eastern origin and also raises question marks about the trade directions and farming development in the Neolithic on Romanian territory.

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# The effect of cadmium chloride on caudal fin regeneration in *Corydoras aeneus* and *Carassius auratus gibelio*

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**Key words:** cadmium chloride, caudal fin, PCNA, regeneration.

Cadmium is a highly toxic heavy metal. Pollution of the fresh water environment with cadmium is a global concern because of toxicity, persistence and accumulation over time by the marine organisms of the metal. On the other hand, it is well known that fish can regenerate their caudal fin after amputation or injury, therefore in the present study we investigated, structurally, the effect of cadmium chloride on caudal fin regeneration for two different sized fish species like *Corydoras aeneus*, albino form (4-5 cm length) and *Carassius auratus gibelio* (12-15 cm length), that have not undergone such studies.

The effect of cadmium on caudal fin regeneration was analyzed by treating of fish with 10 mg/L cadmium chloride ($CdCl_2$ X $2H_2O$) after fins amputation. This concentration was maintained constant throughout the experiment. Fins regeneration for the control and treated group was evaluated at 3, 6, 9 days post amputation (dpa) for *Corydoras aeneus* and at 4, 8, 14 dpa for *Carassius auratus gibelio*. Regenerative outgrowth length measurement, histological and immunohistochemical studies by PCNA (Proliferating Cell Nuclear Antigen) labeled, for cell proliferation detection, were performed.

In the present study 10 mg/L $CdCl_2$ was not lethal for the two fish species. Comparison of control and cadmium treated fish has shown that regeneration of caudal fins was delayed after cadmium treatment. Thus, the lengths of regenerative outgrowths in $CdCl_2$ treated fish were lower than those of the controls. Histological analyses revealed alterations in epidermal regeneration and blastema formation of treated fish. PCNA staining indicated a significant reduction of cell proliferation in regenerated caudal fins of cadmium intoxicated fish.

We report here for the first time that caudal fin regeneration in *Corydoras aeneus* and *Carassius auratus gibelio* is delayed by cadmium chloride exposure. *Corydoras aeneus* was more sensitive to cadmium chloride exposure than *Carassius auratus gibelio.*

# Inventory and distribution of cichlids (Pisces: Perciformes) in Morocco

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**Key words:** cichlid fish, inventory, distribution, Morocco.

Cichlids (Pisces: Perciformes) are tropical fish that have left relict populations in the Sahara and as such, they have a great national value for the North African countries, except Egypt in which those fish populations are tightly connected to tropical areas of the Nile River.

In Morocco, the cichlids were known, until recently, by two species, *Sarotherodon galilaeus* and *Tilapia zillii*, both reported respectively for the left and right banks of the Middle Dr'a. Often, the distribution of these two species has been extended throughout the middle and lower course of this river by extrapolation.

Examination of collections kept at the Natural History National Museum of the Scientific Institute of Rabat, as well as samples recently carried out in different areas of the pre-Saharan and Saharan Morocco have allowed to update the inventory of Cichlids Morocco and to reshape the distribution of different species.

Thus, *Sarotherodon galilaeus* and *Tilapia zillii* also populate the downstream areas of the Dr'a River, in addition, the distribution of *Tilapia zillii* is not limited to this basin because samples assigned to the latter species were captured in other Moroccan or Moroccan-Algerian watersheds.

The capture of specimens of *Hemichromis bimaculatus* in the Algerian part of the Rhir River catchment suggests that the fish may occur few kilometers upstream in the Moroccan side of the river.

In addition, a survey conducted in January 2009 at Sebkhet Imlily (an original ecosystem located in the extreme south of Morocco) has revealed for the first time in North Africa and the Sahara the occurrence of another cichlid, *Tilapia guineensis* whose northern limit of its distribution was, so far, known as the Senegal River. This species was found in September 2012 in a new station (the gueltas of Oued Aabar) nearly 700 km north of the first station.

Thus, the cichlids are represented in Morocco by at least three species (*Sarotherodon galilaeus*, *Tilapia zillii* and *T. guineensis*) while confirmation of the presence of *Hemichromis bimaculatus* in the Moroccan side of Rhir River in Southeast of the country is pending.

# First data on the presence of bats (Mammalia: Chiroptera) in the Cansiglio Forest (Venetian Pre-Alps, N. E. Italy)

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**Key words:** Chiroptera, Cansiglio, Veneto, *Rhinolophus hipposideros*, *Myotis myotis, Tadarida teniotis,* N. E. Italy.

The Cansiglio Upland is an interesting natural area placed in Carnic Prealps (Prealpi carniche), between the provinces of Treviso, Belluno and Pordenone. It is part of the mountain group of the "Monte Cavallo" mountain. With its high peaks it juts out toward the Venetian plane. Most of this territory is placed in the region Veneto (provinces of Treviso and Belluno), a portion is in the region Friuli-Venezia Giulia (province of Pordenone). Main altitude of the Cansiglio Upland is 900-1300 m a.s.l.; it is an area of limestone rocks, with presence of vertical caves, one cave (Bus de la Genziana) reaches depth of –580 m. Much of the area of this upland is covered by a great forest, the Cansiglio Forest. This forested area was protected by the Republic of Venice for centuries, to have good woods to build boats and for the poles for fondations of Venice. Actually the Forest covers about 8000 hectares. It's not a natural park, but it is a protected area, controlled and managed by national forest service. This important forest was never investigated before for presence of Bats (Mammalia: Chiroptera). Previous information on bat presence in the area was limited to records of *Rhinolophus hipposideros*, for the cave "Bus de la Genziana". In the last 10 years a series of bat detector monitoring during summer months, and some interesting bone remains from some important caves of the area, permit us to give a first list of the bats of the area, with some interesting observation on bat presence and distribution. During the monitoring activities with bat-detectors, presence of bats was checked in different habitats: near cave entrances; in forest; in open pastures; under street lamps (outside buildings, and along the main streets of the upland). Bat bones collected in caves of the Cansiglio Forest provided materials referred to these species: *Rhinolophus hipposideros*, *Myotis myotis*. Near cave entrances were recorded: *Rhinolophus hipposideros*, *Myotis* sp. In the forest *Pipistrellus pipistrellus* (the most common species)*, Eptesicus serotinus* and *Myotis* sp. were recorded. Along the main streets, bat species recorded in hunting flights under street lamps were: *Pipistrellus pipistrellus, Pipistrellus kuhlii* (few records, only in the lower part of the upland), *Eptesicus serotinus*. In open pastures *Rhinolophus hipposideros, Rhinolophus ferrumequinum* (few records), *Pipistrellus pipistrellus* and *Tadarida teniotis* were recorded. The records of *Tadarida teniotis* (summer 2011-2013) are the first records of this species in the province of Treviso, and represent the easternmost records of this species in Veneto region. The area of the Cansiglio Forest offers many habitats with rocks and crevices, typical roosts

of this elusive bat species. For the Cansiglio Forest area, on the base of bone materials and skulls collected in caves, monitoring with bat detectors in different habitats, these bat species were recorded: *Rhinolophus ferrumequinum* (Schreber, 1774), *Rhinolophus hipposideros* (Bechstein, 1800), *Myotis myotis* (Borkhausen, 1797), *Pipistrellus kuhlii* (Kuhl, 1817), *Pipistrellus pipistrellus* (Schreber, 1774), *Eptesicus serotinus* (Schreber, 1774), *Tadarida teniotis* (Rafinesque, 1814).

# Further range expansion and ecology of a winning strategy of *Pipistrellus kuhlii* (Kuhl, 1817), a vespertilionid bat in expansion in Europe

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**Key words:** bats, Bat Ecology, Europe, *Pipistrellus kuhlii*, Global Warming.

Bats are generally considered as endangered species; many species has declined in W-Europe in last decades, and only few species are considered as not-threatened. Very few species are considered increasing in number in recent years.

In Europe, in the 80ies a vespertilionid bat, *Myotis daubentonii*, was considered a growing species in N. and Central Europe (on the basis of many new records and observations of increased number in monitored roosts; Stebbings, 1988). In 1993 Vernier published a paper observing that another species of vespertilionid bat, the Kuhl's pipistrelle - *Pipistrellus kuhlii* (Kuhl, 1817), one of the most common bats in Italy and in Mediterranean area, was clearly increasing in number and might be considered as a growing species, with many new records collected with different methods (especially bat-detector monitoring and observation of roosts in new buildings). *Pipistrellus kuhlii* was observed to use several unusual roosts (as concrete poles of electric lines or plastic boxes of wiring; Vernier, 1995).

*Pipistrellus kuhlii* presents a very large distribution that covers Europe, Asia and Africa: it is abundant in lowlands and deserts of the Mediterranean region, Arabian, Iran and Transcaucasia. In mountains these bats were found up to 1,500–1,800 m a.s.l., in the zone of mountain steppe, but in Europe they usually don't live over 1,000 m a.s.l.

This species was noted to expand toward North, sometimes using trains, buses, tracks and boats (in Nederland and in United Kingdom; Sachanowicz et al., 2006). The areal expansion of *Pipistrellus kuhlii* was also recorded in several Est European Countries; in recent years this little amazing bat was recorded for the first time in Poland, Germany, Serbia, Ucraine, Slovakia, Czech Republic (Wawrocka et al., 2012). Some of this new findings may be referred to a line of expansion coming from East-population of the species, as revealed by morphological characters of collected/recorded specimens (coloration of dorsal fur, f.e.).

Several factors may have contributed to the impressive expansion of *Pipistrellus kuhlii*. It is a typical synantropic bat. Two main factors for survival of bats are roosts and foraging areas. This bat species tends to occupy in brief time new buildings and a series of man-made objects as roosts, so many new settlements, built for humans, may provide a lot of roosts for these adaptable

bats. For this bat species foraging areas are parks, streets in urban areas, but also agroecosystems or natural habitats.

Hunting under street lamps (a typical behaviour of *Pipistrellus kuhlii*) may reduce the energy expenditure to search and locate preys; these bats emerge very early and are active for feeding (with different hunting phases) for all the night, up to dawn. Usually all females give birth to two cubs, and reach sexual maturity in the first year.

In the Mediterranean area, the activity during the year is very long. *Pipistrellus kuhlii* presents a very light hibernation, and observations done in winter in Po River plain (N. E. Italy) revealed activity flights even in December and January (therefore the activity stopped for few weeks in all the year).

Two main lines of expansion of *Pipistrellus kuhlii* may be recognized; one from Southern Europe, toward N-NW, and another from the East, toward East-Central Europe.

In Italy the species is very common, and many colonies were found across the years (usually groups of 10-30; up to 400 individuals) in houses and buildings, old and new. *Pipistrellus kuhlii* is the most common and the most numerous species in many investigated sites, from the sea level up to 1000 m a.s.l. Finally, the global warming may be an important factor for the areal expansion of *P.kuhlii,* a termophilous species*,* in Europe.

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# Chiroptera fauna from Meghalaya - results of the expedition Caving in the Abode of the Clouds Project (2011-2012 Jaintia Hills), India

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**Key words:** bats, winter survey, expedition, India.

Between 2011-2012, a research study concerning the bats from Meghalaya and Assam states, in India, was initiated. It was focused especially on the Kseh area from Jaintia Hills, but Khasi Hills (Meghalaya) and Kachar Hills (Assam) were also considered. The main objective was the survey of the winter bat' colonies from the caves discovered during the expedition "Caving in the Abode of the Clouds" (Arbenz, 2012).

Over the two yearly expeditions, 10 new caves were added on the list of the bats' subterranean habitats in Jaintia Hills and Kachar Hills. 18 species were recorded by using different catching methods: netting in front of the caves, harp trapping in the forest area and handling. It was discovered that two big caves are used by the *Hipposideros lankadiva* and *Hipposideros armiger* species, the colonies being estimated at over 10,000 specimens in Krem Labit Kseh Cave and at over 7,000 in Kerm Dieng Jem Cave. During the two winters, we observed the colonies dynamic inside the shelters, as well as the human influence: recent signs of hunting parties, illegal limestone and coal mining in the caves proximity.

To the list of 117 Indian bat species known (Talmale & Pradhan, 2009), three other new species were added, recorded for the first time in India: *Rhinolophus siamensis* – also known in the neighbouring countries, *Murina jaintiana* – for the first time described for science (Ruedi et al., 2012) and *Murina pluvialis* Ruedi, Biswas & Csorba, 2012, new to science as well, recorded in East Khasi Hills.

Besides, six other species were recorded for the first time in Jaintia Hills.

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# The importance of Calliphora, Sarcophaga and Coleoptera in forensic investigations in Lebanon

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**Key words:** Lebanon, forensic entomology, experiment.

Forensic Science is a very new science in Lebanon and Forensic entomology in particular is almost unknown and it is starting to emerge very slowly. The only Forensic entomologist in Lebanon is Dr. Danny Azar who, in 2004, has offered his expertise to help in the investigation of a homicide.

In order to extrapolate on the determination of PMI on humans, the presence of species of Calliphoridae and Sarcophagidae families and of the Coleoptera Order was monitored on a domestic pig carcass (*Sus scrofa domestica*). The carcass was placed for a period of 90 days between the months of June and September at an altitude of 1400 m above sea level in the mountains in Lebanon. Meteorological parameters were recorded during the entire experiment. The role of Calliphoridae was analyzed during the whole decomposition process. The variations and effects of the change of temperatures on the life cycle and maggot development of the Calliphoridae dominant species. Wave's succession and competition between certain families of Diptera and Coleoptera Orders were discussed.

We have identified new species of Coleoptera and Diptera. Those species have never been documented on the Lebanese territories prior to our experiment that is the first in Lebanon. This experiment is a first of a series of similar experiments that will be worked on pig carcasses that will be placed at different altitudes and different weather conditions in order to determine PMI based on the presence of Coleoptera and Diptera and to encourage the science of Forensic Entomology in Lebanon.

# Forensic entomology and microbiology – new experimental approach

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**Key words:** post-mortem interval, entomology, bacteria.

Forensic entomology, a modern approach for establishing the post-mortem interval in criminal investigations, is widely developed in many countries worldwide. In addition, forensic microbiology represents a fairly new field, with high potential for providing complementary information in criminal investigations.

Considering that forensic entomology and microbiology are not currently operating tools in all European countries, Romania belonging to this category, and that these methods are based on specific insect and microbial fauna for each bioregion, research on both these fields on Romanian territory is required and justified.

Our study focuses on determining the succession of necrophagous insect species and to identify the microbial diversity dynamics within animal carcasses, in correlation with the stages of carcase decomposition process.

As experimental model, we used pigs carcasses exposed outdoors, in an urban natural environment not accessible to vertebrate scavengers. The bacterial community composition from both oral and anal cavities and the insect dynamic succession were monitored for 27 weeks during the cold period and beginning of warm period (November 2012-May 2013). Tissue samples were weekly harvested from internal (4-8 cm deep) and external section of pigs' colon and mouth cavities. The necrophagous insect species were taxonomically identified and total bacteria genomic DNA was extracted from each sample. Bacterial 16S-rRNA gene fragments were amplified by PCR, and their molecular diversity was analyzed by denaturant gradient gel electrophoresis (DGGE). In addition, all meteorological parameters were continuously recorded.

Under these conditions, necrophagous insect species were present and collected in all stages of development within the interval of 17 and 27 weeks after exposure. These species belonged to four families of Diptera and five families of Coleoptera Orders, respectively. The diversity and activity of necrophagous insect species was reduced during the cold period, and increased with the temperature raise during April-May, with the earliest and dominant appearance of *Calliphora vomitoria* and *Calliphora vicina* species. The time-course of necrophagous insect species appearance was correlated with meteorological parameters and carcase decomposition stages.

The bacterial 16S-rDNA DGGE community profile indicated a higher number of strains and species in the mouth cavity than in the colon cavity. New bacterial species appeared in the mouth cavity after approximately six weeks of exposure, while in the colon cavity only after ten weeks.

Changes of bacterial species and dynamics were dependent on the stages of decomposition process. Both insect and bacterial community dynamics were correlated with the meteorological conditions (temperature and humidity).

The combined information obtained from this taxonomy and molecular study on necrophagous insects' and bacterial communities' dynamics represents primary local data that can be used in national forensic expertise for accurately determining the post-mortem interval.

# Biodiversity of forensically important flies in Fars province of Iran

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**Key words:** biodiversity, forensic entomology, Diptera, Iran.

In addition to their high biodiversity, Diptera has an important role in forensic science. The aims of this study were to study the biodiversity of forensically important flies in Fars province from 2011 to 2012.

Fars province, situated in southern part of Iran, has been selected for this study because of its three distinct geographical regions which can provide good data on their effects on fly biodiversity. Sampling methods were monthly collecting of free flies by means of two kinds of adult traps.

A sum of 15865 adult flies of 28 species were collected which belonged to Calliphoridae (3736 samples), Sarcophagidae (1518 samples), Muscidae (9928 samples) and Fanniidae (683 samples). Three of collected species in this study including *Sarophaga dux* (Sarcophagidae)*, Muscina prolapsa,* and *Hyrotaea capensis* (Muscidae) were the first report for fly fauna of Iran. Collected species included: 13 species from Sarcophagidae, 6 species from Calliphoridae, 7 species from Muscidae and 2 species from Fanniidae. The Except of Simpson's index (D) (*P* value=0. 05), other indices (Margalef, Simpson (D), Shanon-Wienner and Evenness) didn't show significant differences between three geographical regions (*P* value>0. 05).

The most important factor in uniformity of biodiversity indices in various geographical regions of Fars province is nomadic behavior with regular movement of sheep and goat across the province. The results of this study are useful for forensic entomology database in Iran which is very low.

# Illustrated keys for forensically important adult flies of Iran

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**Key words:** illustrated keys, forensic entomology, Diptera, Iran.

Diptera has an important role in forensic science, especially in estimation of post mortem interval. The first step is exact the identification of the collected flies. There is not literature on fly fauna and their identification in Iran. The aim of this study was to prepare applicable key for identifications of forensically important flies of Iran.

Collected flies in a biodiversity study on forensically important flies of Iran were used in this study. The flies were collected from Fars province, south of Iran, during 2011 – 2012. Various keys from literature such as books, papers, workshop and congress proceedings as well as online documents have been used to provide the keys.

The keys provided the identification of 32 forensically important flies including 13 species from Sarcophagidae, 6 species from Calliphoridae, 7 species from Muscidae and 2 species from Fanniidae families.

Various characters used for providing the key such as antennal segments, shape of arista, number and shape of wing veins, presence or absence of hairs on various parts of thoracic segments, presence or absence of hairs, spines and spurs on feet, and color patterns of abdominal segments are used commonly for the keys of most families. The important character for identification of Sarcophagidae is the shape of various segments of male genital organ. Identification of female Sarcophagidae with the provided key is impossible.

There aren't international applicable keys for flies. Fly identification keys are provided locally in the world; their use in other countries might be misleading. These local keys which will help medical entomologists and forensic entomology specialists to work on flies and enhance the fly data base of Iran.

# An example of international cooperation regarding forensic entomology between three countries – Romania, Iran and Italy

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**Key words:** necrophagous insect species, post-mortem interval, international experiment.

Forensic entomology is used as a truthful tool in post-mortem interval identification in many countries. Following this fact, we considered that an international cooperation with the involvement of countries from various global zoogeographical regions will help at the substantiation of this science and corresponding method in countries that do not use entomology expertise in forensic investigations, so far.

Although it is very difficult and complex to organise such an experimental design, we have achieved this, following that, in the future, to establish a larger scale experiment in which we will involve more countries on longer term.

The main objective of this experiment was to identify the necrophagous insect species of Diptera Order using bottle traps and pitfalls along one week, in Romania, Italy and Iran, placed in various parts of Palaearctic zoogeographical region, in August 2013. The synchronized mounting of the traps and the registration of meteorological parameters were taken into account. The distance between Bucharest and Tehran is about 3080 km, between Bucharest and Modena 1204 km, and between Tehran and Modena 4356 km. Also it was taken into consideration the climate of these respective countries, starting with Romania's capital city that has a specific temperate continental climate, then Tehran with semi-arid continental climate and Modena with a temperate climate.

Necrophagous insect species belonging to Calliphoridae and Sarcophagidae families were taxonomically identified and several accidental species.

This experimental model did not mean to be an exhaustive one, still the idea that formed the foundation was developed from the desire to demonstrate that international cooperation is a key factor in forensic entomology research and to emphasize the importance of using this method by the police authorities for post-mortem interval identification.

In the future, in order to form a database which should include detailed information resulted from a forensic entomology expertise, the participation of many entomologist experts from different countries is a sine qua non condition.

# New findings from Carboniferous and Permian strata of Polish part of the Sudety Mountains

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**Key words:** Permo-Carboniferous, ichthyofauna, actinopterygians, acanthodians, Intra-Sudetic Basin.

Across Europe, there are several outcrops of Permo-Carboniferous sediments with an extensive research history and abundant findings (e.g. in Spain, France, Germany, Czech Republic). In these sites, fishes are most common among vertebrates. Faunal connections between those areas have been the subject of many studies. The regions where extensive continental Permo-Carboniferous strata are exposed within the Sudety Mountains range, they are spread on a large area in north-western Czech Republic, south-eastern Germany and south-western Poland. Since the 19th century fossiliferous localities have been described from this area but mainly from Germany and the Czech Republic. There are only a few papers on the Polish localities.

We present new fossils collected from six localities (Intra-Sudetic and North-Sudetic sedimentary basins). Vertebrate remains are dominated by disarticulated fishes, mainly actinopterygians. There are five genera (representing three actinopterygian families) recognized in the material. One of special importance is *Sphaerolepis* sp., represented by unique thin, rounded scales. The presence of this taxon at Okrzeszyn site suggests a Stephanian age. Remains of three other actinopterygians different from those mentioned above are still unidentified. There are two morphotypes of xenacanthiid teeth (one identified as *Triodus* sp.). Both types of teeth come from the same strata in the North-Sudetic Basin. Numerous isolated bones, scales and fin spines of *Acanthodes* cf. *gracilis* were also found in several localities both in the North-Sudetic and the Intra-Sudetic Basins. We found only one articulated fragment (part of the axial skeleton) of an amphibian (possibly a branchiosauriid). The vertebrate fossils are usually accompanied by bivalves (*Palaeodonta* sp.), several different plant remains, coprolites and trace fossils.

The identified ichthyofauna from south-western Poland shows a mixed composition of both the Czech part of Intra-Sudetic Basin and the distantly located Boskovice Graben (Czech Republic). The recently discovered material gives opportunity for extended research on diverse end-Paleozoic ichthyofauna.

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# New localities of the mammoth fauna in the basin of the Kolyma River (Northeastern Russia)

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**Key words:** mammoth, mammoth fauna, animal carcasses, the Kolyma River.

In the basin of the Kolyma River the Russian North-East, reconnoitring expedition was held in July-August 2013. As a result of this expedition, the new locations of the mammoth fauna have been found. Despite the fact that the region is poorly researched by palaeontologists, the basin of this river is famous for unique discoveries: animal carcasses of an adult male *M. primigenius* from the Berezovka River (a tributary in the middle reaches the Kolyma River), found in 1901 (Zalensky et al., 1903) with partially preserved soft tissues; frozen incomplete carcass *C. aniquitatis* (Boeskorov et al., 2009) with soft tissue, found in 2007.

Locations and definable remains:

**Verkhnekolimsky district:** 1. The Omulevka River,: *Mammuthus primigenius*; *Bison* sp.; *Alces* sp.; 2. The Pravokolymskaya creek: *Mammuthus primigenius*; *Coelodonta antiquitatis*; *Bison* sp.; *Equus* sp.; 3. The Irileah Siene River: *M. trogontherii* (mandibulae c m2 dex); *Mammuthus intermedius* (=*M. chosaricus*); *M. pimigenius fraasi* (=an early form of mammoth); *Mammuthus primigenius primigenius* (=a later form of mammoth); *Mammuthus* sp.; *Equus* sp.; *Cervus elaphus*; *Ovibos* sp.; *Bison* sp.; *Rangifer tarandus*; *Coelodonta aniquitatis*;

**Srednekolimsky district:** 4. The Berezovka River: *M. Primigenius.* Excavations of new finds of an adult mammoth is planned to carry out at the end of 2013;

**Magadan district:** 5. The Korkodon River: *Bison* sp.; *Equus* sp.; *Rangifer tarandus*.

We have managed to find the most numerous carcasses in the location with the mammoth remains of the various geological ages - Irileah siene. Among them we should note: (a) the tusk with abnormal painful growths like those found in the vicinity of Toybohoy village, on the Kotelnyi and Bolshoi Lyakhovskiy Islands (Vereschagin, 1971; Vereschagin, Tikhonov, 1986), it is the third found relic of this type known to the scientific world; b) fragment of the cut tusk in ancient times suggests that there is a Palaeolithic site. A new mammoth skeleton with partially preserved soft tissues (sole and others) found near the Berezovka River is of extreme importance.

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# Was *Myotis alcathoe* present in the Holocene bat fauna from the Tatra Mountains?

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**Key words:** *Myotis alcathoe*, cranial morphometrics, the Holocene.

The investigated osteological material came from 12 thanatocoenoses in the Polish Tatra Mountains, dated with the $^{14}C$ AMS method. Multivariate morphometric analysis of 21 cranial and dental characters was applied to a sample of subfossil and recent specimens of "*Mystacinus* group" species.

Many bat species are hard to identify by cranial morphology. Close similarity exists between each of investigated species or morphological subspecies, as well as between their recent populations and populations from subfossil collection. Principal component analysis (PCA) was used to verify the correctness of taxonomic identification of specimens and generally to distinguish between the Holocene populations of each species.

No quantitative cranial characters until nowadays were known as being distinguishing features for species from "*Mystacinus* group". Qualitative dental characters are better described and used as diagnostic in differentiation for example *M. brandtii* and *M. mystacinus*.

*Myotis alcathoe* was described as new for Polish bat fauna in 2001. From that time many records of its presence in the territory of Southern Poland have appeared. Preliminary results of morphological analyses suggest the possibility of *M. alcathoe* existence in investigated area already in the Middle and Late Holocene.

Although the contemporary methods in palaeobiological researches or cranial characters themselves can be insufficient in discrimination "*Mystacinus* group" species, further morphological studies are worth of continuation. The bat skull has a complicated anatomical structure, which is the key not only to much of taxonomic research, but also to research on the ecology of bats, their evolution and functional morphology.

# Structural characteristics of invertebrate populations from areas polluted with heavy metals (Zlatna, Romania)

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**Key words:** heavy metals pollution, Zlatna, flotation ponds, epigeic invertebrates, ecological succession.

This study is focused on the structure of the epigeic invertebrates inhabiting technogenic areas (three flotation ponds) and natural areas (meadows) from Ampoiuli and Geoagiului Basins. In the Ampoiului Bazin we studied two flotation ponds (Iazul Mare and Iazul Mic), situated to small distance and being similar as composition and physical-chemical characteristics of substrata and the same origins – residuals from the ore processing. The same characteristics have the Hanes flotation pond (from Geoagiului Basin). The natural meadow (considered reference area) is in the neighboring of Iazul Mare area.

The invertebrates were collected in 2008 using pitfall traps method. Qualitative and quantitative aspects were analyzed to establish the structural characteristics of invertebrate communities of these areas. The common characteristics for the three technogenic areas are lower densities of invertebrates in comparison with the reference area, similar taxonomical composition, high proportion of recedent and accidental groups of invertebrates. The differences are given by the variation of phytophagous groups according to the characteristics of vegetation and further, the predator status in the local coenoses (e.g. Araneae and predator species of Carabidae) according to the correlation degree with their prey and the ecological significance of these issues.

In comparison with the invertebrates communities from Moldova Nouă flotation ponds (technogenic areas with the studied ones but ecologically restored), all these features are specific to ecological structures subjected to human impact or being emphasized in early successional stages.

# Between flood and drought: adaptive responses of mollusc communities to a highly fluctuant complex of habitats, in one of the last lower Danube River flood areas (The Small Wetland of Brăila Nature Park, Romania)

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**Key words:** gastropods, bivalves, community dynamics, seasonal changes, adaptive strategies, human impact.

Along the lower Danube River course, The Small Wetland of Brăila Nature Park is a last remnant part of the former rivers cape's flood area. High dykes bordering both riverbanks of the Danube cause seasonal, extreme, waterlevel fluctuations, forcing a chain of changes in the islands' habitats and their communities. During the spring the floods cover almost all of the islands, forming a continuous water surface between the two dykes. Only the emergent forests mark the position of the former land. On the other hand, by the end of the summer the main part of the islands is dry land, except for shallow water remnant parts of some lakes and canals.

Between these extreme habitat fluctuations, the mollusc communities have adapted in several ways. During the rainy season, an extreme r-selection is obvious within the islands' waters: huge numbers of offspring, which mostly will not survive during the warm and dry season, followed by an increasing survival curve the rest of the year. Some few tolerant species will survive in the remnant shallow, warm, stagnant waters, with little dissolved oxygen. Only the rheophylic, psamophylic species characteristic for the Danube River and its branches will be less affected. They adapting to the changing waterlevels by active vertical migration. Both vertical as well as horizontal migrations also enable the survival of some terrestrial and aquatic species on the islands. For instance, when the waterlevel is raising, in the forested areas the terrestrial snails climb on the tree stems and resist here until the waterlevel lowers. There is a continuous switch between aquatic and terrestrial habitats, and the molluscs are gradually changing their behaviour and communties structure accordingly. The 45 certain present species are forming dynamic meta-communities in a broad sense. The presence of other 16 species is still uncertain (empty shells or references).

# Ground-living spiders in polluted sites of industrial enterprises of Ukrainian cities

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**Key words:** Araneae, air pollution, Ukraine.

Anthropogenic disturbance factors have important effects on spider populations (Clausen, 1986; Maelfait & Hendrickx, 1998; Fedoriak, 2008; Koponen, 2011). However, effectiveness of using spiders as bio-indicators of air pollution is still underexplored.

We conducted a comparison of the structure of ground-living spider assemblages at heavily polluted green sites on the territories of industrial enterprises and at slightly polluted green sites (public gardens, city parks) of Chernivtsi and Uzhgorod cities.

The species richness was lower on the industrial areas than in the areas of public gardens and city parks both of Chernivtsi and Uzhgorod. Differences were found in the species diversity of spiders at heavily and slightly polluted sites, the averages of Shannon-Wiener's diversity index being respectively 1.17 and 1.59 in Chernivtsi and 1.91 and 2.28 in Uzhgorod. Spider assemblages at industrial sites are characterized by a phenomenon of super dominance of one species (except of the territories of Bus-trolley Company and Factory Industria). *Pardosa lugubris* (Walckenaer, 1802) (Lycosidae) sensu strictu was the most abundant species dominating in 4 industrial enterprises areas sampled in Chernivtsi and in 1 in Uzhgorod. *Pachygnatha degeeri* Sundevall, 1830 (Tetragnathidae) dominated in the Chernivtsi Brick factory to a great extent (92.3 % of adults) and *Zodarion rubidium* Simon, 1914 (Zodariidae) dominated in the Uzhgorod Mashinebuilding Plant "Tysa".

The activity density of spiders was much higher at surveyed industrial enterprises compared to the areas of public gardens and city parks both of Chernivtsi and Uzhgorod.

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# Ecological investigations between soil mite communities and some environmental variables from urban ecosystems from Romania

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**Key words:** pollutant, park, gamasid, abundance.

Among soil invertebrates, mites are considered very sensitive to heavy metal contamination. They are rich in species and are abundant in soil, especially in the organic layer, where they contribute to litter decomposition (Rusell & Alberti 1998; Gwiazdowicz et al., 2011; Monroy et al., 2011). Therefore, any disturbances in their density and species composition under the influence of heavy metals affect the rate of soil organic-matter transformation and soil fertility (Filser et al., 2008; Haimi & Mätäsniemi, 2012). This is the reason that they are considered a precious boindicators for soil quality (Ruf, 1998; Koehler, 1999; Coja & Bruckner, 2006; Nahmami et al., 2006; Beaulieu & Weeks, 2007).

This research aims to establish the influence of some environmental variables (as heavy metals soil pollutants, type of habitat, soil pH and humidity) on edaphic mite communities, in urban parks from Bucharest: Cişmigiu, Unirea and Izvor. The study was carrying out in 2006-2007. 405 soil samples were collected with 14 species of gamasids. The common species for all parks were *Hypospis aculeifer*, a cosmopolite mite, and the small deep dwelling survivor *Rhodacarellus silesiacus*. Taking into account the measured concentrations of heavy metals from soil (Pb, Cu, Cd, Zn), the obtained values were increased over references values and limit of alert.

According to the multivariate analysis (CCA) the abundance of mite species was significantly related to parks, humidity, pH, Cd and Cu concentration. Humidity and pH were significantly correlated with mite species abundance, the correlation being positive for humidity and negative for pH. This analysis indicated a significant negative effect of Cd concentration and a significant positive effect of Cu concentration on mite species abundance. This population parameter varied significantly among parks with the highest value in Unirea and the lowest in Cişmigiu.

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# Influence of insect defoliators on oak forests in the Republic of Moldova

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**Key words:** *Quercus* spp. defoliators, Tortricidae, Geometridae, Noctuidae, Republic of Moldova.

Climatic conditions of the last five years (2009-2013) have been very favourable for the development and distribution of the main defoliating insect species, which greatly influenced the deterioration of trees. Weakened trees are invaded and killed by insects and those diseases that cannot successfully attack healthy trees. Usually the progression of decline is slow, occurring over several years.

The main aim of this paper is to investigate the structure of lepidopterous communities on oak trees (*Quercus* spp.) in the Republic of Moldova and to determine the most important pests of these wood species. The researches on oak defoliators were made in the period 2009-2013 in the oak woods of the Republic of Moldova.

According to the results of forest pathological surveillance, the numerical growth of phytophagous insects is remarkable: increased population densities and rapid expansion of distribution centres. The area of defoliating pest outbreaks on *Quercus* spp. amounted in 2009 to 3.1 thousand hectares, and rose in 2013 to 81.99 thousand hectares, about 22.6% from the woods managed by "Moldsilva" Agency.

In the last years, a remarkable pretty quick change of dominant species in the pest complex took place. The tortrix moths are dominant on owlet moth and geometer moth. In the complex of leafrollers, the *Aleimma loeflingiana* moth is the dominant species (60-90%). Also, in the central and southern areas of the country, there is an especially pronounced population growing of green oak leaf *Tortrix viridana*.

# Coprophilous beetles (Coleoptera) associated with feces of brown bear (*Ursus arctos* Linnaeus, 1758) in the Carpathians

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**Key words:** coprophylous Coleoptera, species associations, *Ursus arctos,* Carpathians.

Previous studies on the fauna of beetles associated with scats of brown bear (Mysterud & Wiger, 1976; Martin-Piera & Lobo, 1996; Carpaneto et al., 2005) revealed that the number of species of Scarabaeidae decreases from the excrements of omnivorous mammals to those of carnivores.

Because dung beetles (Scarabaeidae) have a digestive system adapted to digest the cellulose, they are present in a large number of species into the dung of herbivorous mammals, rich in cellulose. But, excepting a few generalist species, dung beetles avoid the feces of omnivorous and especially of the carnivorous mammals.

According to Carpeneto et Fabbri (1984), among omnivorous mammals, only the brown bear houses a rich community of these insects, but no characteristic species or associations of species characteristic of bear feces could be identified.

The hypothesis that we proposed to test was whether other species of beetles, with a mixed diet (necrophagous/coprophagous), which belong to other families, less specialized than the Scarabaeidae in dung decomposition, may form representative or characteristic associations for the bear droppings.

Our preliminary studies carried out in 2012 on 29 samples of brown bear feces sampled in 12 sites in the Carpathians, have enabled us to identify 44 species of beetles belonging to five families: Staphylinidae (25), Hydrophilidae (4), Geotrupidae (2), Scarabeidae (13) and Histeridae (1).

Preliminary statistical analysis (three association indices between pairs of species for which $\chi 2$ test indicates a positive association, and cluster analysis), strongly suggest that between 15 species of coprophilous beetles (other than Scarabeidae) there is a significant positive association in the brown bear feces. Among the species indentified by us, *Tachinus laticollis, Tachinus pallipes, Bisnius puella, Cercyon lateralis, Megarthrus depressus* have been indentified also in the scats of brown bear from South Norway (Mysterud & Wiger, 1976).

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# Histological changes induced by Cocamidopropyl betaine acute intoxication in *Cyprinus carpio* (Actinopterygii: Cyprinidae)

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**Key words:** cocamidopropyl betaine, acute intoxication**,** histopathology, *Cyprinus carpio*.

Cocamidopropyl betaine (CAPB) is an amphoteric surfactant used in cosmetics, toxic to fish, crustaceans and algae at concentrations of 1-10 mg/l. Whereas the Romanian and international laws do not provide limits for these compounds, the study aims to analyze the structural changes induced in carp by acute exposure to 1mg/l CAPB. After 24h, 48h and 96 h, tissue fragments were taken, processed and stained with Hematoxylin-Eosin.

Long-term toxic effects manifested differently in the fish organs affected by the oxidative stress state. After a 48 and 96 hours exposure, hepatocytes rupture and picnosis, macrophage aggregates and dilated sinusoids occurred, being associated with the functional damage of the liver.

24 hours after intoxication, absorptive cystic vacuoles of the epithelium, damaged epithelium in the apical area of the villi and changes of the nuclei size had been noticed in the intestine. The villi fusion, the widening of the central stroma and a slight increase in *lamina propria* lymphocytes appeared after 96 hours. Further effects were observed in the kidney after 24 hours: hypertrophic nuclei of the epithelial cells, the narrowing of the Bowman space in which the red blood cells accumulated and tubules' obstruction generated by the proliferation of epithelial cells. These were followed by the tubules' necrosis at 96 hours. Most of these structural changes are considered to be incompatible with the normal functioning of the kidney.

48 hours after intoxication, the gills suffered a series of histological changes which did not alter their proper functioning: the dilatation of the marginal channel, the lifting of the lamellar epithelium, vascular congestion and, less frequently, epithelial cells hyperplasia associated with secondary lamellae fusion. On the other hand, lamellar aneurism caused by pillar cell damage, associated with the increase of sanguine flux and with the dilatation of the marginal channel is considered severe threats for normal gas exchange, excretion and osmotic regulation.

To conclude, a concentration of 0.1 mg/l is the maximum accepted limit in shallow waters due to harmful structural changes, which are also induced by other xenobiotics.

# The population structure of *Bufo viridis* in Republic of Moldova and Italy

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**Key word:** *Bufo viridis*, population structure, population size, Northen Italy, Sauthern Italy, Republic of Moldova (Codri).

In this study of *Bufo viridis* we recorded the length-weight relationship of four green toad populations over the years, in order to compare variability between localites and years. A Euroasiatic species, *Bufo viridis*, breeds in temporary pools. Four populations have been studied, the first in Northern Italy (Turin), two in Southern Italy (Paola and Amendolea) and one in Republic of Moldova (Codri). The total number of males captured varies between a minimum valuie of 34, to maximum of 164 males. The total number of females varied between a minimum of 18 to a maximum of 117. The begining of reproductive activity varied widely from one locality to another and lasted nearly 15 days. The longest period ranged from 18 to 24 days and was recorded at Codri (Republic of Moldova). At the same site a variation between years of 15 days was observed. Females are longer and heavier than males, this difference is statistically significant and persists over the years only at the Paola and Codri populations. The Amendolea population does not show a significant size dimorphism. A between years comparison highlights a degree of variability that is significant only in the Amendolea males sample. Concerning interpopulations variability, the Calabrian individuals were smaller than Codri ones in length and in weight.

# Correlations of melanism in the populations of the *Vipera berus* complex from eastern Romania

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**Key words:** reptiles, snakes, melanism, natural selection, sexual selection, predation.

The colouration of animals is considered to be an adaptation to different biotic and abiotic environmental factors. Colouration plays an important role in avoiding predation via crypsis, mimicry or aposematism, inter and intraspecific communication and sexual selection. In ectothermic animals, colouration could also be especially important in thermoregulation. Colour polymorphism (i.e. the presence of two or more phenotypic morphs in the same population) and the mechanisms which maintain it have been the subject of numerous studies, several hypotheses having been suggested.

Melanism is one of the commonest and most studied examples of polymorphism in animals and it has been reported in invertebrates as well as in all higher vertebrate groups. In squamate reptiles, melanism has been frequently observed in a large number of taxa and in the majority of the regions of the world. The ecological advantages and disadvantages of being a darker coloured reptile have benefited from intense studies in the past three decades, especially since a study on Garter snakes (*Thamnophis sirtalis*) had indicated that black specimens receive thermoregulatory advantages.

Here we investigated several correlates (frequency of melanistic individuals, body size, body mass, female reproductive characteristics) of melanism in two populations of the *Vipera berus* complex from eastern Romania in order to test previously proposed hypotheses for explaining the maintenance of colour polymorphism in squamate populations. Melanistic vipers were less frequently encountered in both studied populations than zigzag individuals. There were no significant differences in body size or body mass between the two morphs. No differences were observed regarding reproductive characteristics with the exception that melanistic females gave birth to significantly longer neonates. Our conclusions were that, for our studied populations, the maintenance of colour polymorphism is achieved mostly through non-adaptive processes.

# Feeding habits of the Eurasian otters *Lutra lutra* (Linnaeus, 1758) living in Putna Vrancea Natural Park (Romania)

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**Key words:** *Lutra lutra,* Eurasian otter, ecology, diet, feeding habits, Putna Vrancea Natural Park.

The Eurasian otter (*Lutra lutra*) has been described as piscivorous, but our recent studies suggested that the otter may be better defined as an opportunistic predator, its feeding behaviour being dependent on the availability of prey. Otter is recognized as one of the top predators in freshwater systems, and thus has the potential to play an important role in the functioning of these ecosystems.

The Eurasian otters have a diverse diet, they forage in a wide variety of different habitats from Putna Vrancea Natural Park.

Between December 2012 and September 2013, the diet of the otter was identified by collecting and examining 56 spraints (feces) from 36 sites (different habitats, streams, rivers and tributaries), from several river catchments throughout Putna Vrancea Natural Park.

The number and percentage of species that occurred per spraint was recorded and compiled for analysis. The percentage of occurrence of each species was plotted per spraint and secondly the frequency of occurrence per prey item was also calculated by dividing the total occurrence of a particular species by the total occurrence of all prey items by expressing it as the relative frequency of occurrence (RFO%).

Spraints were collected and analysed for two different periods: winter-spring and summer and also they were collected in different habitats to be able to find a seasonal difference and a spatial distribution.

In most of the spraints, fish was the main prey consumed, 31%, followed closely by amphibians with 24%, insects 21%, mammals 16% and other groups in a small amount: 3% gastropoda, 3% plantae and 2% reptilia.

Otter diet seemed influenced by the characteristics of river habitats (altitude, flow, vegetation) more than by seasonal variations.

Based on the spraints collected and analysed from the same sites, we could find information about feeding habits of different otter specimens.

# Loss of body mass of *Plecotus auritus* versus microclimatic conditions of interior during hibernation

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**Key words:** *Plecotus auritus*, body mass, hibernation, thermoregulation, microclimatic conditions.

Bats from temperate climate zones are characterized by an ability, which developed in various mammals, to intentionally lower body temperature, the purpose of which is to reduce the use of energy necessary for maintaining temperature. Despite this fact homoiothermy does not cease to function. The body thermoregulation system allows to establish an adequate temperature of an organism depending on physical conditions of the environment. This mechanism is fully active. Anytime, bat can rise or lower its body temperature under the influence of environmental conditions.

The merit of lowering body temperature is a great energy saving. Homoiothermy of mammals is connected with high energy costs. Lowering temperature by 10°C decreases the use of energy by 50-70%. The saving is double. First, an organism uses less energy for increasing internal temperature. Second, all processes of metabolism slow down due to the temperature drop, which additionally reduces the use of energy. The drawback of reduction of body temperature is limitation of ability to react of central nervous system. Therefore, bats must find a solution of crucial life issues: the level of security in a given shelter and the risk of being killed by predators due to weaker reactions, or defending territory or shelter against competitors from the same species.

Seasonal changes of climatic conditions force optimization of use of energy by bats. In Northern and Central Europe during winter period they may survive winter only when they stay in deep shelters. Important aspects are appropriately chosen physical conditions of hibernaculum (temperature, humidity, air flow velocity, thermal conduction of materials) as well as lack of threats of predators.

Duration time of hibernation depends on species and physical conditions of hibernaculum. As a result of research on wintering of Plecotus auritus in southern Poland loss of body mass during hibernation was observed (November – March) which equalled on average 2.4 g (mean: autumn 9.8 – spring 7.4 g). It may be assumed, that the bat strategy of survival during hibernation is based on minimizing the value of coefficient of heat exchange through convection and radiation, which is possible to achieve by choosing proper shelters.

# Towards a black list of invasive alien species in Romania

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**Key words:** prioritization, risk assessment, criteria, impact, non-native.

About 12000 alien species are currently estimated to occur in Europe; therefore managing all of them is impossible and also unnecessary, since not all pose threats. We need to prioritise alien species according to their impact in order to focus our attention on species of major concern and thus ensure feasible management actions and an efficient allocation of resources. Coordinated efforts at the European level and the development of a species listing system are recommended by the Council of Europe for addressing the issue of biological invasions. The species listing system has three main components: a Black List for species of high concern, a White List for species of low concern, while species not included in the previous lists or are data deficient are allocated to the Grey List (Genovesi & Shine, 2004). However, the criteria used to assign species to these lists are not standardized at the European level. We discuss the different listing approaches used by the current prioritization protocols developed in Europe, applicable to a wide range of taxa: ISEIA – Belgium (Branquart, 2007), GABLIS – Germany-Austria (Essl et al., 2011), Norway (Sandvik et al., 2013), Ireland and Northern Ireland (Kelly et al., 2013) and United Kingdom (Baker et al., 2008). We identify shortcomings in these protocols and emphasize the need for a unified view at European level and give recommendations on a standardized prioritization protocol that can be applied at different spatial scales. Using several alien insects in Romania as model organisms, we provide an example of prioritization risk assessment, thus stepping forward towards a Black List of Invasive Alien Species in Romania.

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## Invasiveness and resilience in nonmarine mollusks of Turkey

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**Key words:** Mollusc fauna, invasive species, resilience, native invaders, Turkey.

Land and freshwater mollusk faunas respond to the human modifications in several ways. Some of the species with local distributions and susceptible habitats like caves and karstic springs may quickly disappear, while some others gradually adapt to the modified environment and keep surviving in metapopulations. Some of the latter may acquire invasiveness favoring human aided dispersal, through which they eventually get (almost) cosmopolitan distributions. The Mediterranean terrestrial mollusk taxa, which adjusted themselves to a climatic regime having seasonal aridity as a natural component, show some resilience to invasion and moderate catastrophic events like wild fires and drought periods. This phenomenon can also be observed in the natural Mediterranean terrestrial ecosystems in Turkey, particularly in the absence of Western Mediterranean invasive species like *Cornu aspersum*, *Cernuella virgata* and *Eobania vermiculata* in undisturbed ecosystems. However, urbanized locations are typically characterized by a community composed of dominant or localized alien taxa mixed with some native invaders and local species. On the other hand, as freshwater mollusk communities in Mediterranean region are found to be contrastingly highly susceptible to natural events like climatic changes and the anthropogenic changes in their natural environment, nonnative mollusk taxa may pose a hidden threat although currently no direct impact could be observed.

# *Metcalfa pruinosa* in Constanța (Romania) after 5 years from the first report

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**Key words:** *Metcalfa pruinosa,* monitoring, Constanța, Romania.

The small North American Leaf hopper *Metcalfa pruinosa* Say, 1830 (Hemiptera: Flatidae) is one of the latest invasive species naturalized in Dobrogea, along with other species of insects as the East Asian ladybug *Harmonia axyridis* (Coleoptera: Coccinelidae) or North American bug *Leptoglossus occidentalis* (Heteroptera: Pentatomidae). *Metcalfa pruinosa* arrived in the littoral area most probably with seedlings of ornamental plants brought from Italy. In 2009 and 2010, the most important populations of the Leaf hopper were identified in the Neptun – Comorova area.

Five years before, *Metcalfa pruinosa* was identified for the first time in Constanța, and since then, summer after summer, the invasive species populations were observed consistently across the entire city of Constanța, from late May to mid-September.

In the summer of 2013, a monitoring program for this species took place in the city of Constanța in order to reveal how *Metcalfa pruinosa* spread in various types of urban habitats. The monitoring was carried out in June, July, August and September. Some transects were established, in order to cover all the parts of the city were *Metcalfa pruinosa* was mentioned in the past years. Each transect was covered in separate days, watching the number of colonies, abundance of the specimens and host for larval stages. The data were registered separately, and location of each colony was recorded with a GPS.

The observations were made repeatedly from the first mention of the colonies on plants of the larval stages in late May to the ending of the adult flight in September. Observation of the host plants were made in order to reveal larval stages preferences in different parts of the city. The data recorded during the monitoring program provides information on the habitat preferences of this species as well as development trends in different parts of the city.

# Monitoring of the Leaf miner *Cameraria ohridella* (Lepidoptera: Gracillariidae) in Constanța – Romania (May – October 2013)

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**Key words:** *Cameraria ohridella,* monitoring, Constanța, Roumania.

The horse-chestnut leaf miner *Cameraria ohridella* Deschka & Dimić, 1986 is the most visible invasive species in Constanța city area. The first mines on the Horse-chestnut *Aesculus hippocastanum* leaves appear in late May and larval activity can be observed throughout the warm season. The first program of monitoring of the Leaf miner within Constanța held in 2008 and since then took place several series of consecutive annual observations on the activity of defoliator and its degree of survival during the cold season.

During the summer of 2013, from May to October, we carried out a number of observations concerning the attack of the Leaf miner on the leafs of horse-chestnut trees and on the frequency of larvae. In order to observe the impact of the Leaf miner in different parts of the city, several sectors were established. In each sector transects were established, and observations were made every two weeks.

The evolution of the successive generations of the Leaf miner was registered. In addition, observations were made on the degree of infestation with parasites of the mines. The data obtained in summer of 2013 were compared with those resulting from the monitoring campaigns in previous years.

The data collected from the monitoring program can provide valuable information regarding habitat preferences of the invasive species in different areas of the city. The data also allow the drafting of a strategy for limiting the spread of defoliator in the areas with horse-chestnut trees and highlighting the complex of natural predators and parasitoids of this species.

# Unionid bivalves as a model group for studying the effects of biotic homogenization on host-parasite relationships

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**Key words:** affiliate species, Bivalvia, Europe, freshwater ecosystems, freshwater mussels, host-parasite associations, non-native species, Unionidae.

Biotic homogenization (gradual increase in biological similarity of regions) is a widespread human-induced process that shapes the composition and function of biotic communities. The combined effects of species invasions and extinctions cause that many species begin interact with novel partners, and former co-evolutionarily balanced inter-specific relationships are lost. The outcomes of these novel interactions determine the conditions for the survival and spreading of a particular species and have become one of the critical issues in both conservation and invasion biology.

I use freshwater mussels and their fish hosts to investigate how the biotic homogenization influences the ability of affiliate species to realize their strategy of inquiring host resources. The inferences are based on datasets that includes experimental evaluation of the physiological host compatibility of both endangered and invasive European freshwater mussels and the projection of the obtained host-compatibility data into the recent progress of biotic homogenization of fish communities.

Unionid bivalves demonstrate that the consequences of biotic homogenization on host-parasite relationships are primarily determined by the degree of host specificity of particular species. Highly host specific species *Unio crassus* face a potential risk of host limitation by the loss of important and declining partners in central Europe. Also, the mixing of regional biotas may lead to an over-proportional decrease of host availability for local host generalists such as *Anodonta anatina* and may have broad consequences for their population dynamics. On the other hand, broad host generalists as invasive *Anodonta woodiana* may capitalize on biotic homogenization by increased spreading abilities and the use of novel local host species throughout the world. Obviously, freshwater mussel and their fish hosts represent fruitful model for future investigations on the consequences of biotic homogenization on the coevolutionary relationships of hosts and parasites in changing freshwater environment.

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# Preliminary data on the fauna of feather mites (Acarina: Analgoidea) in Meghalaya (India)

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**Key words:** feather mites, Analgoidea, new species, birds, hosts, Meghalaya, India.

Feather mites (Acarina: Analgoidea) are commensals or ectoparasites that permanently live in the plumage and on the skin of birds. So far, above 2400 species of feather mites are described, and experts belive that the currently known number of species represents less than 20% of really existent species (Mironov, 2003).

The diversity of feather mites in India is poorly known, only 24 species being mentioned so far in a series of papers. Considering that the avian fauna of India includes over 1300 species of which 644 are present in Meghalaya (Lepage, 2013), and each of them is a potential host for several feather mite species, it is evident that the investigation of feather mites in this country is in a very early stage.

The material used in the present work was collected from Meghalaya (India), in February 2013. The birds were captured, identified and visually checked for the presence of mites and, after mites were collected, released back into the wild.

Of the 86 specimens of bird hosts, belonging to 27 species that were caught and checked for the presence of ectoparasites, 84 showed feather mites. So far, on nine passerine species of birds (Passeriformes), acarological material has been identified: *Minla cyanouroptera*, *Stachyris nigriceps*, *Alcippe nipalensis* (Timaliidae); *Turdus dissimilis*, *Myiomela leucura*, *Zoothera dauma* (Turdidae); *Hemixos flavala* (Pycnonotidae); *Hydrornis nipalensis* (Pittidae); and *Ficedula hyperythra* (Muscicapidae). In this material we identified 23 species of feather mites of which 15 are new to science and will be described: *Analges* sp. B, *Trouessartia* sp. B, *Timalinyssus* sp. A. on host ***Minla cyanouroptera***; *Analges* sp. A, *Proterothrix* sp. A, *Trouessartia* sp. C on host ***Myiomela leucura***; *Anhemialges* sp. A, *Proterothrix* sp. B, *Trouessartia* sp. D, *Proctophyllodes* sp. B on host ***Alcippe nipalensis***; *Montesauria* sp. A, *Pteroherpus* sp. A, *Trouessartia* sp. A on host ***Hemixos flavala***; *Proctophyllodes* sp. A on host ***Zoothera dauma***, and *Trouessartia* sp. E on host ***Ficedula hyperythra***.

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# Comparative study on ectoparasite infestation within the genus *Apodemus* Kaup, 1829 (Rodentia: Muridae) in relation to their habitat

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**Key words:** wood mice, field mice, habitat segregation, mites, fleas, ticks.

The genus *Apodemus* includes four species found in the Romanian rodent fauna, belonging to two subgenera, *Apodemus* and *Sylvaemus*. There is a significant habitat segregation between these species in the study area. *A. agrarius* is found in open habitats with abundant vegetation and high humidity, but also cultivated fields. *A. flavicollis* is the most widely spread and abundant rodent in the woodlands from Transylvania. It inhabits all types of forests as well as open areas in their vicinity. *A. sylvaticus* populates habitats with woody vegetation, like forest edges, shrubs, and some agricultural lands. Considered a steppe species, *A. uralensis* was found in cultivated fields but also in humid habitats. Data on ectoparasites hosted by *Apodemus* mice were collected from 776 animals captured in 10 areas across Transylvania, beginning with 2004. All the four groups of ectoparasites known from rodents were found, namely Acarina (including Ixodoidea), Siphonaptera, Anoplura, and Coleoptera. Among parasite taxa, mites (Gamasidae and Trombiculidae) were most common, followed by fleas, ticks, lice, and beetles, represented by *Leptinus testaceus*, identified only on *A. flavicollis* in mountain areas. The total ectoparasites' prevalence was 79.9%. The effect of some biotic and abiotic variables (locality, altitude, season, year, host age and sex) was tested using Pearson chi-square test of independence. The difference in the external parasites infestation pattern among the four species was analyzed in relation to their habitat.

# New findings of parasite fauna of Ohrid moranec (*Pachychilon pictum* Heckel & Kner, 1858) (Teleostei: Cyprinidae) from Lake Ohrid, Macedonia

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**Key words:** parasite, Moranec, Lake Ohrid.

Lake Ohrid is the oldest lake in Europe. The lake is inhabited by 17 autochthonous species, of which 10 species (60%) are endemic.

Within the parasitological examinations of the fishes from the Macedonian part of the Lake Ohrid 226 specimens of the endemic fish species Ohrid moranec (*Pachychilon pictum* Heckel & Kner, 1858) were comprised, of which 117 specimens (51.77%) were infected.

In our case study the presence of 7 parasite species was evident: *Dactylogyrus caballeroi, Plagioporus stefanskii, Cystidicoloides tenuissima, Contracaecum microcephalum* (larva), *Metechinorhynchus salmonis, Pomphorhynchus laevis* and *Pomphorhynchus bosniacus.*

Separately, by parasite species, the highest prevalence is with *Dactylogyrus caballeroi* (44.69%), and the lowest prevalence is with *Plagioporus stefanskii* (0.44%).

*Plagioporus stefanskii* is mentioned in our study for the first time in the ichthyoparasitofauna of Lake Ohrid and Macedonia.

The parasites of the Ohrid moranec are mostly freshwater forms, with one element that is common to both marine and fresh waters (*Metechinorhynchus salmonis*).

One aspect of the parasites found, is their wide area of distribution and wide spectrum of hosts, such as: *Cystidicoloides tenuissima, Contracaecum microcephalum* (larva), and *Metechinorhynchus salmonis.* But, *Pomphorhynchus bosnicus* is stenoparasite or at the border of stenoparasitism, because it is confined within the Balkan Peninsula, especially on its western part.

# New findings of parasite fauna of endemic salmonid's fishes from Lake Ohrid (Macedonia)

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**Key words:** parasite fauna, *Salmo letnica, Salmo ohridanus*.

Lake Ohrid is situated in the Ohrid valley and occupies the farthest southwest part of the Republic of Macedonia. It belongs to the category of oligotrophic lakes.

Lake Ohrid fish fauna is represented by 17 autochthonous species, among which 60% are endemic in terms of species or subspecies. Ten species are commercially important, priority being given to the two endemic and relic trout species - Ohrid trout (*Salmo letnica* Karaman, 1924) and Belvica (*Salmo ohridanus* Steindachner, 1892).

In order to explore the parasite fauna of endemic fishes from Lake Ohrid, sampling of fish material was carried out by seasons in one year.

During that period, 203 specimens of fish were caught, which belong to 2 species: Ohrid Trout - *Salmo letnica* and Ohrid Belvica - *Salmo ohridanus*.

Parasitological examinations of the fish from the Macedonian part of Lake Ohrid were made on 78 specimens of Ohrid's trout (*Salmo letnica* Karaman, 1924), of which 59 fishes (75.64%) were infected. We determined the presence of 4 parasite species in Ohrid's trout (*Salmo letnica*): *Eubothrium crassum, Cyathocephalus truncatus, Proteocephalus neglectus* and *Pomphorhynchus laevis*.

Parasitological examinations of the fish from the Macedonian part of Lake Ohrid were made on 125 specimens of the Ohrid's belvica (*Salmo ohridanus* Steindachner, 1892), of which 68 fishes (54.40%) were infected. We determined the presence of 7 parasite species in Ohrid's belvica (*Salmo ohridanus*): *Discocotyle ohridana* n.sp., *Nicolla testiobliqua*, *Eubothrium salvelini*, *Metechinorhynchus truttae, Metechinorhynchus salmonis, Acanthocephalus anguillae* and *Pomphorhynchus bosniacus*.

# Influence of *Borrelia* and *Anaplasma* on behaviour of lizard genus *Lacerta*

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**Key words:** parasitic manipulation, Host-parasite interactions, *Lacertidae, Borrelia, Ananplasma,* Open field test.

Alteration of host behaviour caused by pathogens has now been documented in hundreds of distinct associations spanning all major phyla of living organisms. The strategies of pathogens employ to reproduce and spread are extremely complex and thought provoking. Elucidating these mechanisms remains as the core of applied aspects of parasitology.

The aim of the current study is to investigate the effects of spirochete genus *Borrelia* and rickettsial bacterian genus *Anaplasma* on the specific behavioral forms of lacertid lizards. The infection with *Anaplasma* and *Borrelia* in three species of the genus *Lacerta* (*L.viridis, L.agilis* and *L. trilineata)* was evaluated. Lizards were captured in Slovakia and Romania. Behaviour of 106 individuals was monitored using an open-field test. Subsequently, all tested animals were examined for the presence of pathogens using PCR methods. Preliminary results show a correlation between the infectious state of the lizards and the mean speed without resting (i.e. speed while producing sustained effort). The individuals infected with *Anaplasma* had a lower mean speed than uninfected lizards. Moreover, the individuals with coinfection (*Borrelia* and *Anaplasma)* had higher mean speed than the ones infected only with *Anaplasma*. Further, individuals infected with *Borrelia* had a longer total trajectory than non-positive lizards for *Borrelia* infection.

Complex research requires significant input from field study, laboratory experiments and molecular analysis. The results are most likely to produce information of behavioural and parasitological interest and may help to elucidate the pathogen's life cycle as well as the effect on its host.

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# Thermoregulation of Green lizard, *Lacerta viridis*, parasitized by blood parasites

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**Key words:** *Lacerta viridis,* thermoregulation**,** host-parasite associations, intraerythrocytic parasites.

Reptiles are hosts for a variety of parasites which can influence their behavior. Oppliger et al. (1996) found that the multiplication rate of the parasites depends on the temperature at which the lizard is maintained. He suggests that the parasites may suffer reproductive costs when hosts reduce their body temperature.

In our research we monitored the infestation by blood parasites in European Green Lizard, *Lacerta viridis*. Lizards were captured in 3 different locations in Slovakia (Slovak karst NP, NR Burda). We recorded their body temperature and the teperature of the environment. We analysed 57 blood samples microscopically and by molecular methods using PCR reactions with HEP300/HEP900 primers targeting part of the 18S rRNA gene (Üjvári et al., 2004). Results were subsequently correlated with body temperatures of both, infected and uninfected individuals. We confirmed 2.75% positive samples. Preliminary results suggest lower body temperature of infected lizards**.** The research is still in progress and it promises more compelling results in the future.

The aim of the study is to elucidate the effect of blood parasites on thermoregulatory behaviour with focus on Common Green Lizard. Monitoring the preference of thermal spectrum of infected and uninfected lizards in their natural habitat and in experimental conditions will be conducted. Comprehensive study is essential in order to understand the co-influence of blood parasites and their hosts.

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# Parasite-host interactions *in vivo* between *Borrelia burgdorferi* and laboratory small animals

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**Key words:** parasite-host interactions, *Borrelia burgdorferi*, tick-borne pathogens, small animals.

Tick-borne diseases are of increasing public health concern because of range expansions of both vectors and pathogens (Daniel et al., 2003). Lyme borreliosis is the most common arthropod-borne human disease in temperate regions of the northern hemisphere. The causative agents of Lyme borreliosis (and other tick-borne borrelioses) are spirochaetes belonging to the *Borrelia burgdorferi* species complex. It is well known that *B. burgdorferi* are unique among the pathogenic spirochaetes by requiring obligate blood-feeding arthropods for their transmission and maintenance in vertebrate host populations.

Using the green fluorescent line Bb 914-GFP of *Borrelia burgdorferi*, we conducted short-term and long-term infection experiments, using either the intradermal or the intravenous route of inoculation. Kupffer cells, the resident macrophages of the liver, are normally responsible for the rapid clearance of *B. burgdorferi* from the bloodstream. To prolong the circulation of the spirochetes in the cardiovascular system and to facilitate interactions between the spirochetes and the cerebral microvasculature, we depleted mice of Kupffer cells with liposome-encapsulated clodronate. *Borrelia burgdorferi* infection of Kupffer cell-deficient but not control mice resulted in a time-dependent disruption of the integrity of the blood-brain barrier as measured by leakage of the tracer Evans blue. While cerebral veins and sinuses were strongly affected, capillaries remained intact suggesting that the neuroimmunological, but not the physiological blood brain barrier was disrupted by *B. burgdorferi* infection. Intravital microscopy showed arrested spirochetes in the cortical microvasculature that were associated with aggregates of marginalized platelets suggesting that the infection caused focal intravascular coagulation. Spirochetes were also found within the cerebral parenchyma. Together, these data suggest that long-term circulation of *B. burgdorferi* in the bloodstream facilitates spirochete extravasation into the brain tissue. It also appears that *B. burgdorferi* infection leads to inflammatory injury of vascular endothelia, which ultimately results in focal disruption of the blood brain barrier.

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# Distinctive viral variants of Porcine Reproductive and Respiratory Syndrome in Romanian territory

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**Key words:** PRRS, Romanian virus variants, DNA sequences, evolution.

Porcine reproductive and respiratory syndrome virus (PRRSV) is a highly infectious RNA virus, which is responsible for abortions, mummified fetuses and respiratory diseases in the swine farms. The PRRSV is one of the most economically important diseases in swine production. This virus had the earliest evidence in 1979 in Canada and in 1980 were described cases in regions from North America, Europe and East Asia. Some regions are currently free of PRRS: Australia, Cuba, Norway, etc (Zimmerman et al., 2011). The virus is classified in the family Arteriviridae, order Nidovirales. The virion is strucurated as an enveloped virus that contains: a nucleocapsid protein, a nonglycosylated membrane protein and a surface glycoprotein (encoded by open reading frame 5) (Calvert et al., 2013). In Romania the virus was first detected in 1998.

Detection of PRRS virus is best performed using molecular biology techniques like the Real Time Polymerase Chain Reaction (qPCR).

In this study, we analyzed 66 samples from different pig organs from farms in Arad, using qPCR and 4 were detected as positive. The genetic marker used for the detection of the virus was ORF5 gene. The qPCR is a biochemical technology used to amplify a single or a few copies of a piece of nucleic acid, generating thousands to millions of copies of a particular sequence. For the specificity of the reaction, a positive control was used, represented by the vaccine strain (Porcilis) and a negative control (water), to check if the amplification process is correct and there are no contaminants. The qPCR reaction was performed on a LightCycler 2.0 machine, by Roche. The PCR products were sequenced, using a genetic analyzer, to confirm the occurrence of type 1 of PRRSV in Romania and establish the genetic diveristy of the virus among some reference strains from genetic data bases (Zaulet et al., 2012).

The obtained sequences showed multiple nucleotide differences and provided information regarding the genetic diversity of the virus on the territory of Romania.

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# Biodiversity protection, that is a new Noah's Ark – entry on the board only for beautiful, useful and well-known species

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**Key words:** biological diversity, species and habitats protection.

Biodiversity refers to the variety and variability among living organisms and the ecological complex in which they occur. Ecological communities are composed by certain number of species, and each one of these species has a particular importance within the community.

According to the Millennium Ecosystem Assessment, the total number of species of the Earth ranges from five to 30 million and only about 2 million species have been formally identified.

The known number of species is highly biased in favor of the larger, more charismatic plants and animals, notably vertebrate animals and vascular plants. Most of the world's species at risk of extinction are neither particularly attractive nor obviously useful, and consequently lack conservation support.

Knowledge of World fauna is unevenly balanced. Taxonomic groups of which individuals are easily observable, well-know and admired species, variously called „flagship", „charismatic", „iconic" economically significant or practical significators for nature conservation are subject to sustained scientific attention. These are extremely attractive, large entertaining or useful, and they receive the lion's share of public and private financial support, publicity, research, awareness of the protective legislation**.** For these groups, i.e. vertebrates, ground beetles, butterflies, the number of recorded species probably reflects quite accurately the real number of existing species.

In 2010, the International Year of Biodiversity, an agreement sponsored by the United Nations and representing 193 countries committed to: (1) protecting 17 % of the planet's terrestrial ecosystems and 10 % of marine and coastal areas, (2) cutting the extinction rate in half by 2020, and (3) providing financial assistance to poorer nations to meet these goals (Secretariat of the Convention on Biological Diversity, 2011). This would seem to indicate substantial progress. However, the realistic and authoritative analysis (Mora & Sale, 2011) is shockingly pessimistic about biodiversity conservation.

Aesthetic and commercial standards have become the primary determinants of which species in the natural world deserve conservation. Accordingly the world's biodiversity is being beautified by selective conservation of attractive species, while the plight of the overwhelming majority of species when they are small or obscure, difficult to study or regarded as of no direct human interest, e.g. many groups of invertebrates, recorded totals are likely to reflect only a part of the real number of existing species are receiving limited attention.

Small (2011) concluded that "Noah's Ark" is the best metaphor to express the actual crisis in protection of the biodiversity.

Conclusion is very simple, may be a little trivial, but in reality very important: the Biodiversity conservation necessarily considers both species and maybe above all their habitats, since for most purposes they are inseparable. On this way we can protect not only "charismatic" species but a lot of undiscovered species, too.

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# National parks and public perception of national parks in Turkey: a case study

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**Key words:** National parks, Nature protection, benefits, university students.

Natural parks are among the highest level protected areas of nature areas in Turkey. Their planning and administration is largely conducted by a central office, therefore public opinion is often not involved and public perception may be driven by different factors. To understand the public perception on various aspects of national parks among university students in Burdur, a case study has been implemented. In the qualitative study on the views of educated students in Mehmet Akif Ersoy University (Burdur, Turkey), in the 2011-2012 education year, half configured discussion forms consisting of closed and open ended questions has been prepared and Science and Technology teacher candidates were asked to answer them in a written way. The data gathered were analyzed by means of qualitative analysis techniques. As far as the locations with longest stay is involved, it is concluded that among the candidates 27.64% were found to express and 27.88% couldn't correctly express the names of the visited natural areas, which were visited mainly for sightseeing purposes. 60.58 % of the students emphasized the protective features, when the benefits of the natural parks are asked, most of the students mentioned informative character and 29.32% have stated that it is a must to raise public consciousness on protection of national parks.

# Spatial and time trends based on long term data analysis of mammal populations in Romania

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**Key words:** mammal populations, significant trends detection, Mann-Kendall, Sen nonparametric tests.

Population data on mammal species of community importance located in Romania (listed in Annex II of the Habitats Directive) have been analysed to reveal their trends for the period 2001-2012. The analysed data (within the last 12 years) are based on population estimated and reported by the game management authorities. Data analysis allowed the identification of trends in the case of 5 species (*Ursus arctos*, *Canis lupus*, *Lynx lynx*, *Felis silvestris* and *Canis aureus*). For trend detection we have used Sen's Method and the non-parametric test of Mann-Kendall. Both methods are working well for datasets with outliers and data errors and also make no assumptions on the data distributions. Trends and significance of the trends were calculated for each of the hunting funds that reported data on the mentioned species. These trends were integrated into Arc-GIS, resulting species trend maps. All species are under direct human pressure being hunted under special conditions with the exception of wolf populations that are freely hunted.

Overall, in the last 12 years (from 2000 to 2012) no trend was observed for *Felis silvestris* at national level. Increasing population trends have been identified for *Ursus arctos*, *Canis lupus*, *Canis aureus* and *Lynx lynx*. In even longer time frame the mentioned species showed a more complex dynamics. The wolf population decreased over long time frame as compared with the 1955 (from more than 4000 individuals in 1955 to 2700 in 2012). The bear population increased over long time frame from 1000 individuals in 1940 to more than 6000 individuals in the last years. Finally the lynx population showed increased population numbers as compared with 1950 (from 500 individuals in 1955 up to 2500 in the last years). For *Felis silvestris* and *Canis aureus* we were not able to compile long term datasets.

# Distribution and habitat selection of wintering birds in the Special Protection Area ROSPA0071 „Lower Siret Meadow" (Eastern Romania)

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**Key words:** wintering birds, monitoring, conservation, Lower Siret Meadow, Special Protection Area.

The ecosistems from the Special Protection Area ROSPA0071 „Lower Siret Meadow" in the sector analysed (36492 ha, between Adjud city,Vrancea county and Şendreni village, Galaţi county), present a scientific interest because of the geographical, ecological and biological characteristics. The ornithological importance of the area consists from the fact that it is placed over an important migration route, breeding territory and wintering habitat for many bird species.

In the actual context in which Romania assumed to maintain stable populations from some species to ensure long term conservation, the detailed knowledge of the elements that define the conservation status is mandatory. The paper treats details like the number of individuals, the spatial distribution, availability of suitable habitats and threats, necessary data for the evaluation of the conservation status.

This paper presents the data obtained in the period 2009-2013 from 48 field visits in the Special Protection Area ROSPA0071"Lower Siret Meadow", all made in the hiemal season. The observations were made as an activity of monitoring the protected bird species distribution and habitat selection of wintering populations. Five important sites were identified as being used by wintering birds here. During the monitoring actions, sixty-eight bird species were identified. The paper brings new data about the way birds use the areal and existing habitats for wintering.

# Successfully managing in an area of the Common Reed (*Phragmites australis*) reduces the effect of environmental variables and improves the conditions of three species of *Acrocephalus*

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**Key words:** wetlands management, birds, *Phragmites australis*, *Acrochephalus*, successfully managing, estuary of Villaviciosa.

We present the results of the bird ringing of the Aquatic Warbler (*Acrocephalus paludicola*), the Reed Warbler (*Acrocephalus scirpaceus*) and the Sedge Warbler (*Acrocephalus schoenobaenus*), in the constant effort bird ringing station of the estuary of Villaviciosa, in the Atlantic coast of the North of Spain, in the period 2004-2012, relating the data produced in the bird ringing station with environmental variables and management actions in the area of the Common Reed (*Phragmites australis*). The data used fot the study were from May 20 to July 15 in the Reed Warbler (*Acrocephalus scirpaceus*), period in which this bird breeds in the area of the Common Reed (*Phragmites australis*), in the esturay of Villaviciosa (González et al., 2007), and August and the first half of September in the Aquatic Warbler (*Acrocephalus paludicola*) and the Sedge Warbler (*Acrocephalus schoenobaenus*), period in which the bulk of migration, in the post breeding migration, of these species in the estuary of Villaviciosa is bigger in the area of the Common Reed (*Phragmites australis*) (González et al., 2007).

Management actions improve the habitat for these species linked to the conservation status of the area of the Common Reed (*Phragmites australis*), especially the Aquatic Warbler (*Acrocephalus paludicola*), vulnerable in the IUCN Red List of Threatened Species and considered prioritary for the European Commission.

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# Habitat use by muskox *Ovibos moschatus* (Zimmerman, 1780), in Yakutia (Russia)

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**Key words:** Muskox, Yakutia, Arctic, satellite tagging collar, reintroduction.

Aborigine tundra muskox (*Ovibos moschatus*) has a number of adaptations to life in the subarctic stringent conditions. These are: a thick, long coat with underfur, the ability to effectively use the micorelief and microclimatic characteristics of the environment and relatively low level of metabolism. They determine the seasonal rhythm of life, and the nature of use of the area in different seasons of the year. These features of the species biology were preadaptations to the new circumstances of their reintroduction in the Arctic Yakutia.

By the beginning of the Holocene muskox habitat has declined significantly: they are preserved only in the far north of Siberia and North America. In Siberia, muskoxen died out 3-4 thousand years ago. In October 1996, the first batch of muskox (24 sixmonth calves) was delivered from the Taimyr to Bulunsky region of the Sakha Republic (Yakutia). By 2000, free-living populations of muskoxen were created on the peninsula Terpye-Tumus in the Lena Delta, on the island of B. Begichev Khatanga in the Gulf and in the lower reaches of Indigirka, near the village Chokurdakh.

In October 2012, we carried out on satellite tagging collars one of the females in the herd of 22 animals. We got an hour data animal movements from October 2012. During the formation of lower winter temperatures, increasing wind speed, and also an increase snow cover, we observed changes in the movement of animals in extreme conditions, thus the time the herd spends huddled and inactive increases losing less energy.

The distribution of herds in the territory is not uniform, mainly fattening goes along rivers that are most rich in shrubs and herbaceous plants, also in the rivers there are place, of maximum winds blowing out of the Arctic, where the food is produced more easily.

The depth of the snow cover and the availability of feed are the main factors that influence to the distribution of animals in winter. They choose to graze snowy areas that are often have little food, but do not require a lot of energy on getting food. In this - the manifestation of the adaptation of pasture species.

# Habitat suitability modeling for the Grey wolf *Canis lupus* (L., 1758) in Putna-Vrancea Natural Park, Romania

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**Key words:** *Canis lupus*, habitat suitability models, Vrancea, MaxEnt.

Wolf is a highly adaptable species, occupying a wide variety of habitat types and being able to tolerate certain levels of anthropogenic disturbance. Nevertheless, it's initial home range was significantly reduced and the lack of suitable habitats led to an increased need to understand how environmental variables can affect species distribution and habitat selection. Limited habitat accessibility for researchers and managers, together with the elusive behaviour of wolves makes it difficult to obtain reliable information on species distribution, therefore developing models to make predictions from incomplete data is highly important. Habitat suitabilty models are usually based on presence-only occurence records and associated environmental covariates. This study aims to: i) establish the main habitat variables that models distribution of wolves in Putna-Vrancea Natural Park (PVPN); ii) identify potential anthropogenic barriers to wolf movement in the study area. PVNP overlaps the central-north-western part of Vrancea Mountains and is covered mostly with dense forests and many remote areas. It is characterized by low settlements density, and high density of forest roads due to the development of forestry activities. Data for wolf locations were gathered from transect surveys, camera trapping and opportunistic surveys, performed from 2011 to 2013. Environmental covariates were selected based on knowledge on habitat requirements and wolf's ethological aspects identified from literature. The data were analysed using maximum entropy distribution modeling - Maxent. Among the tested habitat variables associated with wolf distribution and abundance in PVPN, forest cover, slope and type of roads were the most significant. Of all analysed anthropogenic barriers, only national roads seem to influence wolf dispersal in the study area. Identifying suitable habitat for wolves can help reaserchers and wildlife managers to conduct more focused studyes and surveys or to adapt management activities and plans to specific delineated areas.

# Comparing two techniques for rapid assessment of Brown bear abundance in Romania

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**Key words:** brown bear, abundance, transect, camera trap, Romania.

There is high uncertainty around brown bear (*Ursus arctos*) abundance in the Romanian Carpathians, which affects the ability of management agencies for setting biologically-meaningful hunting quotas. Current estimations of abundance do not rely on modern statistical techniques, and lack uncertainty estimates. In this study, we tested the use of two cost-effective sampling techniques for estimating brown bear abundance from unmarked individuals in an occupancy framework: (1) track counts on 2-km forest road segments, and (2) camera traps within 3x3 km grids. We collected track count and camera trap data using repeated surveys during Spring and Fall 2011, and Spring 2012 in four Hunting Management Districts in Eastern Carpathians. From track data recorded on snow or mud, we estimated mean seasonal abundances per transect of 1.34 (95% Credible Interval: 0.96-2.70), 1.65 (0.72-3.72), and 1.43 (0.88-3.00) bears/transect, respectively. Camera trap data were less reliable (insufficient detections during Spring 2011); mean abundances were 1.29 (0.40-3.52) and 2.78 (0.58-5.95) bears/3x3 km grid for the last two seasons. Detection probability varied across seasons (0.2-0.5), and was consistently lower for camera traps (0.2-0.25). Variables used to model abundance had low explanatory power. Considering bears/transect estimates and a mean home range of 14 $km^2$ (calculated from independent telemetry data), we calculated densities of 10 (7-17), 12 (5-25), and 10 (6-18) bears/100 $km^2$ for the three seasons. We conclude that track count data yields more reliable estimates of brown bear abundance compared to camera traps. We suggest implementing a mark-recapture DNA-based study to validate our estimated abundances.

# An equivocal relation between demographic structures of harvested brown bears and damage occurrence in the Eastern Romanian Carpathian Mountains

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**Key words:** brown bear, hunting, trophy, damage, livestock, Romania.

Under the terms of the Bern Convention and the European Union Habitat Directive brown bears (*Ursus arctos*) are protected in Romania, though they are hunted according to a yearly revised quota. This harvest quota is basically set due to the population size in the hunting units and the number of nuisance reports. To clarify if the present hunting method is responding to these regulations, we analyzed the impact of overall 341 hunted bears with sex and age profiles on 343 damage reports on livestock and agricultural fields between 2007 and 2011 in three counties of the Eastern Romanian Carpathians. The data analyses revealed no correlation between the harvest rates and the number of damages across the years, except for the autumn hunting seasons, indicating that bears generally were removed from the population selectively or by their availability. Even the bear density estimates reflected hunter takes overall poorly. 65% of bears removed in the study area were more than 8 years old with a median age of 9 years. Overall, removal was strongly male-biased (84%), basically due to the high proportion of hunted males over 8 years (66%). According to the CIC Hunting Trophy Rating 49% of the male bear skulls obtained more than 55.00 points corresponding to a gold medal. We conclude that the current bear hunting management represents a poor tool for damage mitigation in the study area but shows a strong tendency for the persisting trophy hunting. The present hunting pattern that favors removal of large adult males may have negative consequences for bear population dynamics.

# Perspectives for reintroducing physically disabled bears into the wild: the case of a 3-legged-bear

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**Key words:** bear, disabled, reintroduction, monitoring, Romania.

In August 2012 a six months old male bear cub was found injured and abandoned by the female at the Olt River bank in Bixad (Covasna County, Romania). Hit by a train he lost his right foreleg and was unable to follow the sow. The ARMU - Animal Rescue Mobile Unit – created within the LIFEURSUS Project (2010-2013) took immediate actions and transported the bear to the Animal Rescue Centre in Focșani where the cub underwent medical surgery. During his recovery of eight months at the centre he had minimal human contact, therefore developing wary behaviour towards people. Due to a positive development of his physical condition and comportment the 3-legged-bear was relocated to the orphan bear cub centre in Bălan (Harghita County) (Bereczky, 2010). He was equipped with a GPS collar to ensure further monitoring of his behaviour. From there he was "soft" released, e.g. bears have the possibility to leave the facility and come back through an open gate. He left the rehab centre in June 2013 and established his home range in the Hășmași Mountains near the rehab centre. We compared his home range size and daily movements to two other non-disabled bears of the same age (Pop et al., 2012). Our study bear does not show any abnormal behaviour in roaming, but it is clearly limited in daily covered distances. So far, we consider the reintroduction of this bear as successful in terms of chances of survival and we will further monitor him with great interest. Our study can be of great importance for assessing survival rates of disabled animals in the wilderness.

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# Biodiversity of the Horseshoe bats (Chiroptera: Rhinolophidae) at the Alfa and Beta levels in the Carpathians Mts.

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**Key words:** Carpathians Mts., Rhinolophid bats, quantitative evaluation of bat fauna, species richeness gradient, biodiversity Alfa and Beta.

The Carpathians Mts. are an important eco-region offering for bats suitable conditions for hibernating, shelters for nursery colonies and foraging areas. Of the 45 European bat species, 32 are reported from this area. This means about 70 % of whole bat fauna of Europe. Among five species of Rhinolophidae from the Carpathians Mts., only *Rhinolophus mehelyi* has the northern limit of its areal in Dobrudja, on the line of Bucharest and the Danube River. The other four species are distributed in the Carpathians. *R. blasii* occurs in the Southern Carpathians. *R. euryale* has northern limit of its distribution in Southern Slovakia and two last horseshoe bat species i.e.: *R. hipposideros* and *R. ferrumequinum* have their northern limit in Southern Poland (North of the Carpathians Mts.).

The most commonly considered facet of biodiversity is the species richness – the number of species in a site. The ratio between number of species and number of individuals is called Diversity index.

Generally, there is a decrease in biodiversity from the south to the north. We can also observe these phenomena in the Carpathians Mountains. A gradient of species richness may be identified in the Carpathians Mts. We can observe loss of species number along this gradient. Bat species density responded almost linearly to change in latitude.

Diversity index is a measure of the number of species in a community and their relative abundances; such measures include the ratio between number of species and number of individuals

The diversity of species within a particular habitat or community is called **Alfa** diversity. A measure of the rate and extend of change in species along a gradient from one habitat to others is called **Beta** diversity.

We have compared diversity of bat fauna in seven localities: three from Romania (Cloşani cave, St. Grigore Decapolitul, and Gura Ponicovej); one from Slovakia (Drenovska cave) and three from Southern Poland: Diabla Dziura w Bukowcu, Mroczna w Kornutach and Małe Pieniny Mts.).

For the evaluation of the horseshoe bat fauna at **Alfa** level was used Margalef' index ($\mathbf{D_{MG} = S - 1 / LnN}$). There are important differences between compared regions. Alfa diversity index in the investigated caves in Romania is relatively low: from 0.40 to 0.83 in the northern part of the Carpathians (in the Beskidy Mts.) it is between 0.73 to 1.26 to South. Biodiversity at **Alfa** level is higher when at similar number of species, the number of specimens is lower.

For comparation bat fauna diversity at **Beta** level we used Jaccard's index ($\mathbf{I_j = c/ a + b - c}$).

Similarity of bat fauna during the hibernation period between Southern Carpathians Mts. (Romania) and Northern Carpathians (Beskidy Mts. Poland) at Beta level is relatively low, from 0.28 to 0.30.

# Conservational methods in preserving animal bones: short review

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**Key words:** conservation, animal bones.

Animal bones can usually be found beside human bones, ceramics and textiles during archaeological excavations. Usually, these are bones of domestic animals and they can display processes of domestication, modes of agricultural management and hunting of the people who lived in the territory long ago. One of the most important steps of conservation is keeping the bone intact so that its structure reflects the original state as much as possible. This can be reached through correct methods of collecting, conservation and storage.

There are a lot of conservation methods. One of the simplest methods is cooking the bones, however, more useful chemical methods have been developed as well. The most important phases that every method has to include are: removing fat from the bone structure, disinfection, bleaching and drying.

During this research most of known methods were collected with the help of different publications, observations, work of archaeological departments in some of the biggest museums of Serbia and in the neighboring countries.

After the process of collecting and observing, every method should be verified with experiments, and the most useful phases would be chosen to create a new conservation method. However, it is very important that the chosen phases work together in a proper way. At the end, the whole method must meet the following requirements: the conservation must be safe so it will not expose anyone to any disease or sickness under the conservation process and later on, in the exhibition at the museum; the material and the method used has to be such that it does not harm the bone; efficacy in terms of a good result in a reasonable time, easy usage and to be cost efficient.

# POSTER PRESENTATIONS

# The first records of *Pritha nana* (Filistatidae) and *Oecobius maculatus* (Oecobiidae) from the Crimea

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**Key words:** Araneae, Filistatidae, Oecobiidae, the Crimea, Ukraine.

The material was collected by the group of students and M. Fedoriak and O. Iaroshynska as supervisors in June, 2011 during the summer practice on the territory of the summer camp "Environmental guard" at Cape Aya (44°25'11"N, 33°41'22"E). We used different methods in various habitats and collected about eight hundred specimens representing 70 species (preliminary data). The most interesting are Filistatidae and Oecobiidae species which were not previously mentioned for Ukraine.

Family Filistatidae contains archaic haplogyne cribellate spiders. The family has almost worldwide distribution with 17 genera and 115 species so far (Platnick, 2013). Palaearctic species occur in southern regions. Recently *Pritha crosbyi* (Spassky, 1938) was recorded from Azerbaijan (Marusik & Guseinov, 2003) and *Pritha* sp. – from the Abrau peninsula (Russia, Krasnodar Krai) (Ponomarev & Volkova, 2013). There are also records of filistatids from Ukraine but without specifying of species (Evtushenko, 2004; Marusik & Kovblyuk, 2011). We collected 18 males and 2 females of *Pritha nana* (Simon, 1868) in the woods of *Juniperus excelsa, Pinus stankewiczii, Pistacia mutica*. *P. nana* is the northernmost species of the whole family (Marusik & Guseinov, 2003).

Family Oecobiidae contains 110 cribellate species belonging to 6 genera (Platnick, 2013). The family has a wide distribution and includes two cosmopolitan species. All previously recorded Oecobiids from Ukraine were collected indoors (Evtushenko & Singayevsky, 2008; Fedoriak & Zhukovets, 2010). For the first time 4 males of *Oecobius maculatus* Simon, 1870 were collected using pitfall traps on the territory of the summer camp (*Juniperus excelsa*).

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# Identification of prostigmatid mites associated with oleaster trees in Hamedan Province, western Iran

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**Key words:** phytophagous, predatory, mites, fauna, oleaster, Iran.

Prostigmatid mite fauna of oleaster trees, *Elaeagnus angustifolia* L. (Elaeagnaceae), in Hamedan province were studied during 2011–2013. The mites of the foliage samples were obtained by shaking method and also Berlese funnel was used to extract the soil and litters specimens under oleaster trees. The specimens were mounted directly on slides in Hoyer's medium. In this study in total 19 species belonging to 12 genera and seven families were collected and identified. Among them family Stigmaeidae with 7 species was found frequently. One species from this family was new for the world acari fauna and marked in the text by asterisk (*****). The collected mites according to the family, genus and species are as follows: **Anystidae:** *Anystis baccarum* (L., 1758); **Caligonellidae:** *Molothrognathus fulgidus* Summers & Schlinger, 1955; *Molothrognathus mehrnejadi* Liang & Zhang, 1997; *Neognathus terrestris* Summers & Schlinger, 1955; *Neognathus* sp.*****; **Cheyletidae:** *Cheletomimus vescus* Qayyum & Chaudhri, 1979; *Cheletogenes ornatus* Canestrini & Fanzago, 1876; **Raphignathidae:** *Raphignatus hegmataniensis* Khanjani & Ueckermann, 2003; *Raphignathus gracilis* Rack, 1962; **Stigmaeidae:** *Stigmaeus elongates* Berlese, 1886; *Stigmaeus boshroyehensis* Khanjani, Izadi, Asali Fayaz, Raisi, Rostami & Doğan, 2010; *Stigmaeus cariae* Khanjani, Pishehvar, Mirmoayedi & Khanjani, 2012; *Stigmaeus pilatus* Kuznetsov, 1978; *Eustigmaeus dogani* Khanjani, Asali Fayaz, Mirmoayedi & Ghaedi, 2011*; Eustimaeus segnis* Koch, 1836; *Ledermuelleriopsis zahirii* Khanjani & Ueckermann, 2002; **Tenuipalpidae:** *Aegyptobia tragardhi* Sayed, 1950; *Cenopalpus prunusi* Khanjani, Khanjani, Saboori & Seeman, 2012; **Tetranychidae:** *Tetranychus urticae* Koch, 1836.

# Fauna of the family Raphignathidae (Acari: Prostigmata) in Hamedan Province, Iran

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**Key words:** Acari, new, *Raphignathus*, predatory mites, Iran.

Raphignathoid mites are important to biological control agents of spider mites, eriophyid mites, and scale insects in agriculture and forestry (Fan & Zhang, 2005). They are found in various ecosystems: foliage, branches, trunks, moss and lichen, litter, soil, animal nests, stored products, and even in house dust. Family Raphignathidae belongs the superfamily Raphignathoidea, this family comprises two genera namely: *Raphignathus* Dugés and *Neoraphignathus* Smiley & Moser. Genus *Raphignathus* Dugés, 1834 occurs all over the world. To date, 11 species of genus *Raphignathus* have been recorded and described from Iran (Khanjani et al., 2013). During 2009-2011, fauna of the family Raphignathidae in Hamedan province was 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 8 species, belonging to genus *Raphignathus* were identified. *Raphignathus hecmataniensis* Khanjani & Ueckermann, 2002 is widely distributed in Hamedan province and occurs on different hosts. Identified species are listed as follow: *R. collegiatus* Atyeo, Baker and Crossley, 1961; *R. gracilis* (Rack, 1962); *R. zhaoi* Hu, Jing & Liang, 1995; *R. hecmataniensis* Khanjani & Ueckermann, 2002; *R. protaspus* Khanjani & Ueckemann, 2002; *R. ensipilosus* Meyer & Ueckermann, 1989; *R. aciculatus* Fan & Yin, 2000 and *R. hatamii* Khanjani, Pishehvar, Mirmoayedi & Khanjani, 2013.

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# Fauna of the family Stigmaeidae (Acari: Prostigmata) in Zanjan county, Iran

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**Key words:** Acari, species, Stigmaeidae, predatory mites, Iran.

The family Stigmaeidae Koch belongs to the superfamily Raphignathoidea and contains 32 genera, of which 10 genera are recorded from Iran (Khanjani et al., 2012). Genus *Stigmaeus* Koch is one of the genera which members are predators feeding on scale insects and occurs all over the world. To date, 27 species of the genus have been recorded and described from Iran. During 2011-2013, fauna of the family Stigmaeidae in Zanjan county was studied. In this order, litter and soil samples were taken to the laboratory. Mites extracted by Berlese/Tulgren setup and mounted directly in Hoyer's medium. In total 11 species, belonging to 3 genera were identified. Among them, one species is new to the world mite fauna which was marked with asterisk (*). Also *Stigmaeus shabestariensis* Haddad Irani-Nejad, Lotfollahi, Akbari, Bagheri & Ueckermann, 2010 had high populations in certain locations. Identified species are listed as follow: genus ***Eustigmaeus*** Berlese, 1910: *E. dogani* Khanjani, Asali-Fayaz, Mirmoayedi & Ghaedi, 2011; *E. nasrinae* Khanjani & Ueckermann, 2002; *E. segnis* (Koch, 1836); genus ***Ledermuelleriopsis*** Willmann, 1953: *L. punicae* Khanjani, Ghiasi, Izadi & Mirmoayedi, 2012; *L. zahirii* Khanjani & Ueckermann, 2002; genus ***Stigmaeus*** Koch, 1836: *S. boshroyehensis* Khanjani, Izadi, Asali-Fayaz, Raisi, Rostami & Doğan, 2010; *S. elongatus* Berlese, 1886; *S. haddadi* Bagheri & Zarei, 2012; *S. pilatus* Kuznetzov, 1978; *S. shabestariensis* Haddad Irani-Nejad, Lotfollahi, Akbari, Bagheri & Ueckermann, 2010; *S. zanjanicus****sp. nov.**

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# Faunistic study of the genus *Eustigmaeus* (Acari: Stigmaeidae) in some parts of western and north–western Iran

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**Key words:** mite, prostigma, soil, litter, moss, Iran.

The family Stigmaeidae after Phytoseiidae is the second important predatory mite family in subclass Acari. Currently this family contains more than 32 different genera and the genus *Eustigmaeus* Berlese, 1910 is one of the largest group in the family Stigmaeidae that generally are free living on mosses, lichens, grass, litters and a few are parasitic on sand-flies. In this order, specimens were collected from soil, litter and moss under cultivate and uncultivated plants including plum, almond, apple, apricot, gum, grass or moss in some parts of western and North-western Iran (Hamedan, Kurdistan, Kermanshah and Western Azarbaijan provinces), using a Berlese funnel, during 2010-2012. The specimens were prepared and examined on microscope slides in Hoyer's medium and under an Olympus BX51 microscope (DIC), respectively. The identified species were as follows: *E. dogani* Khanjani, Asali-Fayaz, Mirmoayedi & Ghaedi, 2011; *E. jiangxiensis* Hu, Chen & Huang, 1996; *E. nahidae* Gheblealivand, Bagheri & Ghorbani, 2012; *E. nasrinae* Khanjani & Ueckermann, 2002; *E. rhodomela* (Koch, 1841) (was observed as first record for Iranian fauna); *E. sculptus* Doğan, Ayyıldız & Fan, 2003; *E. segnis* (Koch, 1836) (Khanjani & Ueckermann, 2002; Khanjani et al., 2011; Khanjani et al., 2013). Among them *E. nasrinae* was found abundantly in different ecosystems and with highly distribution.

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# Phoretic, parasitic and predatory mites associated with sucker and borer pests in Hamedan orchards (Iran)

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**Key words:** aphid, scale insect, wood–boring insect, biological control.

Acari is a unique subclass in the class of Arachnida which is abundantly found in various types of ecosystems including agroecosystems. Phytophagous mites can be detrimental to some crops, however parasitic and predatory species act as significant biological control agents. The predatory, parasitic and phoretic mites associated with fruit pests including aphids, scales and wood–boring insects were collected in orchards of Hamedan during 2010–2011. 22 species from 16 different genera and 10 families were identified. The first report for Iranian fauna and the new species were indicated by one and by two asterisks, respectively.

**# Order Mesostigmata**

**+ Family Ascidae Oudemans, 1905**

– *Lasioseius youcefi* Athias–Henriot, 1959

**+ Family Phytoseiidae Berlese, 1916**

– *Typhlodromus* (*Anthoseius*) *iraniensis* Daneshvar & Denmark, 1982

– *Typhlodromus* (*Anthoseius*) *khosrovensis* Arutunjan, 1971

– *Typhlodromus* (*Anthoseius*) *bagdasarjani* Wainstein & Arutunjan, 1967

– *Neoseiulus barkeri* Hughes, 1948

– *Neoseiulus agrestis* (Karg, 1960)

– *Kuzinellus kuzini* (Wainstein, 1962)

**# Order Prostigmata**

**+ Family Caligonellidae Grandjean, 1944**

– *Molothrognathus mehrnejadi* Liang & Zhang, 1997

– *Molothrognathus azizi* Khanjani & Ueckermann, 2003

– *Neognathus terrestris* Summers & Schlinger, 1955

**+ Family Cheyletidae Leach, 1815**

– *Cheletomimus vescus* (Qayyum & Chaudhri, 1979)

– *Cheletogenes ornatus* (Canestrini & Fanzago), 1876

**+ Family Erythraeidae Oudemans, 1902**

– *Erythraeus* (*Erythraeus*) *garmsaricus* Saboori, Cobanoglu & Bayram, 2004

**+ Family Eupalopsellidae Willmann, 1952**

– *Eupalopsellus hamedaniensis* Khanjani, Eghbalian, Ueckermann & Pourmirza, 2007

**+ Family Raphignathidae Kramer, 1877**

– *Raphignathus hegmataniensis* Khanjani & Ueckermann, 2002

– *Raphignathus gracilis* (Rack, 1962)

– *Raphignatlius emirdagiensis* Akyol & Koç, 2006*

**+ Family Stigmaeidae Oudemans, 1931**
– *Zetzellia pourmirzai* Khanjani & Ueckermann, 2008
– *Stigmaeus elongatus* Berlese, 1886
– *Ledermuelleriopsis aryaii* **sp. nov**. **
**+ Family Trombiididae Leach, 1815**
– *Monotrombium simplicium* Zhang, 1995
**+Family Tydeidae Kramer, 1877**
– *Tydeus electus* Kuznetzov, 1973

# Faunistic study of spider mites in vicinity of Hamedan, Iran

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**Key words:** spider mites, fauna, Hamedan, Iran.

Spider mites are the most significant pests on different plants all over the world. The pests are collected from many parts of Iran such as Tehran, Hamedan, Golestan, Kordestan, Ardebil, Fars, Khozestan, Khorasan and Azarbayjan on some fruit trees, field crops and green house plants. Spider mites are consisted of a few distinction species and have a destructive role on plants by sucking of leave sap or cumulative frequency around stem and buds. Moreover, they are very tiny with high population in reproduction and have a short life-cycle. Identification of these pests is considered as the first step in Integrated Pest Management. Thus, during 2009-2010 the study conducted to recognition of spider mites on many plants in Hamedan where there are the most important area aspects of many farms and orchards in the west of Iran. It was depicted that *Tetranuchus urticae*, *Tetranychus turkestani*, *Eutetranychus orientalis*, *Petrobia lateens*, and *Bryobia rubrioculus* were in a high range of population with the vast dispersion in this region. *Tetranuchus urticae* had the utmost population in different plants, however, it is considered that *Bryobia rubrioculus* is the most crowded on sweet-cherry and black-cherry. The results could be used to application of natural enemies against these pests as a method of integrated pest management.

# Diversity of centipedes in different types of ecosystems from the Buila-Vânturarița National Park (Romania)

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**Key words:** fauna, centipedes, endemic, Buila Vânturarița.

The research area, Buila Vânturarița National Park is situated in the Southern Carpathian Mountains and comprises a limestone massif that extends on SW-NE direction. Within an area of 4186 ha there are mostly forests, meadows and rocky habitats. Until 2011, only five centipede species were known to exist within the Buila-Vânturarița NP, with other eight reported in the north side of Vâlcea county.

The aim of the study was to obtain data regarding the distribution and status of centipedes species present within the park boundary. Ten random unit samples of leaf litter and soil (25 cm × 25 cm) were collected from different types of habitats (riparian, mixed/ beech/ spruce forest, mountain meadow) and hand sorted. Pitfall traps and manual collecting were also used to complete the information.

Fourteen species, belonging to five genera and four families (Linotaeniidae- one species, Mecistocephalidae - one species, Lithobiidae - ten species, Cryptopidae - two species), were collected and identified, raising the taxa list for the area to 16 centipede species. From the studied habitats, beech forests are preferred, being the richest in both species diversity (12 species) and numerical abundance. Fauna composition with many relict species suggest that habitats are in good state. Four identified species (*Dicellophilus carniolensis*, *Harpolithobius anodus anodus*, *Lithobius schuleri* and *Lithobius burzenlandicus*) are included in the Carpathian List of endangered species. There are some species of great importance for the park, like *Harpolithobius radui* (present in Romania and Bulgaria only) as well as endemic *Harpolithobius triacanthos* and *Lithobius decapolitus*.

# Faunistic data concerning centipedes (Myriapoda: Chilopoda) from Doftana Valley, Prahova county (Romania)

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**Key words:** centipedes, fauna, invertebrates, Doftana Valley.

Doftana Valley is situated north of Prahova county, where the river has its source in Baiu Mountains, belonging to the Curvature Carpathians, and runs for almost 50 km before flowing into Prahova River. The drainage basin encompasses different types of habitats, especially many mature beech forests. Within the area, two protected sites were designated and included in the European network Natura 2000 - ROSCI0153 - Glodeasa Forest and ROSCI0283- Doftana Gorges. There are no published information on centipedes from this area, and just a few on other invertebrate taxa.

The paper presents faunistic data regarding centipede fauna from Doftana River Valley, upstream and downstream of Paltinu dam lake, Romania. The material was collected between 2008-2013 from several localities along forest, alluvial shrubs and cliff ecosystems. Notes were made regarding altitude, geographical coordinates, slope, type of soil, while (for at least a year) temperature and humidity at soil surface was recorded in three sites. The most common taxa within scolopendrid centipedes were *Cryptops parisi* and *Cryptops hortensis*, frequent and abundant in deciduous forests. Among examined lithobiids there were identified the wide European-distributed *Lithobius forficatus*, Central European species *Lithobius schuleri* and *Lithobius mutabilis*, Carpathian-Balkan species *Lithobius parietum*. For every identified species, data on distribution range and ecology of these species are presented. All centipedes species in the taxa list are mentioned for the first time in the investigated area.

# Collembolan communities (Hexapoda: Collembola) from the Buila-Vânturarița National Park (Romania)

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**Key words:** Collembola, Buila-Vânturarița National Park, first record, rare species, Romanian fauna.

In 2011 we carried out faunal investigations in the vernal, estival and autumnal seasons in the Buila-Vânturarița National Park using quantitative sampling methods (pitfall traps). We sampled fauna in five types of habitats: riparian, beech forest, mixed forest, coniferous forest and alpine meadows. The study of collembolan communities revealed 67 collembolan species belonging to 35 genera, 12 families and 3 orders.

*Coloburella linnaniemii* (Denis, 1926) is recorded for the first time in the Romanian fauna.

The presence of *Ceratophysella gibbosa* (Bagnall, 1940) in the Romanian fauna has been put in question by Fiera (2006). The species was recorded as *Ceratophysella* cf. *gibbosa* (Bagnall, 1940) (Fiera, 2007). After we investigated our faunistic material, we consider that this is the first reliable record of *Ceratophysella gibbosa* (Bagnall, 1940) in the Romanian fauna.

The rare species *Vertagopus westerlundi* Reuter, 1898, *Xenylla schillei* Borner, 1903, *Ceratophysella granulata* Stach, 1949, *Pseudachorutes corticicolus* (Schaffer, 1897) and *Archaphorura serratotuberculata* (Stach, 1933) are presented here.

Up to now, there were no studies concerning the collembolan fauna from the Buila-Vânturarița National Park. Therefore, the purpose of this study is to present a first evaluation of the collembolan fauna, taking into consideration that this is a protected area (national park category II IUCN).

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# Remarks on several catching methods used in collecting true bugs (Insecta: Heteroptera)

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**Key words:** pitfall trap, sweep net, efficiency, highest activity, sampling methods, Romania.

True bugs are a relatively large group of insects but due to the high diversity of this suborder, the job of making a complete list of species for a hotspot location may prove to be difficult. The purpose of the present study was to determine what collecting method and period is suitable for catching a high number of species from different types of microhabitats. In order to establish this thing, a number of five collecting methods (pitfall trap, sweep net, Malaise trap, sticky trap and pan trap) were tested in five habitats (plum orchard, hayfield, swamp, river shore and farmland) near Satchinez village. Considering the fact that the sampling methods are working differently in different environments (Schuh & Slater, 1995), a preliminary study was conducted. The preliminary data suggested that only two methods (pitfall trap and sweep net) are caching a high number of species. Based on these data we continued the sampling with those two methods for a period of one year (March 2012-March 2013).

The number of individuals collected by pitfall traps reached the highest point in July, other two small peaks were observed in March and October. The majority of individuals captured by this type of sampling method are belonging to Lygaeidae family and the highest number was caught in the plum orchard.

In the case of sweep net sampling two big peaks were observed, one in July and other in October, the highest number of species being collected in the hayfield, mostly belonging to Miridae family.

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# Water crickets of Romania, with the first record of *Velia serbica* Tamanini, 1951 (Heteroptera: Veliidae)

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**Key words:** aquatic bugs, true bugs, water bugs, new records, Carpathians.

Little is known about water crickets (Veliidae) in Romania. Ilie and Davideanu (2007) listed the following six species for our country: *Velia rivulorum* Fabricius, 1775, *V. currens* Fabricius, 1794, *V. saulii* Tamanini, 1947, *V. caprai* Tamanini, 1947, *V. mancinii* Tamanini, 1947 and *V. affinis* Kolenati, 1857. Until the revision of Tamanini (1947), several species were misidentified under the name of *V. currens* and *V. rivulorum* throughout Europe. Benedek (1969) has also proved, during his revision in the Carpathians, that specimens previously identified as *V. currens* belonged to *V. caprai* and *V. saulii*, and those identified as *V. rivulorum* were in fact *V. mancinii* specimens.

Therefore, based on material collected between 2010-2013, in Romania, preliminary results show that *V. caprai caprai* and *V. saulii* are widely distributed in the entire Carpathians, *V. mancinii mancinii* and *V. serbica* occur in south-western Carpathians, whereas *V. affinis filippii* Tamanini, 1947 is restricted to Dobrogea. In the European context, the pattern is somehow similar: *V. caprai* and *V. saulii* are the most common species, with a wide distribution, *V. mancinii mancinii* and *V. affinis filippii* occur in the Balkan Peninsula, while *V. serbica* is limited to Serbia and Bulgaria.

Thus, *V. serbica* is recorded for the first time in Romania and the occurrence of *V. saulii* is confirmed. *V. currens* and *V. rivulorum* were not found during this study. Considering their central and west Mediterranean distribution pattern, it is unlikely that these species occur in Romania.

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# Bush-crickets, crickets and grasshoppers (Insecta: Orthoptera) from Berca Mud Volcanoes (Buzău, Romania)

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**Key words:** Orthoptera, Berca Mud Volcanoes, Romania, faunistics.

Berca Mud Volcanoes are a geological and biodiversity reserve (ROSCI0272 "Vulcanii noroioşi de la Pâclele Mari şi Pâclele Mici") located near Berca village, in Buzău County. Mud volcanoes, formed by the eruption of mud and natural gases, create a strange lunar landscape, due to the absence of vegetation around the cones. As the soil is very salty, only few plants can survive, such as *Nitraria schoberi*, located here at the western border of its distribution area. A sylvosteppic vegetation developed around the volcanoes, with pontic and submediterranean elements: *Stipa stenophylla, Agropyron intermedium, Festuca valesiaca, Adonis vernalis, Inula ensifolia* etc.

During several collecting trips, made between 2010-2013, 45 species of bush-crickets, crickets and grasshoppers have been recorded in the area of the Mud Volcanoes, the most abundant being: *Leptophyes albovittata* (Kollar), *Poecilimon fussii* Brunner von Wattenwyl, *Tettigonia viridissima* (Linnaeus), *Decticus verrucivorus* (Linnaeus), *Metrioptera bicolor* (Philippi), *Gryllus campestris* Linnaeus, *Omocestus rufipes* (Zetterstedt), *Stenobothrus lineatus* (Panzer), *Chorthippus biguttulus* (Linnaeus) and *Chorthippus parallelus* (Zetterstedt).

Some interesting steppic Orthoptera species populate this isolated sylvosteppic habitat, such as: *Isophya rectipennis* Brunner von Wattenwyl, *Platycleis striata* (Kittary), *Pholidoptera frivaldskyi* (Herman), *Onconotus servillei* Fischer de Waldheim and *Chorthippus mollis* (Charpentier). Near the volcanoes, *Oedipoda caerulescens* (Linnaeus) and *Aiolopus thalassinus* (Fabricius) adapted perfectly to the harsh habitat.

# Bush-crickets, crickets and grasshoppers (Insecta: Orthoptera) from Putna-Vrancea Natural Park (Romania)

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**Key words:** Orthoptera, Putna-Vrancea Natural Park, Romania, faunistics, distribution.

Putna-Vrancea Natural Park is located in the central-north-western part of Vrancea Mountains, covering the whole mountain zone of Putna River basin, with an area of 38.204 ha – representing 41.32% of the mountains in Vrancea County. It overlaps with ROSCI0208 "Putna-Vrancea" and ROSPA0088 "Vrancea Mountains". The main subunits of relief in Putna-Vrancea Natural Park are: Lăcăuţi-Goru Mountains, Coza Mountain, Lepşa and Zboina Neagră. Goru Mountain is the only strictly protected area in the park, covering 60.41 ha.

In the period 2012-2013, during an ample research project investigating the fauna of Putna-Vrancea Natural Park, 53 species of bush-crickets, crickets and grasshoppers have been found – a remarkable 27.89% from the 190 species of Orthoptera known to occur in Romania.

Apart from typical mountain species (*Tettigonia cantans* (Fuessli), *Metrioptera brachyptera* (Linnaeus), *Pholidoptera frivaldskyi* (Herman), *Tetrix bipunctata* (Linnaeus), *Arcyptera fusca* (Pallas), *Psophus stridulus* (Linnaeus), *Omocestus viridulus* (Linnaeus), *Chorthippus pullus* (Philippi), *Chorthippus montanus* (Charpentier), *Pseudopodisma transilvanica* Galvagni & Fontana), an interesting steppic element was discovered in Vrancea Mountains: *Isophya zubowskii* Bey-Bienko. Other remarkable findings are *Isophya ciucasi* Iorgu & Iorgu and *Poecilimon affinis* (Frivaldszky), both being recorded for the first time in Moldavia. *Pholidoptera transsylvanica* (Fischer), species encountered in several locations high in the mountains, is the only protected bush-cricket from Putna-Vrancea Natural Park.

# The Orthoptera (Insecta) from middle and lower Prut River basin

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**Key words:** Orthoptera, distribution, Prut, Romania, Republic of Moldova.

The middle and lower Prut River forms the natural border between Romania and Republic of Moldova. Along its course, a vast mosaic of habitats may be encountered, from aquatic, marsh habitats and riparian forests to steppic mesophytic and xerophytic meadows, providing perfect biotopes for a large number of bush-crickets, crickets and grasshoppers species.

The taxonomy, ecological preferences, bioacoustics and spatial distribution of Orthoptera species were studied in middle and lower Prut River basin, in both Romania and Republic of Moldova. This research begun in the year 2000 and was conducted in 57 localities in Romania and 41 localities in Republic of Moldova. A total number of 88 species of bush-crickets, crickets and grasshoppers were collected in the study area: 84 species were encountered on the western banks of Prut River and 75 species were found on its' eastern shores.

Interesting species, such as *Barbitistes constrictus* (Fabricius), *Poecilimon fussii* Brunner von Wattenwyl, *Metrioptera roeselii fedtschenkoi* (Saussure) and *Pholidoptera frivaldskyi* (Herman) are recorded for the first time in the Orthoptera fauna of Republic of Moldova. Although the species *Gryllomorpha dalmatina* (Ocskay) was encountered only on the eastern shores of Prut River, it is likely that this elusive species exists also in Romania.

# Four new records for *Trichodes quadriguttatus* Adams, 1817 (Insecta: Coleoptera: Cleridae) in Romania

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**Key words:** *Trichodes quadriguttatus*, Cleridae, Romania, range limits.

Until now, the species *Trichodes quadriguttatus* Adams, 1817 is known only from Dobrogea. 140 specimens from various collections ("Grigore Antipa" National Museum of Natural History from Bucharest, The Natural Sciences Museum of Piteşti, The Eco-Museal Research Institute of Tulcea, "Mircea Alexandru Ieniştea" collection, author's personal collection) were investigated. After examining the Cleridae collection of "Grigore Antipa" National Museum of Natural History from Bucharest, three other collecting sites can be added: Bragadiru – Ilfov county, Cama islet on the Danube – Giurgiu county, Cheia, near Măneciu - Prahova county. Also, eleven specimens were collected by the author at the Văcăreşti lake, in Bucharest.

*Trichodes quadriguttatus* is a thermophilous species, common in Dobrogea but very rare in Muntenia. It has been collected at altitudes between 0 and 800 m, from various habitats (grasslands, ruderal areas, broad-leafed forest edges) on the following species of flowering plants (*Cirsium* sp., *Daucus carota, Leucanthemum* sp., *Sambucus ebulus*). The collecting interval of the investigated specimens is comprised between 4th June and 21 July. The general distribution of the species includes Serbia and Montenegro, Bulgaria, Greece, Turkey, Siria, Iran, Israel, Jordania, Transcaspia and Kazakhstan (after Gerstmeier, 1998).

Based on the literature and collecting data we can conclude that the range possibly enlarged, probably due to the global warming.

**References:**

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# New records or rare species of Lepidoptera (Insecta: Lepidoptera) from the North-East part of Romania

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**Key words:** Lepidoptera, new records, distribution, Romania.

In this paper the authors present new faunistical data collected during the last 2 years (2012-2013) in the North-East of Romania, between the Prut River and the Siret River, in the Moldavian Plain. The studied area is part of the Continental biogeographical region.

The species were collected using a light trap (50-250 watt).

The following species have been recorded for the first time in the North-East of Romania: *Cilix asiatica* O. Bang-Haas, 1907, *Craniophora pontica* (Staudinger, 1878), *Eutelia adulatrix* (Hübner, 1813) and *Acontia* (*Emmelia*) *candefacta* (Hübner, 1831).

New collecting places for several species which have few records in Moldova (Romania), such as *Parahypopta caestrum* (Hübner, 1808), *Paracossulus thrips* (Hübner, 1818), *Dyspessa ulula* (Borkhausen, 1790), *Proserpinus proserpina* (Pallas, 1772), *Eilicrinia cordiaria* (Hübner, 1790), *Aethalura punctulata* (Denis & Schiffermüller, 1775), *Idaea politaria* (Hübner, 1799), *Polyphaenis sericata* (Esper, 1787), *Eucarta amethystina* (Hübner, 1803), *Anarta* (*Calocestra*) *stigmosa* (Christoph, 1887), *Saragossa porosa* (Eversmann, 1854), *Chelis maculosa* (Gerning, 1780) are presented.

# Urban ecosystems: preliminary studies regarding the vertebrate fauna of Văcărești Lake (Bucharest, Romania)

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**Key words:** Văcărești Lake, vertebrates, fauna, urban ecosystem.

Urban areas have always been discussed in biology papers based on their impact on the surrounding environment, as a cause of habitat destruction, alteration and fragmentation. Still, even some of the greatest anthropogenic features sometimes contain within important natural areas, which have been shown to play a crucial role in the well-being of the people, act as survival reservoirs for different species of animals and regulate the microclimate. The main aim of the current pending study is to provide a baseline assessment of the vertebrate fauna in Văcărești Lake, a large naturalized area in the center of Bucharest.

Methods used comprised nets for capturing fish, standard transects for amphibians, reptiles and mammals, while for birds transects were combined with fixed observation points. GPS coordinates were recorded for all observed individuals using dedicated GPS units.

During the field activities 6 species of fish were identified - *Leucaspius delineatus*, *Perca fluviatilis*, *Pseudorasbora parva*, *Lepomis gibbosus*, *Ictalurus punctatus*, and *Gambusia hoolbroki*; 3 species of amphibians - *Hyla arborea*, *Bombina bombina*, *Pelophylax ridibundus*; 5 species and two subspecies of reptiles - *Emys orbicularis*, *Trachemys scripta scripta*, *Trachemys scripta elegans*, *Lacerta viridis*, *Lacerta agilis*, and *Natrix natrix*; and 6 species of mammals: *Ondatra zibethica*, *Arvicola terrestris*, *Mustela nivalis*, *Crocidura suaveolens*, *Rattus norvegicus*, and *Vulpes vulpes*. The bird fauna is represented by 60 species of which 16 are featured in Annex I of the Birds Directive.

Văcărești Lake features a mosaic of habitats with a relatively high diversity of species, some of which are protected by national or international laws. Also, the complex can offer valuable insight into the natural evolution of highly disturbed ecosystems.

# A rapid survey of the herpetofauna from the upper Topolog River basin

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**Key words:** herpetofauna, *Vipera berus*, Southern Carpathians, Topolog river.

The Carpathian arch, with its vast forests and long winding river systems, may well be one of the last untouched ecosystem in Romania and probably of all Europe. The Southern Carpathians host a large array of habitats, from the bald high peeks through the dens pine forests to the long and narrow corridors carved by rapid mountain rivers. In the current paper we present our results from a herpetological survey that took place along one of Southern Carpathians river systems. Said survey was conducted over a four-day period in the summer of 2013, along a 15 km path following the upper course of the Topolog River and one of its tributaries, the Topologel stream. Data were collected from ten sites which were chosen on the field as most suitable for observations, ranging from around 950 m a.s.l. to over 1500 m a.s.l. We documented three species of reptiles and five species of amphibians, all except one, being previously recorded from the neighboring area. The "exception" is the European common adder (*Vipera berus*), which we observed in two separate sites that were situated at the beginning and the end of our trail. Although, over the years 13 species of herpetofauna were described in the same general area, our survey indicates the presence of only eight species of amphibians and reptiles on our path along the Topolog and Topologel. This being said, after what we observed we can deem the habitats along this river system to be suitable for the rest of five species.

# First record of *Sterna hirundo* nesting inside Bucharest

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**Key words:** *Sterna hirundo*, migratory birds, nesting, Bucharest, Tineretului Park.

The common tern, *Sterna hirundo*, is a frequent summer guest, arriving from their winter quarters in the second half of April. The species is breeding on coastal marshes and islands, but also on the shores of inland lakes, on pebbly beaches (where it makes rudimentary nests) or on floating vegetation, in which case the nest is more substantial including vegetal debris. The bird nests in simple or mixt colonies and, more rarely, in isolated pairs. The brood consists of between one and three eggs incubated for 20-23 days by both parents. The chicks are able to swim at a few days and are fed by both parents for up to 28 days when they are able to fly.

Here, we report the first recorded case of an isolated pair of common terns breeding inside Bucharest nesting on an artificial "island" formed between two logs on the Tineretului Lake for three years (2010, 2011 and 2013) and record its presence on other lakes of Bucharest. Usually, the observations begin in the last part of April and last until the second part of September. In 2010, the first chicks were recorded at 24$^{th}$ of June, in 2011 at 9$^{th}$ July and in 2013 at 22$^{nd}$ June.

Although *Sterna hirundo* has been observed in several other places inside Bucharest (Lacul Morii (Ciurel), Herăstrău Park, A. I. Cuza Park, and along the Dâmboviţa River at Izvor Park, Piaţa Unirii and The Court of Bucharest), we can record its nesting only inside Tineretului Park.

# Small mammal fauna in forest ecosystems of Kishinev city, Republic of Moldova

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**Key words:** forest ecosystems, insectivores, rodents, bats, urban environment.

The green areas of the cities represent important habitats for wild mammal fauna in urban environment. The studies were accomplished during 2011-2013 in forest ecosystems of Kishinev city and its surroundings. The forests ecosystems are represented by city parks, Botanical garden, forest plantations and remains of natural forests around the city (Durleşti, Dănceni, Băcioi, Suruceni, Sociteni, Vadul-lui-Voda). The used methods were the direct observations during several days each month, collecting and determination of trophic remains (pellets), catching with traps (small mammals).

The mammal fauna of Kishinev city and its surroundings is rather rich, being registered mammals species. There were recorded 6 insectivore species (*Erinaceus concolor, Talpa europaea, Sorex araneus, S. minutus, Crocidura leucodon* and *C. suaveolens*), 15 rodent species (*Dryomys nitedula, Muscardinus avellanarius, Sciurus vulgaris, Nannospalax leucodon, Ondatra zibethicus, Apodemus sylvaticus, A. uralensis, A. flavicollis, A. agrarius, Mus musculus, M. spicilegus, Arvicola terrestris, Microtus rossiaemeridionalis, Pitymys subterraneus* and *Clethrionomys glareolus*) and 9 bat species (*Rhinolophus hipposideros, Myotis mystacinus, M. daubentonii, Nyctalus noctula, Pipistrellus pipistrellus, P. pygmaeus, Eptesicus serotinus, Plecotus auritus, P. austriacus*).

The semi-aquatic Water vole and the Muskrat were recorded in or near various water basins (lakes, ponds, rivers, swamp sectors) within forest biotopes from city surroundings and in city parks. The open land species (House mouse, Mound building mouse, East European vole), were recorded at forest edge and in shelter belts. The majority of the species have rather well adapted to anthropic disturbances and recreational activity of people, while other species became very rare in surroundings of the city, such as Pigmy shrew, Brown long-eared bat, Whiskered bat, Pigmy pipistrelle.

After the ecological analysis of mammal groups, it was emphasized that the species diversity (Shannon index) is the lowest in urban parks (0.38) and the highest in the woods (1.47), surrounding Kishinev city and in paludous biotopes situated near or in woods (1.14).

The studies were performed within the project for young researchers 12.819.18.06A "Diversity, importance and adaptive peculiarities of terrestrial vertebrate fauna (mammals, birds, reptiles, amphibians) in recreational and urban ecosystems", financed by Academy of Sciences of Moldova.

# Phenotypic variability in dentition of suines in the Chalcolithic period in Romania

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**Key words:** variability, dentition, suines, Chalcolithic, Romania.

The distinction between domestic and wild forms of *Sus scrofa* is often difficult due to the coexistence of these two forms in Neolithic period and it is possible that in archaeological samples occur hybrid forms which make the identification complicated. The morphological variation seen in the molar of swine was described by the two-dimensional projection of the tooth viewed from its occlusal surface. The geometric morphometric approaches on molar tooth was used in this goal. The advantages of geometric morphometric are the visualization and the possibility to use mathematical data for multivariate statistics. The osteological material used in analysis (the lower second and third molars of pig and wild boar) came from archaeological sites of Romania territory dating form Chalcolithic period (4500 - 3000/2500 B.C.) (Cucuteni Culture and Gumelnița Culture).

Among the three permanent molars, the lower second molar ($M_2$) and lower third molar ($M_3$) ones represent key phenotypic markers to examine phenotypic diversity and the domestication process in pigs.

Our results reveal similarities between the Neolithic pigs in Cucuteni and Gumelnița Cultures, but in the same time show models of significantly different variation. The variability of the lower second molar targets the distal-labial cusps: hypopreconulid and protoendoconulid (central cusps).

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# An osteometric survey of pig (*Sus domesticus*) in Bronze Age settlements on Romania's territory

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**Key words:** osteometric data, pig, Bronze Age, Romania.

The purpose of this paper is to outline the osteometric variation of pig from the Bronze Age settlements in Romania. The bone remains came from Romanian assemblages which dating to: Early (3500-2200 BC), Middle (2200-1600/1500 BC) and Late Bronze Age (1600/1500-1100 BC).

A considerable problem for archaeozoologists is to clearly assign the bones remains as *Sus scrofa* or *Sus domesticus*, taking in account their coexistence in the samples. For this reason, new biometric data which could contribute in a better separation of wild and domestic forms are agreeable. Therefore, we propose to characterize and distinguish interpopulational differences in pig of Bronze Age samples.

The descriptive analysis was realized out separately for each variable. We described the variability using coefficient of variation (CV%), which is dimensionless and allows a comparisons of variability of large and small bones.

The following anatomical elements were analyzed: mandible, maxilla, humerus, scapula, radius, tibia, calcaneus and astragalus. Our results reveal that the lower third molar is the most distinctive character that can characterize different populations of pigs (CV%=1.4-1.8). The size increase of pig from Early Neolithic to Late Bronze period is obviously according to statistical analysis. Our study offer some range sizes of anatomical elements which can be used like a criteria to identify domestic swine remains.

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# *Procambarus clarkii* (Girard, 1852) (Crustacea: Decapoda: Cambaridae) as a carrion-feeder: decomposition and colonization in fresh water

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**Key words:** forensic entomology, colonization, freshwater, *Procambarus clarkii*, decomposition.

The presence and activity of animals, both vertebrates and invertebrates, on human cadavers can accelerate the processes of decomposition because of dismemberment, tissue laceration and consumption, as well as increase of temperature caused by the animal metabolism. Moreover postmortem animal feeding activity may cause considerable damage to bodies resulting in the modification of wounds, loss of identifying features, and injury or removal of internal organs. Until now, the majority of the published studies and observations concerning the post mortal modifications by animals on carrions and human cadavers have been carried out in terrestrial environments, mainly on exposed bodies. Unlike the situation on land, little information is available in the case of drowning or dead bodies discarded in aquatic environments (e.g., lakes, rivers, sea). However, in the last years several authors tried to bridge this knowledge gap both for freshwater and sea environments. Anyway, aquatic insects and other arthropods can be useful in estimating a Postmortem Submersion Interval (PMSI). The knowledge about the different "waves" of colonization of a submerged body remains incomplete and several differences have been reported case by case.

In these studies, different experiments were performed in Northern Italy to investigate the effect of crustaceans feeding on carcasses placed in freshwater with a particular attention to *Procambarus clarkii* (Girard, 1852) an alien species introduced in France, Italy and other European countries in 1970-1990. The experience started in 2012's spring and is still taking place. Carcasses of young pigs (*Sus scrofa*), dead by natural causes, were positioned into the water, inside lobster pots, in order to control the population of crustaceans feeding on the carcass. In the preliminary study it has been notified, for the first time in specialized literature, the great influence that *P. clarkii* has in the decomposition in freshwater environment, with connections between population, water temperature and carrions' stage of decomposition.

More deepened experiments are taking place with a major number of carrions, to investigate the decomposition in different seasons, the type of wounds and the population trend in *P. clarkii* feeding activity during different stages of decay. The first results show two peaks in the population trend in two important stages of decomposition: the first exposure to the environment and the end of the floating stage, when the carcass becomes submerged again. Further studies are investigating the outline of wounds, which could be mixed up with sharp injuries or gunshot wounds.

# A checklist of arthropods collected on rat carrion, *Rattus norvegicus* (Berkenhout, 1769), in Yaounde (Cameroon)

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**Keys words:** *Rattus norvegicus*, Carrion, Carrion-feeding insect, Cameroon.

Five different stages of decomposition of rat carcasses were observed: Fresh, Bloated, Putrefied, Dried and Skeletonised. A total of 29112 Arthropods belonging to four taxonomic classes and 18 orders were collected on 72 rats' carcasses. Blowflies (Diptera) where the first to colonize the corpses, followed by beetles (Coleoptera) and Acari which arrived during advanced decay. These taxa dominated the carrion-feeding arthropod community. This study enables an overview of the carrion-feeding insect on rat in Cameroon. They were dominated by Diptera: *Hemipyrellia fernandica*, *Chrysomya putoria* and *Calliphora* sp. (Calliphoridae), Drosophilidae, Lauxaniidae, *Ophyra* sp. (Muscidae), Phoridae, Piophilidae, *Sarcophaga zumpti*, *Sarcophaga inaequalis*, *Sarcophaga* sp. (Sarcophagidae), Sciaridae and Sepsidae; Coleoptera: Carabidae, Dermestidae, Hydrophilidae, Mordellidae, Ptiliidae, Staphylinidae and *Necrobia rufipes* (Cleridae); Hymenoptera: *Coelalysia* sp. and *Apanteles* sp. (Braconidae), Chalcididae, *Paramesius* sp., *Basalys* sp. and *Trichopria* sp. (Diapriidae), *Crematogaster* sp., *Lepisiota* sp., *Monomorium* sp., *Tetramorium* sp., *Pheidole* sp. and *Odontomachus* sp. (Formicidae), and *Dicroscelio* near *poussi* (Scelionidae) and Acari.

# Experimental colonization of *Calliphora vicina* (Robineau-Desvoidy) (Diptera: Calliphoridae)

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**Key words:** *Calliphora vicina*, life table, survival rate, Iran.

The urban bluebottle blowfly, *Calliphora vicina* (Robineau-Desvoidy), is considered a valuable tool in forensic entomology science for determining the PMI. The life table of *C. vicina* was evaluated with two diets in laboratory.

The adult flies were collected from Kan, northwest of Tehran, Iran. The colonies were maintained continuously at 24 ± 1°C with 12:12 light and dark photo period in 60% ± 5% relative humidity. This rearing process was continued until the fifth generation.

For the life table study from the fifth generation, 10 batches of Hundred-triad eggs laid were collected from cage and put on fresh beef and artificial food as two food regimens (five replicates for each diet). The duration of life cycle of *C. vicina* was determined based only on diet 1 in five consecutive generations (F2 to F6).

The overall development time from egg to adult stage of *C. vicina* was 16 (384 hours) day. The survival of larval stages for diet 1 and diet 2 was 92.2%±3.7, 68.2%±6.3. Furthermore total survival from egg to adult stage was 74.4%±4.22, 39.6%±4.6 for diet 1 and diet 2 respectively. Our findings about diet 1 indicated that duration from egg to larvae I – II – III, pupae and adult stages were 92%±0.1, 83%±0.1, 1.92%±0.13, 3.17%±0.2 and 9.17%±0.42 respectively.

Results of this research showed significant differences between two diets in mortality rates of larval stages. It is clear that diet 1 is more efficient in the developmental process of all the life cycle stages of *C. vicina*.

# Notes on useful morphological characters of the 3rd larval stages of three species of Sarcophagidae family (Diptera)

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**Key words:** Diptera, Sarcophagidae, Sarcophaga, Iran.

Sarcophagidae family is more important both in medical and forensic entomology. Their exact identification based on morphological characters is difficult and it is possible only with data given by male genitalia. There are a few data about recognizing the flies at the larval stages which is not easy to study. The object of this study was to find some useful characters to distinguish larval stage III of some of Sarcophagidae flies in Tehran.

Samples of Sarcophagidae flies in Tehran city were collected from May to September 2013, using the insect net. Each female sample was placed in separated cups and transported to the laboratory for temporary rearing. Cups have been equipped with fine mesh net on top and fresh beef for larvae laying and rearing. Temporary rearing was done in fly incubator with 50 ± 10% of relative humidity and 25 ± 2 degree centigrade of temperature. Few of the 3rd instar larvae were preserved in the 70% EtOH and the remained larvae continued their growth to the end of cycle. All adults were mounted immediately after emerging. Males were used for species identification, pulling out their genital organs. The obtained larvae were studied carefully and compared with the other species.

There are some differences between perithreme, appendixes on the anal segment and shape of excretory pore in three species, *S. argyrostoma*, *S. aegypyica* and *S. variegata*.

The shape of prithrim in *S. variegata* is completely open in ventral and in *S. argyrostoma* it is closed but in *S. argyrostoma* it is not closed completely. Schematic shape of appendixes of *S. aegyptica* and *S. argyrostoma* has little difference but for this issue these two species are completely different to *S. variegata*.

There are some documents on variations and species description for *S. argyrostoma*, *S. variegata* and *S. aegyptica*. With this study it has been tried to show the exact morphological variations between these species and to compare them with collected samples in Tehran. Finding some local taxonomical changes between the species it is possible they occur all around the world. Therefore it can be recommended that such study should be done for other species and compared to provide applicable identification keys.

# Aspects regarding forensically important Diptera colonization process indoor (Bucharest, Romania)

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**Key words:** experimental model, forensic entomology.

Although forensic entomology is integrated in forensic expertises all over the world, in Romania this investigation technique is not used by police forces in the court of low.

A forensic entomologist is requested to take part in an on-site investigation at the crime scene to collect and analyze necrophagous insect species. After the entomological analysis, a bio-forensic report is elaborated in which all the information who led to the P.M.I. establishment is presented as truthful probation mean and argued in the court of low. Besides this operational function brought to justice, a forensic entomologist develops experimental research with the purpose to create a database in order to be used subsequently as reference mean. This kind of research refers to the assembly of experimental models in different conditions like open air, buried, submersed, indoor.

In our study we investigated the colonization process of forensically important Diptera species indoor. This research was developed between 4 and 30 July 2009, in an eight floor building on a balcony, urban area. As baits were used pieces of pig meat placed in jars and the balcony window was left half-open. Sarcophagidae and Calliphoridae species were observed, females were allowed to oviposit then moved in separate jars covered with gauze. The development cycle of each species has been monitored and all the meat before consumption has been weighed. Temperature and relative humidity were registered.

In conclusion, even indoor, in an apartment, if there is a space by which insects can penetrate the body colonization can occur, also at increased temperature the process of decomposition is accelerated.

Such experimental research have been developed so far in other countries, but our goal was to test this in Romania, and to see what species of insects can enter the apartment, and what quantity of meat can be consumed in the allotted time, not at least to highlight the importance of forensic entomology research in Romania.

# The integument of *Trachelipus troglobius* - evolutionary adaptations linked to the cave environment

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**Key words:** *Trachelipus troglobius*, integument structures, SEM, evolutionary adaptations.

Different specific evolutionary adaptations are known in terrestrial invertebrates inhabiting permanently the subterranean environment. Beside the other modifications, the morphological structures of the integument of cave dwelling isopods represent an example of such adaptations. The micro-scales and other corresponding structures of the integument have generally a significant role in maintaining the integrity and the normal functioning of the isopods cuticle by preventing small particles of sediment from sticking to the cuticle.

*Trachelipus troglobius* is one of three terrestrial isopod species (Isopoda, Oniscidea) described from the Movile Cave, one of the most important and unique hygrothermal cave systems. Detailed investigation of the cuticle structures has been undertaken using scanning electron microscopy in order to elucidate to which extent the cave environment evolutionary influenced the morphological structures of the body integument of this species.

The integument ornamentation of *Trachelipus troglobius* has a uniform aspect. The cephalon, the pereion and the pleon are covered by flattened scales and half-moon pits. There are several smooth areas lacking either scales or pits while other areas are almost completely covered by scales. There is, however, no rule concerning the repartition of the scale and pits on the body surface and their presence is, most probably, influenced by the frequency or the intensity of the contact between the body surface and the cave sediment or walls.

Tricorns, characteristic for body surfaces of some isopod species, were not found. Nevertheless the other integument structures present a clear protection role. The water conservation function may be evolutionarily reduced or absent as the species permanently inhabits the highly humid cave environment.

# Preliminary taphonomical analysis of the megafaunal assemblage from the Pleistocene of Copăceni (Ilfov County, Romania)

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**Key words:** taphonomy, Quaternary, large mammals.

Recent investigation of the "Copăceni beds" (Andreescu et al., 2013), which crop out along the banks of Argeş River at Copăceni (Ilfov County), led to the discovery of a fairly rich and diverse faunal assemblage that includes both small (rodents, insectivores) and large (bovids, rhinocerotids, cervids, elephantids) mammals (Ştiucă et al., 2013; Vasile et al., 2013), suggesting that this stratigraphical unit of uncertain status accumulated during the middle-to-late Early Pleistocene, and possibly also during the early Middle Pleistocene.

A total of 78 skeletal parts belonging to large herbivores have been found so far, and are well enough preserved to allow the assessement of their anatomical position. Only six specimens could not be assigned to any of the four families mentioned above. A minimum number of 11 individuals was deduced on the basis of the anatomical position of the remaining specimens. In order to evaluate the impact of fluvial transport on the fossil assemblage (its autochtonous or allochtonous nature), the 78 skeletal parts were assigned to three groups of susceptibility to hydraulic transport, according to the procedure introduced by Voorhies (1969).

All three Voorhies Groups are well represented (only those of Group I being slightly more numerous than the others), suggesting that the fossil assemblage was not significantly affected by hydraulical sorting, and hence represents a parautochtonous accumulation. This conclusion is also supported by the discovery of partially articulated elements (cervid vertebrae, bovid metapodia), suggesting that sedimentation conditions did not involve strong currents that would have separated them.

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# The diversity of Pleistocene proboscideans from the Rateș fossil site (Galați County, Romania) – biostratigraphical importance

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**Key words:** Quaternary, Elephantidae, taphonomy.

The Rateș fossil site is found on the left bank of Bârlad River, at about one kilometre downstream from the city of Tecuci (Galați County). The continental deposits cropping out in this area were assigned to the Quaternary period, based on the rich and diverse vertebrate fauna. The best represented vertebrates remains reported from Rateș belong to the elephantid proboscideans. Most of the proboscidean remains were assigned to *Mammuthus primigenius*, suggesting that the containing deposits accumulated during the Late Pleistocene; rare fragments assigned to *M. meridionalis* were considered reworked from older deposits (Apostol & Vicoveanu, 1970).

A taxonomical revision of the elephantid specimens housed in the vertebrate collection of the Tecuci Mixed Museum employing morphometrical methodologies (Maglio, 1973; van Essen, 2011) unavailable at the time of previous studies. The present study revealed that the dentognathic elements actually belong to three species of the genus *Mammuthus*: *M. meridionalis, M. trogontherii* and *M. primigenius*.

The three species of the genus *Mammuthus* mentioned above are part of monophyletic lineage, evolving from the basal to the more derived form during the entire timespan of the Pleistocene: the latest Pliocene – Early Pleistocene *M. meridionalis*, was followed by the Middle Pleistocene *M. trogontherii*, and the Late Pleistocene – Early Holocene *M. primigenius* (Lister et al., 2005).

Although the low number of *M. meridionalis* specimens can still suggest they were reworked from older deposits, the abundant and well-preserved fragments of *M. trogontherii* and *M. primigenius* indicate that Middle and Upper Pleistocene deposits are present at the Rateș fossil site.

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# Natura 2000 marine habitats at the Romanian Black Sea coast

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**Key words:** marine habitats, Natura 2000, Black Sea coast, biodiversity.

In order to evaluate habitat diversity values in biodiversity assessments and to identify the character and distribution of the marine and shore line habitats included in the Natura 2000 network, a synthesis of the data on biodiversity of marine habitats of the Romanian Black Sea coast was achieved. For each Natura 2000 habitat, the characteristic species and the components of the benthic, plankton and nectonic associations have been identified. Brief overview of each habitat are presented as the position of habitats along the coastline.

For a better location of each habitat, the coastline was divided into sectors, from the mouths of the Danube and ending with the Vama Veche - May 2 area. For each terrestrial Natura 2000 habitat the main plant associations, the characteristic species and the invasive ones are presented. For the fauna, there are presented the main invertebrate species, amphibians, birds and mammals. For the aquatic habitats – marine and freshwater – there are presented data about the benthic communities, including invertebrate and algae, plankton, fish and marine birds. Data on the conservation status of the Natura 2000 habitats, impacts and evolution trend are also presented.

Based on the structure of marine and shore line habitats, a database was developed for the entire length of the Romanian seaside. This database will be a useful tool for analysing the evolution of habitats in the seaside of the Black Sea and for the risk assessment.

The database was achieved within a research project supported by a grant of the Romanian Ministry of National Education, PN-II-PT-PCCA-2011-3.2-1427 contract nr.69/2012 (project acronym: ECOMAGIS).

# Re-emergence and surveillance of vector-borne diseases

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**Key words:** re-emerging vector-borne diseases, environmental changes, ecological surveillance.

Re-emergence of vector borne-diseases is a global process of major importance that appeared in the last years because of the climatic and other environmental changes generated especially by the human activities. The environmental changes influence by increasing of the distribution and abundance of vector populations and the contact of humans with vectors.

The circulation of West Nile virus is endemic in Romania, increased in the last years, and infections with this virus transmitted by mosquitoes on large territories appear continuously as sporadic cases and occasionally severe outbreaks. Malaria represented an ancient scourge of Romania and there is a permanent risk of its re-appearance because of the simultaneous presence of the abundant local populations of anopheline vectors caused by the environmental changes and the imported malaria cases. The Lyme borreliosis and tick-borne encephalitis are the most important tick-borne diseases present in Romania and they have shown significant recent increase in incidence, at least partly due to changes in human behaviour in relation to the environment as in the rest of Europe.

There is the need of the prevention and control of these vector-borne diseases representing important problems of public health.

The surveillance of these diseases is different from that of other infectious diseases because the main element in their appearance and epidemiology is the vector under the direct influence of environmental conditions. The ecological surveillance is the essential activity for the prevention and removal of these diseases and it focuses on the understanding the ecological factors of the transmission of the pathogen by its vectors and interruption of the transmission cycles by permanent monitoring and control of vectors in natural and anthropic ecosystems and habitats.

The evaluation of environmental conditions by spatial technologies (remote sensing by satellites and GIS techniques) are innovative tools for epidemiological monitoring and control of vector-borne diseases.

# An ecological assessment of biodiversity of the Thar Desert (Rajasthan, India)

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**Key words:** Thar Desert, vertebrate diversity, ecological changes, canal irrigation, socio-economic changes, anthropogenic activities.

The Thar Desert is one of the smallest deserts in the world, but it exhibits a wide variety of habitats and biodiversity. The eastern extremity of great Palaearctic desert is one of the most populated deserts of the world. More than 66 species of mammals, 375 species of birds, 44 species of reptiles and eight species of amphibians make this small geographic area a diversity rich region. The Thar is under the process of ecological transformation and important reasons behind the transformation are irrigation brought by Indira Gandhi Canal (IGC), Global Climatic Change and anthropogenic activities. Irrigation from IGC started in 1961 with an aim to improve the economic, social and environmental conditions of the region. I had been monitoring the canal command area since last 20 years and assessing the ecological changes brought about by canal irrigation. The socio-economic changes brought about by canal irrigation had been more or less positive, the ecological changes had mainly been negative. As a consequence of seepage from canal, the problem of water-logging has crept in. Due to flood irrigation and water-logging, soil salinity is increasing. As a result of easily available water, water-borne diseases are increasing. Gastroenteritis, hepatitis A & B, typhoid and dysentery are on rampant. Cerebral malaria, which was never heard from this "no disease zone", spreads every year in epidemic form. Small mammalian fauna of the region is changing and plague-bacillus reservoir and plague-bacillus susceptible species are occupying same niche. Desert-adapted wild animals are disappearing from the region and many aquatic species are invading the region. As many as 24 species of birds, which were reported by two English naturalists in the first decade of the 20$^{th}$ century, had disappeared from the region. More aggressive mesic species of mammals are extending their range into the Thar and shy desert-adapted species are being pushed out.

# Extrinsic factors controlling the rotifer communities in semi-anthropized deltaic systems

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**Key words:** extrinsic factors, rotifers, semi-antropized ecosystems, Danube Delta.

The rotifer communities have a scientific interest because of their significant role in aquatic ecosystems. Their diversity and abundance represent important components in the flow of matter and energy in the trophic food web. The rotifers are strongly influenced by the ability to interact with the environment, tolerance to certain physical-chemical parameters that determine the degree of population development. The spatial and temporal variability can be considered one of mechanisms of the rotifer response to natural or anthropogenic changes. These communities have been used to characterize ecosystems with varying degrees of human pressure because have an adequate generation time to incorporate the impact effects. In order to investigate the influence of environment on ecological parameters of the rotifers in the Sfântu Gheorghe branch, in the 2008 - 2010 interval (ecosystem subjected of hydraulic works), it were conducted statistical and mathematical correlations. The temporal dynamics and distribution of rotifer populations was done in close relation to variations of the extrinsic control factors. Studies have shown the existence of multiple interactions between physico-chemical factors, biotic and rotifer populations. Overall, they were responsible for the structuring of the communities, influencing both the spatial distribution and temporal dynamics. Temperature ($R^2 = 0.083$, $p = 0.02$, oxygen concentration ($R^2 = 0.064$, $p = 0.046$), the availability of nutrients (especially nitrogen forms, $R^2 = 0.11$, $p = 0.01$) and phytoplankton primary production ($R^2 = 0.079$, $p < 0.05$) were the most important factors influencing the development of rotifers.

# Ecology notes and distribution modeling of the endemic scorpion species *Euscorpius carpathicus* (L.) (Scorpiones: Euscorpiidae): a multiscale analysis

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**Key words:** Carpathian Scorpion, Europe, habitat selection, potential distribution, ecology overwintering, temperate region.

This is the first note on the ecology of *Euscorpius carpathicus* (Linnaeus), a species of scorpion endemic to South Romania, and the first data on the overwintering habitat selection of a species of *Euscorpius*. In modelling the potential distribution of the Carpathian Scorpion in Romania we used literature and personal records (obtained during 2008 to 2012), in correlation with climatic data (Hijmans et al., 2005) and compiled them using MaxEnt (Phillips et al., 2006; Phillips & Dudik, 2008) and ArcGIS. The model obtained was evaluated using: classical AUC calculated by Maxent (Phillips et al., 2006; Phillips & Dudik, 2008), partial AUC (Peterson et al., 2008) calculated using partial ROC software and omission error.

The ecology notes refer to microhabitat selection and overwintering site selection of the Carpathian Scorpion in the Curvature Sub-Carpathians. Three types of habitats from the studied area were used: forests, meadows and riparian habitats. We used First Sight Point (FSP) methodology in counting the habitat characteristics which act as variables used in generating our models. To evaluate the different hypotheses which explain the overwintering habitat selection by the Carpathian Scorpion we used an information-theoretic approach (Anderson & Burnham, 2002; Mazerolle, 2006). Subsequently, we selected three of the computed models using AIC (Akaike Information Criteria).

Our results show that the overwintering strategy of *E. carpathicus* in the area of Curvature Carpathians foothills involves microhabitat selection with absolute preference for riverine clay banks.

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# A comparative study on the ecology of two *Nesticus* (Araneae: Nesticidae) species

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**Key words:** *Nesticus cernensis*, *Nesticus ionescui*, spider ecology, Southern Carpathians, speciation.

Within European boundaries, Southern Carpathians are a cradle of speciation for the spiders belonging to Nesticidae family. From 21 already described species (Platnick, 2013) excepting *Nesticus cellulanus* (Clerck, 1757) the rest of *Nesticus* and *Carpathonesticus* species are endemic to the region and in general each species is restricted to a certain mountain range.

The species similarities in their general appearance and genital morphology suggest that speciation within family was induced by geographic isolation of different populations within karst systems. We wanted to test if this geographical isolation is backed up by different ecological requirements of these species. Our investigations focused on two species: *Nesticus cernensis* Dumitrescu, 1979, and *Nesticus ionescui* Dumitrescu, 1979. These species were selected because *N. ionescui* has the largest habitat out of all the endemic Nesticids, while *N. cernensis* is only found in the Southern part of the Cerna Valley.

We found that both species although now live in mountains and caves can survive to temperatures of up to 32°C with the condition that air humidity is 100%. The humidity plays a key role and their isolation seems to have been forced by the climatic changes that started at the end of Paleogene and involved not only lower temperatures but mainly a dryer atmosphere.

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# Factors influencing habitat use by harvestmen (Opiliones) in Mehedinți Plateau Geopark (Romania)

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**Key words:** habitat use, harvestmen, Mehedinți Plateau Geopark.

Human activities are contributing to habitat changes that may negatively affect harvestmen species. Harvestmen are sensitive to habitat changes and to human activities, such as: use of fertilizers and pesticides, pollution, and forest inadequate management practices. We study the habitat use by harvestmen in Mehedinți Plateau Geopark (MPG) karst area. The presence/absence of the harvestmen species was investigated in 2012 in 30 sampling sites. For each sampling site the following environmental variables were recorded: habitat type, presence of water bodies in the adjacent area, and altitude. 15 species were identified, the most common being *Egaenus convexus, Lacinius horridus, Dicranolasma scabrum, Trogulus oltenicus, T. closanicus* and *Paranemastoma silli*. The number of species per site varied between 0 and 5. The highest number of species was found in the beach forest. Occurrence models showed that the presence of water bodies in the adjacent area was the main predictor of the habitat use by *Egaenus convexus, Lacinius horridus* and *Dicranolasma scabrum*. Habitat type was the most influential variable of *T. oltenicus* occurrence. These suggest that humidity is an important limiting factor of harvestmen distribution in MPG karst area.

# Comparative fecundity of coexisting amphipod species (Crustacea: Amphipoda) in western Romania. Could distant evolutionary relationships promote coexistence?

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**Key words:** fecundity, coexistence, native species, Gammaridae, Niphargidae, Crangonyctidae.

An assemblage of 3 sympatric amphipod species (*Gammarus balcanicus dacicus*, *Niphargus valachicus* and *Synurella ambulans*) belonging to 3 different families is present throughout the lowlands of Romania and in some instances these species are found to coexist. Native freshwater amphipods are seldom observed cohabiting because they usually exhibit high levels of intraguild predation. In this respect, the lowlands in Romania are good natural laboratories to study the interaction between native amphipod species. Fecundity studies of coexisting amphipods have been carried out mostly on native vs. invasive species and not too much is known about this trait in native amphipod communities. We expect significant differences between the fecundity of these species based on their distant evolutionary relationships. We analyzed female body length and number of eggs per brood in order to determine the fecundity of these species and to reveal some insight into their mechanism of coexistence. The most fecund species is *S. ambulans*, followed by *N. valachicus* and *G. dacicus*. Among these species, *N. valachicus* is the most precocious, reaching maturity at a relatively small size. *S. ambulans* has one of the highest fecundity among native freshwater amphipod species studied thus far and *N. valvachicus* has one of the lowest maturity index. Differences in mean brood size and mean breeding female size between species are statistically significant, confirming our hypothesis. We further propose that this difference in fecundity is one of the possible mechanisms that promote coexistence among these native species.

# Study on seasonal fluctuation of population and various control methods of cherry fruit fly, *Rhagoletis cerasi* (L.) (Diptera: Tephritidae) in Sahneh orchards (Kermanshah, Iran)

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**Key words:** yellow card, attractive ammonium acetate, integrated pest management, Dichlorvos.

Seasonal fluctuations in populations of cherry fruit fly *Rhagoletis cerasi* (L.), various methods to control and effective use of time for each of the cherry orchards in Sahneh vicinity, Kermanshah province were investigated for this purpose in May 2009-2010. Yellow card visual traps with ammonium acetate attractant were mounted in the canopy at 1.5-2 m high and top of trees, the flies being counted every day. In addition, some treatments of plowing and yellow traps with pesticides (Dichlorvos) were evaluated. The results showed that the emergences of adult flies were dependent on the daily air temperature and soil humidity in two consecutive years. So, the first year adult flies were caught by traps on 25 May, but in the second year, on 19 May. The high predation was related to treatments in which more cards or attractive traps were used in association with plowing and pesticide spraying on a stage with 6-3 cards/tree (depending on the type of different varieties of cherry in the garden) was almost equal value plowing efficiency with installation of the 2-3 cards loss reduction in was almost equal. Next year, the decreasing of pest was due to the simultaneous treatment with attractive traps and chemical substances. Finally, defining number of card for effective control of pests in the garden cards depends on age and extent of tree canopy and pest population density.

# A survey on urban ants (Hymenoptera: Formicidae) – Case study: Sibiu city (Transylvania, Romania)

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**Key words:** ants, urban ecosystems, Sibiu.

Urbanization causes the fragmentation of natural habitats into isolated patches surrounded by anthropogenic habitats. Urban ecosystems display a fragmented landscape where green spaces are surrounded by human settlements, industrial development, roads, and sidewalks. These urban characteristics may reduce the dispersal efficiency of many species including ground-dwelling arthropods (Niemelä et al., 2000). Ants can tolerate unfavourable environmental *conditions*, including urban habitats.

Pitfall trapping and baiting observations were carried out in 2007 and 2012 in different urban habitats: greens spaces, forests, disturbed areas (old-fields, industrial areas). Additional data provided by literature was compiled to our survey. Altogether, we identified 20 ant species belonging to 2 subfamilies. Species richness is low considering that a recent study on the myrmecofauna of Sibiu County resulted in 70 ant species (Tăușan et al., 2012). As expected the majority of species are ubiquitous (*Lasius niger, L. paralienus, F. cunicularia, F. cinerea* and *Tetramorium* cf. *caespitum*). However, the presence of *Monomorium pharanonis*, an invasive ant species is worth mentioning. The forest close to the city provided habitat for several ant species: *Myrmica ruginodis, Stenamma debile, Lasius brunneus, Myrmecina graminicola* and *Temnothorax crassispinus.* Distribution maps of the ant species are given.

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# Ants (Hymenoptera: Formicidae) in disturbed urban habitats. Case study: Sibiu city (Transylvania, Romania)

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**Key words:** ants, food preferences, community composition, disturbed areas, Sibiu.

Ants are a group of thousands species (more than 12.000) distributed all over the globe. Disturbed areas are characterized by low diversity and by the presence of ubiquistic species. Ant communities can tolerate highly disturbed areas.

Sampling was carried out in different disturbed habitats from Sibiu in July 2012. Four sites (and one additional control site) were investigated.

Baiting observations were used to investigate ant communities in terms of: species composition, food preferences and interactions. For each site we used three types of artificial baits: honey (source of carbohydrates), tuna (protein source) and mixed (tuna and honey, 1: 1). 15 observation points were placed alongside a transect in each site. We identified 9 ant species belonging to 2 subfamilies: *Formica cinerea, F. cunicularia, F. fusca, F. rufibarbis, Lasius niger, L. platythorax, Myrmica ruginodis, M. scabrinodis* and *Tetramorium* cf. *caespitum*. Our results reveal that ant activity was high in all sites and despite disturbance we recorded food preferences among ant species. Specifically, *F. cunicularia* preferred the protein baits, whereas *Myrmica* species preferred the carbohydrates source. As expected most species were present on the mixed baits: *F. cinerea, F. fusca, L. platythorax* and *Tetramorium* cf. *caespitum.*

# Forest-grassland ecotone: insights from the ant fauna (Hymenoptera: Formicidae)

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**Key words:** ants, ecotone, community structure, grassland, forest, Transylvania.

An ecotone is a transitional zone between two or more different types of ecological communities. Insects play central roles in ecosystem functioning. In this context, insects are valuable ecological indicators of ecotones. Among insects, ants are considered terrestrial ecosystem engineers.

We studied the effects of ecotone on ants' diversity, dynamics and community composition in Cisnădioara (Southern Transylvania). Three habitats were investigates: grassland, deciduous forest and the ecotone formed by the previous habitats. Pitfall traps were installed in three seasons (May, July and September) in 2012. One transect consisting of 15 pitfall traps was placed in each habitat. We identified 21 ant species belonging to 2 subfamilies. 18 species were present in the ecotone whereas 8 ant species in the grassland and forest habitats. As expected, the habitats were significantly different in terms of species composition. The species richness and community composition varied significantly along the grassland-forest gradient, thus these three habitats present communities more or less specific.

Based on our results, the ecotone was characterized by specific myrmecofauna: *Camponotus ligniperdus*, *C. vagus*, *Formica fusca*, *F. pratensis*, *Myrmica schencki* and *Plagiolepis pygmaea.*

# Ant communities (Hymenoptera: Formicidae) from urban green spaces. Case study: Sibiu city (Transylvania, Romania)

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**Key words:** ants, artificial baits, community composition, food preferences, urban ecosystems.

Anthropogenic transformation of a territorial system, regardless of its size, indicates the action to change the appearance, form and content of the system. Currently Sibiu's landscape is characterized by fragmentation of green areas – a mosaic generated by both natural and anthropogenic influences. Ants are known to occur in all types of terrestrial habitats, including urban ecosystems. We investigated ant communities in terms of diversity, food preferences and interspecific interactions.

The study was carried out in July 2012, in four urban green spaces and one control site. Observations based on artificial baits were used to analyze the ant community structure from green areas. Three types of baits were used: honey (carbohydrates source), tuna (protein source) and mixed (tuna: honey, 1: 1). We identified 9 ant species: *Formica cunicularia*, *Lasius niger*, *L. paralienus*, *L. platythorax*, *L. brunneus*, *Myrmica rubra*, *M. ruginodis*, *M. scabrinodis* and *Tetramorium* cf. *caespitum*. Most of the species are common and ubiquistic.

Our results show significant differences among sites in terms of ant community composition. The small patchy green areas yielded a low number of species (mainly ubiquistic), whereas in larger woodlands, typical forest ant species occurred. However, based on our results, the habitat structure plays an important role for ant communities in urban green spaces.

# Histopathological analysis of gills in fish population of reservoir "Tikves" (R. Macedonia)

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**Key words:** gills, histopathology, Tikves.

"Tikves" is one of the largest artificial reservoirs, which has been built with constraining of River Crna near the town of Kavadarci. This reservoir is a hydro energetic and irrigation system that is exploited for sports and economic fishery.

In the accumulation Tikves (a.k.a. Lake Tikves) there are to be found 20 different species of fish, representatives of 7 families.

During the summer period of 2011, in the reservoir Tikves, from the locality Resava Bay, a total of 12 of fish specimens have been caught, which were classified in 6 different species (*Carasius gibelio*, *Rutilus rutilus*, *Ameirus nebulosus*, *Perca fluviatilis*, *Vimba malanops*, *Silurus glans*). Out of each specimen there have been dissected a piece of gills for histological analysis, which, thereafter has been processed on the standard procedure for development of histological preparation. They have been analyzed under a microscope and the registered tissue lesion has been photographed.

Based on standard histopathological analysis some gills lesions were detected. Microscopic analysis has revealed a series of circulatory, regressive and inflammatory changes. The most prominent were necrosis of respiratory epithelium accompanied by collapsed secondary lamellae and infiltration with eosinophiles in respiratory epithelium. Some structural lesions in gill tissue have been accepted as valid biomarkers of anthropogenic stress at fish.

# Phytophagous fish species and their role in aquatic ecosystems of the Republic of Moldova

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**Key words:** fish, phytoplankthon, aquatic ecosystems.

In the early 1960s, as a result of introduction and acclimatization, the diversity of ichthyofauna of Republic of Moldova was filled with phytophagous fish species of Asian origin: Silver carp, *Hypophthalmichthys molitrix* (Valenciennes, 1844), and Grass carp, *Ctenopharyngodon idella* (Valenciennes, 1844). The Asian cyprinids fishes currently occupy 65% of the total production of fish farms. In the natural ecosystems from the country the number of these species depends mostly on the population rate (planned or accidental) and intensity of the extraction through fishing.

After the natural disasters from 2008 and 2010, their abundance in the Dniester and Prut basins has increased significantly. Due to the specific way of nutrition (Silver carp -phytoplanktophagous and Grass carp-macrophytophagous), the Asian cyprinids in optimal quantities are necessary for the functioning of the aquatic ecosystems, serving also, as biological improvers in diminishing the intensity of the eutrophication and silting process. These species transform the trophic base unexplored by other hydrobionts into economically valuable fishery biomass. However, in cases of overcrowding and naturalization possibility, these species can cause an invasive effect, having an accentuated competitive potential and an unexpressed trophic selectivity.

The share of the algal biomass in the fish bowl reaches 46%, the intensity of nutrition with phytoplankton depends on the level of development of some species in its composition. It has been experimentally demonstrated that the influence of silver carp over the phytoplankton determines the intensification of the photosynthesis in the algae biomass unit and has the effect of primary production increasing in the ecosystem in terms of density.

# Contributions to the study of habitat distribution and preferences of marine fish along the western coast of the Black Sea

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**Key words:** fish, Black Sea, habitat distribution and preferences, ichthyofauna diversity.

The main objective of the study is to present the current situation regarding habitat distribution and preferences of marine fish populations along the western coast of the Black Sea. The study was undertaken between 2011 and September 2013 in two major locations: the Constanța area in Romania, including the coast area and the Constanța-Agigea port and the Shabla-Tyulenovo coast in Bulgaria.

A number of 42 fish species of Chondrichthyes and Osteichthyes were identified, belonging to 12 orders and 28 families.

Observations were made using scuba in all the locations and by fishing in the Constanța sector. Observations made while scuba diving were of great importance to this study. The use of this method allowed the determination of the habitat differences; 48% of the species identified in this study were noted only by using this method. These species include: *Sciaena umbra*, *Uranoscopus scaber*, *Salaria pavo*, *Coryphoblennius galerita*, *Callionymus pusillus*, *Aphia minuta*, *Ophidion rochei*, and *Chelidonichthys lucerna.*

The habitats were divided into 5 types: pelagic, sandy bottoms, rocky bottoms, rocky habitats with *Cystoseira* sp. and man-made structures like breakwaters. Vertically, the delimitation was made above and below the 10 meter line due to the differences in temperature, light penetration and surface wave interference.

In the two study areas 34 species were identified in the Shabla-Tyulenovo area, compared to only 29 species in the Constanta area. The main reason for this difference is that regions with *Cystoseira* can only be found in the Bulgarian area, 15 species preferring this kind of habitat. As a characteristic to the Constanța sector, the port area was the only one with breakwaters, this form of habitat housing 19 species.

Overall, 26% of the species preferred the rocky habitat followed by the breakwaters with 23%, sandy bottoms with 23%, 18% *Cystoseira* sp. fields and 10% pelagic. Regarding vertical distribution 73% of the species can be found in the 0-10 meter segment.

# Morphological variability of Prussian carp *Carassius gibelio* (Bloch, 1782) across Vojvodina Province, Serbia

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**Key words:** morphological variability, linear morphometry.

Prussian carp *Carassius gibelio* (Bloch, 1782) is an invasive fish species in Serbia, but also accross entire Europe. It has been introduced to Europe from Asia, and it became a very dominant fish species in many ecosystems. It is considered that this species is currently in naturalization phase. The aim of this study was to assess morphological variability of this fish species across the Vojvodina Province, Serbia. Ichthyological material was collected during May, June, July and August 2013 at the Danube-Tisa-Danube channel, Apatinski rit, Begecka Jama, Kraljevac and Palić sites with gillnets of various mesh sizes and standard electrofishing device. Samples were transferred to the laboratory on ice. Every individual was photographed using Canon IXUS 117HS digital camera. A total of 17 measurements were measured (± 1 mm) in ImageJ image processing software. All measurements were allometrically transformed to remove size-dependent variation in morphometric characters. Significance of differences in measurements between sites was assessed by One-way ANOVA followed by Tukey post-hoc test. Discriminant canonical analysis (DCA) was conducted to determine contribution of each measurement in morphological variability. Tukey post-hoc test displayed various levels of differences between sites in all measurements. DCA provided four roots in explaining variability across sites. Only two roots were taken into account since only they had an eigenvalue above 1 and have explained a total of 82.11% of morphological variability. Root 1 vs root 2 plots displayed three clear groups. First group was comprised of individuals from Apatinski rit and Begecka jama sites, the second group was comprised of individuals from Kraljevac and Danube-Tisa-Danube channel while the third group was comprised of individuals from the Palić lake. Snout to pectoral fin length, postorbital length and maximal body height contributed the most to morphological variation.

# Growth of Prussian carp *Carassius gibelio* (Bloch, 1782) from the Stari Begej site, Vojvodina, Serbia

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**Key words:** Prussian carp, growth model, sexual size dimorphism.

Prussian carp *Carassius gibelio* (Bloch, 1782) is known as a very invasive fish species. During the course of past 30 years it became dominant in aquatic ecosystems across Serbia and exerted negative effects on the indigenous ichthyofauna. Given that this fish species was the most dominant in the ichthyofauna of the Stari Begej site, the aim of this study was to assess its growth through multi-model analysis. Ichthyological material was collected at the Stari Begej site during July and October 2007 and July and October 2008 with gillnets of various mesh sizes and standard electrofishing device. Immediately after capture, every individual was weighted for body weight (±1 g) and measured for total length (±1 mm). Age was determined by counting the scale annuli, while sex was determined by macroscopic observation of the gonads. Growth was assessed through three models, Von Bertalanffy growth function $L=L_{\infty}*(1-\exp((-K)*(t-t_o)))$, the Gompertz growth function $L=L_{\infty}*\text{Exp}(-\exp((-K)*(t-t_o)))$ and Robertson's growth function $L=L_{\infty}/(1+\exp((-K)*(t-t_o)))$ where $L_{\infty}$ is the asymptotic length, K the growth coefficient and $t_0$ the theoretical age at which length L=0. Models were fitted for males and females separately. Goodness of fit for the three models was assessed by Akaike's Information Criterion (AIC). Von Bertalanffy growth function had the lowest AIC value in both males (L=23.67*(-0.19*(t+1.12))) and females (L=32.04*(-0.12*(t+1.40)) and was the best fitting model. Likelihood ratio test displayed significant differences in growth between males and females ($\chi^2$=23.831, d.f.=4, $p<0.01$). This study displayed variations in the growth of males and female individuals with females growing to larger sizes, but at a slightly slower rate. This is somewhat to be expected since sexual size dimorphism with females being larger than males is common in fishes.

# Long term monitoring of water bird populations in the Natura 2000 site RO-SPA 0026 Danube water course Baziaș – Iron Gates (Romania)

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**Key words:** water bird, Natura 2000, RO-SPA 0026 Danube water course Baziaş – Iron Gates, Romania.

The study was conducted between 2011 and 2013 and was a part of activities within LIFE10 NAT/RO/000740 Project "Improving the conservation status for the priority species and habitats in the Iron Gates wetlands".

The objective was monitoring of the priority bird species status in seven sites selected for this purpose. The selection was performed in order to cover all major wetland ecosystems in the region which are used by large population of different water bird species. Particular environmental conditions of the Danube stream in this area provides optimum feeding support for a significant number of migrant water bird species.

Selected areas were located along the Danube water course between Baziaş and Iron Gates dam, covering the following localities: Baziaș-Nera, Calinovăț Islet, Divici-Pojejena, Coronini-Moldova Veche Islet, Măceşti, Liubcova, and Orşova Gulf, all of them being characterized by large surface of shallow waters with easy accessibility to trophic resources.

Monthly observations were made in all ecological seasons, focusing on pre-breeding and post-breeding seasons which seem to be with highest species richness. Special attention was paid to the dynamics of large flocks of water birds wintering along the Danube River. We recorded over 50 water bird species including loons, geese and ducks, cormorants, herons, waders and other groups.

# Is Tawny Owl (*Strix aluco*) a forest species?

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**Key words:** tawny owl pellets, Transylvania, biomass.

The contents of the Tawny Owl pellets were studied, from 8 Saxon villages from Transylvania (Târnava Mare Valley) (7 evangelic churches and a medieval castle). Most of the species' preys were mammals (22 – 47.8%), followed by birds (16 – 34.8%) and insects (8 – 17.4%). The rodents represented dominant prey, followed by insectivores and bats. Out of the total number of 22 mammal prey species, 6 are forest species, 5 are present in both open and forest habitats and 11 are open habitats species. The number of prey individuals from these three habitat categories shows a similar proportion to the number of species. However, the total quantity of used biomass (6.7 kg for forest habitat mammals, 0.6 kg for the open and forest habitat species, and 44.8 kg for the open habitat species) shows that tawny owl has its main feeding territory within the open habitats. The most frequent species from the total of 899 prey mammal individuals were: Common vole (*Microtus arvalis*), Wood mice species complex (*Apodemus sylvaticus/flavicollis*), Northern Water vole (*Arvicola amphibious*), House mouse (*Mus musculus*), Common dormouse (*Muscardinus avellanarius*) and Field vole (*Microtus agrestis*). The anthropophilic prey species (Brown rat - *Rattus norvegicus* and House mouse - *Mus musculus*) also represent an important part of the Tawny Owl's diet.

# Ethological observations on rooks (*Corvus frugilegus* L.) under natural conditions of rehabilitation

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**Key words:** rookery, juveniles, food, flight, rehabilitation.

In 2013, in the breeding season of the Rook (*Corvus frugilegus* L.), we made observations in rookeries established in two neighbourhoods in Iaşi city, Tătăraşi and Copou. The rookery from Tătăraşi neighbourhood is made up of four subdivisions, three of which are situated in Vasile Lupu Street and the fourth in Ciurchi Street. Two of the subdivisions of the rookery "Tătăraşi" also serve as roosts for Rooks, towards the end of the breeding season. The object of our research has been Rook behaviour at the stage of chick development subsequent of leaving the parental nest. In order to obtain ethological data we captured six individuals that we hand-reared in Tătăraşi neighborhood. Pair-bonding within the nesting place occurs at the beginning of March. During this period the mates join for courtship-display and for mating, the male giving the female regurgitated food. Subsequently the couples start preparing the nest for laying eggs. The laying period differs from one couple to another, depending on the moment the nest building ends and on the female physiology. In the circumstances of 2013, in the rookeries studied by us, the nest building lasted, in some cases, until the beginning of April. The clutch can consist of 2 - 6 eggs. The incubation duration (the embryo development) is 16 - 18 days (Røskaft, 1983). Chick-rearing at the nest lasts from April to June and sometimes, in the case of the couples that lay eggs in May, it reaches July. At the age of 30 - 36 days the chicks are full-fledged and can start the flying activity, in the surroundings of the nest (Perrins & Cramp, 1998). The postembryonic development ends at about 40 days but the parents go on feeding their fledglings for another five to six weeks after leaving the nest (Røskaft & Slagsvold, 1985).

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# Aspects of the small mammal (Mammalia: Insectivora, Rodentia) communities' structure and dynamics in the Danube Delta Biosphere Reservation

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**Key words:** rodents, insectivores, community structure and dynamics, wetland and steppe habitats.

33 species of small mammals (8 insectivores and 25 rodents) are known from the Danube Delta Biosphere Reservation, as a result of habitat heterogeneity and numerous studies carried out in this area.

This study was conducted between July 2007 and August 2013 in four locations and was focused on some aspects of the small mammal communities' structure and dynamics in the floodplains of the Danube Delta (Maliuc locality) and steppe zones of the reservation (Vadu village).

The Danube Delta is an area characterized by high humidity and more or less regular flooding, which becomes a limiting factor for some species. Thus, it results a very characteristic small mammal community, which has developed various mechanisms to survive in these conditions. Several assumptions about them are issued in this paper. During the study period nine field campaigns were made during summer. Eight species were captured and other four were observed. The small mammal community is dominated by *Apodemus agrarius*, favoured by the high humidity due to great extent of water surfaces and repeated flooding of the investigated habitats.

More species are cited in the literature from the steppe area compared to the Danube Delta. At Vadu five field campaigns were carried out during the months of August. The small mammal community from this station is characterized by a very low abundance but high heterogeneity. The specific structure of the community is completely different from the Danube Delta. *Microtus arvalis* is the predominant species and is specific to open habitats. *Mus musculus* was caught in a reedbed on the Sinoe Lake shore, probably reaching here from the nearby garbage deposit. *Apodemus uralensis* was captured on the sand dunes near Vadu beach and *Apodemus sylvaticus* next the reedbed from Sinoe Lake. This last species is the only one captured both at Maliuc and Vadu.

# Some predictable prognosis of number oscillation of *Microtus arvalis* (Rodentia: Cricetidae) in the Republic of Moldova

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**Key words:** *Microtus arvalis*, number, density, dynamics, oscillation, prognosis.

The realization of number development prediction of animal species is of great importance in the fields of animal ecology and biological control of pest species. The rodents represent an excellent model objects for studying the fundamental and applied regularities of animal population ecology and for elaboration of multiannual prognosis regarding their number oscillation. The high reproductive rhythm, the short life span and the susceptibility toward various environmental factors of the rodents determine the intense alternation of generations and number oscillations, and knowledge of these legalities is the foundation of number variations prognosis. These prognoses are very important for developing measures to combat outbreaks of infectious diseases, pest species of agriculture and forestry, etc. The studies conducted in agrocenoses over approximately four decades allow to see that *Microtus arvalis* doesn't show a strict periodicity of population dynamics, while peak phases with the highest density coincide with those from other zones of its spreading area.

The expression of a suitable mathematical form of the functional relationships represents the prognosis model that describes the fluctuation of *M. arvalis* species number. It requires a continuous monitoring of the species in localities, but also in natural and agricultural coenoses. Therefore, a multiple linear regression equation was developed that reflects the correlation between the density of *M. arvalis* individuals, expressed in colonies per hectare and Martonne aridity index, calculated monthly:

$D=-15.67 + 2.8838*Ia,$ where D is the density of individuals and *Ia* is the aridity index.

In the above equation, based on eight possible variants of forecasts from 30 to 30 years of oscillation of temperature and of precipitation till 2099 period, we modeled the eight expected prediction for density fluctuation of *M. arvalis* individuals. In five variants there is a decrease in the density of *M. arvalis* individuals to 2099, and in three of them - an insignificant increase. This is explained by the fact that the content of substances from herbaceous plants absolutely necessary for the development and reproduction of the studied species will gradually decrease because of climate aridisation.

# The importance of wild and domestic ungulates in wolf diet in North Apennine, Italy

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**Key words:** *Canis lupus*, diet, wild ungulates, livestock.

Wolf diet was studied in two distinct packs in a mountainous area of Massa-Carrara province, Tuscany Region. Wolf packs inhabited in two sites, Logarghena (LG) and Zeri (ZR), characterized by different prey species abundances.

A sample of 256 wolf scats were collected from May 2012 and April 2013 (LG site: n=134; ZR site: 122). To assess wolf diet, we analysed biomass percentage (%Bio) using Weaver linear regression (Weaver, 1993). Prey preference was evaluated using Manly's α index of preference (Manly et al., 1972). Wolf diet was analysed both annually and seasonally (summer: May–October, winter: November–April).

On annual scale, wild boar (66.2%) represented the first prey specie consumed by LG's wolf pack, followed by roe deer (22.4%). On the contrary, livestock (46.3%) and wild boar (38.8%) were comparable and represented the most important food items in ZR's wolf pack.

On seasonal scale, wild boar represented the mainly prey consumed by both wolf packs during winter (61.9% $_{\text{LG's wolf pack}}$; 47.4% $_{\text{ZR's wolf pack}}$), while in summer, it was still the mainly prey only for LG's wolf pack (72.0%), because for ZR's wolf pack was livestock (46.6%).

The presence of livestock on pastures influenced strongly the wolf diet, but despite of the major density of it, wolf packs positively selected wild boar in both seasons (LG's wolf pack: $\alpha_{winter} = 0.64$; $\alpha_{summer} = 0.75$; ZR's wolf pack $\alpha_{winter} = 0.65$; $\alpha_{summer} = 0.63$).

This study confirmed the flexibility and the opportunism of wolf foraging behaviour. Wolf tend to focus on those prey species which they find to be most vulnerable and can be killed most efficiently, regardless of their relative abundance in the available community.

In our study wild boar represented the most predicable and profitable species however, also livestock was, because of its high accessibility due to the absence of protective and preventive measure.

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# Invasive species in Tomis Harbour (Constanța, Romania)

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**Key words:** marine invasive species, Tomis Harbour, Romania.

Tomis port is the second port of Constanța, mainly used for mooring sailboats and fishing vessels of shallow draft. The current port Tomis developed after the Second World War, protection dams being built in order to protect the buildings from the cliff. The former bottom of the actual port was represented by submerged rocks covered with the same type of benthic associations dominated by mussels that are found today on the coastline south of the port of Constanța. Building a specific infrastructure in recent years, an increasing number of yachts visiting the port during the hot season has been allowed.

The present study is carried out in continuation of a similar study developed few years ago within the port of Constanța and the fouling monitoring aimed to highlight the presence of marine invasive species. Tomis port that is located close to Constanța port and naval traffic in the area makes the risk of acclimatization of invasive alien species to be relatively high. For the monitoring of the benthic invertebrate communities from fouling, samples were taken each month.

Samples were taken from the port quays, selecting three locations at the entrance, in the middle and the inner part of the harbour, fouling being detached by scraping from a surface of 30 x 20 cm, with a special tool, from a depth of about 1.5 m. Samples were weighed and various size classes of mussels – *Mytilus galloprovincialis* and *Brachyodontes lineatus* - were identified. The invertebrates from each sample were identified and counted, in order to determine the structure of fouling associations in each location. Special attention was given to invasive species currently present in fouling. The preliminary results of the study reveal the presence in the fouling of invasive species like *Rapana venosa* (Gasteropoda), *Corambe* (*Doridella*) *obscura* (Gasteropoda), *Ficopomatus enigmaticus* (Polychaeta), *Balanus improvisus* (Cirripedia), *Rhitropanopeus harrisii* (Decapoda).

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# Population genetics of *Anadara kagoshimensis* (Tokunaga, 1906) (Mollusca: Bivalvia) in Europe

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**Key words:** microsatellite markers, geographic scale, genetic variability, genetic diversity.

*Anadara kagoshimensis* (Tokunaga, 1906) is an Indo-Pacific species considered invasive in Europe. *A. kagoshimensis* was mentioned for the first time as *A. inaequivalvis* (Bruguière, 1789) in the Adriatic Sea, in the 1960s, and in the Black Sea, in 1983.

In this study we used highly polymorphic microsatellite DNA markers to assess the genetic variability of populations from this species. The results were analyzed at two geographic scales: a small one (between two populations at the Romanian Black Sea coast) and a larger one (between the Black and the Adriatic Sea populations).

The variability between the Black and Adriatic Sea samples was moderate, as revealed by the level of genetic diversity (Jost Dest=0.3). All three populations exhibited a moderate level of inbreeding, as measured by the inbreeding index $F_{IS}$ (0.158-0.251), and a significant deficit of heterozygotes, which was also observed in other marine bivalve species. No gene flow was observed between the populations from the Black and Adriatic Seas. This result supports the theory that the two colonization events happened independently.

Considering the fact that *A. kagoshimensis* presents a pelagic stage during its life cycle, we expected the genetic structuring of the Black Sea populations to be influenced by the coastal currents. We therefore tested for the presence of a bi-directional gene flow between these two populations. The results were unexpected as the recent immigration rates estimated using a Bayesian approach identified a significantly higher gene flow from South to North along the western Black Sea coast, which is opposed to the main coastal current. This reversal, as previously reported in some regions of the Romanian Black Sea coast, may be explained by the change in wind speed/direction or by the variation in the discharge of the Danube into the Black Sea.

# Molecular confirmation of *Anadara kagoshimensis* (Tokunaga, 1906) (Mollusca: Bivalvia) in the Adriatic and the Black Seas

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**Key words:** *Anadara kagoshimensis, A. inequivalvis*, ITS1, molecular identification, DNA marker.

*Anadara kagoshimensis* (Tokunaga, 1906) and *A. inaequivalvis* (Bruguiere, 1789) are two very similar arcid species originating from the western part of the Indo-Pacific region. Until 2010, *A. kagoshimensis* has been misidentified in the Mediterranean and the Black Seas under the name of *Scapharca cornea* and *S. inaequivalvis* as an alien invasive species. In the Adriatic Sea, it was observed since the 1960s and was reported as *S. cornea* (Reeve, 1844) by Ghisotti in 1973, while in the Black Sea, the species was first recorded in 1984 by Gomoiu as *S. inaequivalvis*.

In 2006, Lutaenko noticed important morphological differences between *A. inaequivalvis* specimens from the native area (India and Philippines) and the specimens of *A.* cf. *inaequivalvis* from the Black and the Adriatic Seas. Huber (2010) determined that *Anadara kagoshimensis* (Tokunaga, 1906) is the valid name for the invasive ark clam species present in Europe. The author concluded that there are no marked differences in shape, ligament, inequivalvity, number of ribs, rib sculpture and even color between studied specimens from Japan (the native area of *A. kagoshimensis*) and European specimens. It is presumed thus, that the European *A.* cf. *inaequivalvis* has been introduced from ballast water from Japan.

In this study we used a molecular approach to confirm the presence of *A. kagoshimensis* in Europe. We analyzed the nuclear DNA marker ITS1 (internal transcribed spacer 1) in specimens from both the Black and the Adriatic Seas and we compared them with sequences of *A. kagoshimensis* from the Pacific Ocean available from GenBank. We obtained an identity of 98-99% between the sequences of the European specimens and those from the native area. The high percentage similarity between the sequences confirms the presence of *A. kagoshimensis* in the two European seas.

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# Alien weevil species (Coleoptera: Curculionoidea) in the Republic of Moldova

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**Key words:** alien, species, Curculionoidea, Republic of Moldova.

The spreading of species beyond their natural range is stridently rising, due to increased trade between different regions on Earth, transport, travel, tourism and accessibility of goods resulting from globalization. Species, also, present a natural tendency to enlarge their native area, this process being determined by the exploiting of new trophic resources, evasion of intra- and interspecific competition, orientation to areas with the optimum climate conditions, escape of predators, parasites and pathogens. To areas where they break into, these species are considered "aliens".

There is no up-to-date, a comprehensive database of alien insects that have been established in the Republic of Moldova. Available data for certain taxa or groups of insects do not always contain information on the origin of species. Thus, a list of Curculionoidae beetles considered to be of alien origin in the Republic of Moldova has been set up. The greatest number of identified alien weevil species (31) belongs to Curculionidae family, followed by Brentidae (9) and Dryophthoridae (2). Largest proportion of species of alien origin is in Dryophthoridae (40 %) and Brentidae (10 %), while for Curculionidae it represents 6.07 percents. The greatest number of alien weevils originated in Asia and the Mediterranean, some of the species are of unclear origin due to contradictions in the literature. More than half of these species have no (or unknown) economic or ecological negative impact, only a few species are known to cause serious damages in the Republic of Moldova, usually as stored product pests, on agricultural crops or ornamental plants. Among the most known examples there are the rice weevil *Sitophilus oryzae*, the ash seed weevil *Lignyodes bischoffi* and hollyhock weevil *Rhopalapion longirostre*.

# The presence of the Mediterranean fruit fly *Ceratitis capitata* (Wiedemann) (Diptera: Tephritidae) on *Ziziphus jujuba* in Romania

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**Key words:** Mediterranean fruit fly, *Ziziphus jujuba*.

The Mediterranean fruit fly *Ceratitis capitata* (Wiedemann) (Diptera: Tephritidae) is a highly invasive pest species native from tropical Africa, widely spread in the Mediterranean Basin, Southern Europe and most tropical and subtropical regions throughout the world. It is considered the most important economic pest of fruit production worldwide, inflicting damage upon fruits of more than 300 plant species with high commercial value, including plums, peaches, apples, oranges, coffee, mango, avocado. The highly polyphagous ability and adaptable nature are the main factors that have allowed it to become established in areas with different climatic conditions.

In 2013, the presence of *Ceratitis capitata* was detected on *Ziziphus* species, in Bucharest and Moara Domnească areas (Southern Romania), a new fruit crop recently introduced in Romanian horticulture production. This was possible during the fruit flies trapping and fruit sampling network conducted in Romania within the framework of a regional project supported by IAEA Vienna to which the Plant Protection Institute is a partner. The specific Tephri Traps were used to detect and monitor the fruit flies placed in different fruit cultures.

The paper will present the adults morphology features, aspects of attack and the preliminary adult population dynamics of *Ceratitis capitata* based on the flies captures in traps correlated with the climatic conditions in the area.

The emergence of the Mediterranean fruit fly in our country could become a serious concern for horticultural crops; therefore in the forthcoming years it is necessary to extend the survey to different fruit trees in order to detect the spread and adaptation of this species to the climatic conditions of Romania.

# Characteristics of reproductive system in females of *Carassius gibelio* (Bloch, 1782) from water basins of Dniester and Prut (Republic of Moldova) during spawning period

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**Key words:** gonadosomatic index (GSI), oocyte generation, oocyte, gonads, vitellogenesis.

The biological analysis of sexually mature females from lower Dniester and Cuchurgan cooling reservoir revealed differences on the mean values of linear-weight indexes, which are determined by the environmental conditions of *Carassius gibelio* existence from different populations. Physiological condition of mature females in the pre-spawning and spawning periods is more favourable in individuals inhabiting the river. Higher values of growth rate and of relative weight of the gonads also contribute to a higher rate of reproduction of *Carassius gibelio* population in the lower course of Dniester. In the changed habitat and breeding conditions in *Carassius gibelio* from studied water basins the duration of vitellogenesis in oocytes has changed, which led to a shift in the beginning of the spawning season of fish. At the females from Cuciurgan cooling reservoir the increasing period of the intense vitellogenesis process led to a delayed spawning, while the fish in the lower course of Dniester River, because of the reduction of vitellogenesis period, a spawning shift to an earlier date occurred. Increased intensity of vitellogenesis in the oocytes of fish from the Lower Dniester provides higher values of gonad mass, of the GSI and of oocytes size in phase of completed vitellogenesis (E), and hence a higher reproductive capacity of females.

In spring during Prut River flooding and the formation of a common aquatic ecosystem of the lower river course with Beleu Lake, the spawning of the first generation of eggs in *Carassius gibelio*, in these bodies of water occur in the same dates (in third decade of April). The beginning of the spawning season in river individuals has not changed much over the past years (Fulga & Kiseliova, 2007). Later, at the decline of water level in Prut River, Beleu Lake is separated from the river lower course that leads to rapid heating of its water surface. As result, the processes of intensive vitellogenesis and egg maturation in females from the lake occur faster than in the river. Different habitat conditions of *Carassius gibelio* in Beleu Lake and lower Prut during summer cause changes in spawning timing of the second and third portions of eggs. After sweeping out the third generation of oocytes the fish ovaries from lower Prut pass in II-III stages, and in the individuals from Beleu Lake – In the III stage of maturity. As result the gonads' weight and the GSI value in river fish was significantly lower than that in the lake fish ($P > 0.95$).

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# Vector and annoying arthropods in Romania

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**Key words:** arthropods, vectors, vector-borne diseases, annoying arthropods, Romania.

Romania includes a very large scale of natural and anthropic ecosystems and habitats with favorable conditions for populations of different vector and annoying arthropod species: mosquitoes, ticks, sand flies, lice, fleas, synanthropic flies, cockroaches, bedbug and mites. These arthropod species are important for public health because of their role of biological and/or mechanical vectors for various pathogens, and some of these species can produce themselves diseases. On the other hand, these arthropods are annoying species.

The mosquitoes include the most important vector species in Romania. There are 16 potential vector species that could be involved in the transmission of West Nile virus and 4 anopheline species transmitting malaria. In addition, mosquito invasive vector species could establish in Romania because of the present environmental changes.

The tick-borne diseases with increased incidence are Lyme borreliosis and tick-borne encephalitis, but ticks transmit also babesiosis, erlichiosis, anaplasmosis, Crimean-Congo hemorrhagic fever and others.

The sand flies are vectors of leishmaniasis and three days fever that rarely appeared in Romania but the abundance and distribution of sand flies could extend because of the global warming.

The body louse transmits typhus caused by *Rickettsia* bacteria and relapsing fever caused by *Borrelia recurrentis* and fleas transmit plague. Now, the lice and fleas are not vectors in Romania.

House flies and cockroaches are important mechanical vectors for various pathogens.

Lice, fleas, bad bugs, mosquitoes, ticks and sand flies are hematophagous ectoparasitic arthropods and produce more or less severe dermatitis with allergic reactions in humans by their bites. House dust mites can also produce allergies.

Several arthropods produce themselves diseases: myiasis by synanthropic flies, pediculosis by lice, scabies by *Sarcoptes scabiei* or itch mite, demodicosis by *Demodex* sp.

The surveillance and control of populations of arthropod species are necessary in areas where they have impact on public health.

# Real-Time PCR methods for West Nile Virus detection in mosquito vectors

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**Key words:** *Culex pipens*, West Nile Virus, Real-Time PCR.

West Nile is an Arthropod Borne Virus (flavivirus) with RNA genome. The virus is transmitted in most of the cases by mosquitoes (culicids/vectors) and the reservoir is represented by birds. The virus causes encephalitis and meningoencephalitis (with clear cerebral-spinal fluid) in humans.

In 1996 the Bucharest and suburbs were affected by a meningoencephalitis outbreak caused by West Nile Virus (WNV). The WNV surveillance started at that moment comprised methods considered to be sensitive and sometimes even complementary, such as: hemagglutino-inhibition, suckling mice intracerebral inoculation, and ELISA.

The need to isolate and characterize some circulating WNV strains in Romania leads to use rapid molecular techniques as Real-Time PCR with the possibility to quantify the viral load.

The present work describes a comparison between two real-time methods used in our laboratory: one using SYBR® Green as intercalating dye and the second based on a TaqMan® fluorescent probe. Samples (*Culex pipiens* mosquitoes) were collected from different regions of the country including Bucharest and were inoculated as homogenates to suckling mice familes. The suckling mice brains were subject for total RNA isolation and than for Real-Time PCR analysis. The results showed that SYBR® Green method is a very simple, versatile and low cost analyse but it is not so accurate as is the TaqMan® method. The TaqMan® method described here is an absolute quantification analyse which give precious information regarding the vector viral load in samples taken from different geographic samplig sites.

# Feeding activity and stress response evaluation of transgenic *Caenorhabditis elegans* induced by some cationic and amphoteric surfactants

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**Key words:** cationic/amphoteric surfactants, feeding inhibition, reporter transgenes, stress inducibility, *Caenorhabditis elegans*.

*Caenorhabditis elegans* as a free living nematode is exposed naturally to different contaminants, and has been used in toxicity testing for several decades. Various surfactants widely used in cosmetic products, softeners or cleaners are discharged in sewage which may contaminate the local fresh water and soil. To assess the toxicity of selected compounds on this organism we evaluated feeding activity (Jones & Candido, 1999), in the presence of amphoteric surfactants: Cocamidopropyl betaine (CAPB), Cocamidopropyl hydroxysultaine (CAPHS) and cationic surface tension agents: Hyamine 1622 and Tetranyl. The optical density of bacteria used as a main food source (*Escherichia coli*) was measured by spectrophotometry (λ=550 nm), after 24, 48 and 72 hours, and increased significantly at test concentrations of 0.01 mg/l and 0.1 mg/l, suggesting that feeding of the mixed population was inhibited dose dependently. Lower concentrations, ranging between 0.00001 mg/l and 0.001 mg/l did not produce effects at any time point. *In situ* staining of the PC72 transgenic strain, (carrying an *hsp*-16.1: *lacZ* construct), treated with 0.01 mg/l Hyamine 1622, revealed β-galactosidase production under stress conditions (Guven et al., 1994). Molecular assays measuring the induction of stress-responsive genes via Green Fluorescent Protein (GFP) transgenes (Anbalagan et al., 2012) confirmed the activation of antioxidant/phase II defences during developmental larval stages when a synchronised population was used. GFP Expression Ratios (treated:control) for superoxide dismutase (*sod*-3, *sod*-4) and glutathione-S-transferase (*gst-1*) genes were elevated by 0.01 mg/l amphoteric surfactants and 0.001mg/l Hyamine 1622. In conclusion, 0.01mg/l of CAPB, CAPHS and 0.001mg/l Hyamine 1622, demonstrate the capability to inhibit pharyngeal pumping and to produce Reactive Oxygen Species which generate oxidative stress (Ivan, 2012). Therefore, we suggest that the sublethal concentrations tested might be ecologically relevant and could produce harmful effects on soil nematodes such as *Caenorhabditis elegans*, even though Romanian and international laws do not specify environmental limits for these compounds.

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# Light microscopical survey of the ovarian development stages in narrow-clawed crayfish *Astacus leptodactylus* Eschscholtz, 1823 (Crustacea: Decapoda: Astacidae)

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**Key words:** crayfish, ovary, oocytes, vitellogenic.

Freshwater biotas are in a continuous change due to the anthropogenic interventions and influx of ethiological agent of crayfish plague carried by an invasive crayfish species. Thus, it is very important to monitor the health status of macrodecapods, especially *Astacus leptodactylus* Eschscholtz, 1823*,* which is a native species of crayfish in Romania.

The study was conducted between October 2012 and September 2013 and several females were collected each month. The capture method was represented by trap nets and by fishing nets. The organs were sampled and the integrity of the ovary was evaluated. Total body length, wet body weight and gonadal weight data were collected. Only the organs which did not present pathological appearance were processed using histological method. The general structure of the ovary was described using the hematoxylin-eosin-alcian blue staining.

The light microscopical analysis revealed undergoing vitellogenesis between October and December, with ripe ovary and late vitellogenic oocytes and spawning in January-February. By the end of February fully developed eggs were present on the abdomen. Previtellogenic oocytes with homogenous cytoplasm, resorbed oocytes and oogonia were observed in oogonetic pouches. In summer the ovary was filled with previtellogenic and late vitellogenic oocytes and few early vitellogenic oocytes. The accumulation of yolk was observed by the end of July and August. The gonadosomatic index was higher in winter and reached the highest peak in February.

Tracing the normal ovarian development of *Astacus leptodactylus* could represent a helpful tool in identifying structural alterations due to exposure to pollutants and for a future comparison between other crayfish genera from its ecological niche.

# Modern state of the Siberian sturgeon populations of the Lena River (Republic of Sakha, Russia) and the perspectives for its artificial reproduction

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**Key words:** Siberian sturgeon, the Lena River, artificial reproduction.

This paper discusses the state of the stocks and the possibility of artificial reproduction of the Siberian sturgeon in Lena River. Total raised Siberian sturgeon in the upper, middle and lower Lena River reaches of the 351 specimens, including the determination of the age - 151 specimens. In the Lena River sturgeon extended to the north to the mouth, is in the Gulf of Neelova in wet years when a large freshwater runoff enters the Tiksi Bay and the coastal part of the bays Bulunkan and Sogo. It inhabits a number of tributaries of the Lena River - the rivers Vitim, Olekma, Aldan and Viluy. Based on our data, there is no difference in the rate of growth between different populations. This is probably due to the fact that in our materials older groups were represented in small quantities. In fresh waters of the Republic of Sakha (Yakutia), sturgeon fishing is only allowed in the Lena River. Distribution of sturgeon on the river has been uneven and has a connection with the food resources of a section of the river. To increase the number of sturgeon in the Lena River basin requires a number of measures including sustainable fisheries, protection of species during the spawning and winter migration, and artificial reproduction. Siberian sturgeon, characterized by the ability to live in wide temperature fluctuations, eats a variety of feeds, lack of instinct ramp. Lena sturgeon has high survival rates for all stages of the biotech cycle. For the quality of such work it is necessary to develop and implement a special program of research aimed at a detailed study of the Lena river sturgeon, covering a wide range of scientific and practical problems. All these properties of Siberian sturgeon population of Lena River collectively describe it as perspective target of pisciculture.

# The reproductive characteristic of three Moldavian carp breeds of new generations of selection (Republic of Moldova)

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**Key words:** breed, female, fecundity, generation, reproduction, carp.

Fecundity is one of the productivity indicators, which depends on both the environmental conditions and hereditary factors (Maslova, 2005).

We analyzed the reproductive characteristics of female carps of the new generation of three approved Moldavian carp breeds: Carp Teleneshtskiy Scaly, Carp Teleneshtskiy Frame, the fifth generation, and Carp Kuboltskiy Scaly, the seventh generation of selection.

Brood stock of three breeds of the 5th, 7th generations of selection used for reproduction process had a positive reaction to hormonal stimulation. Percentage of spawning females of Carp Teleneshtskiy Scaly, Carp Teleneshtskiy Frame and Carp Kuboltskiy Scaly was 86.7, 90.0, 88.9 %; working fecundity of females - 910, 930, 870 thousand units of eggs, respectively to the breeds. Realized fecundity, in the nature of yield the three-day larvae, was considerable: 500, 495, 470 thousand units per female, that is 1.88-2.0 times higher than standard estimates. Survival rates of larvae from eggs were 55, 53, 54%, respectively.

To define the state of the gonads of the autochthonous breeds of female carps in the period of artificial reproduction there were performed histological studies of ovulated eggs. Even-aged females were revealed dimensional distinction of trophic inclusions of oocytes by breeds and different quality of ovulated spawn of the same female: there are sex cells, morphological state that shows different degrees of degenerative changes.

Old age females of Carp Teleneshtskiy Scaly also revealed destructive changes that are expressed in the destruction of yolk granules, followed by homogenization of their contents.

According to the data of some authors (Statova et al., 1982) irregularities in the egg cells structure do not detain ovulation and spawning but lead to a decrease in its fecundating ability and further healthy embryo development.

The changes revealed in the sex cells of females of three breeds are caused by asynchronous oocyte growth in the period of vitellogenesis that in a particular way affect the technological characteristics of carp during artificial reproduction at different stages of ontogeny, in some way reducing the percentage of fertilization, egg development and yield the three-day larvae. These should be taken into account during selection works with the target program - fish fecundity increase.

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# Traffic mortality in Dobrudja (Romania). Case study: DN3 Constanța-Ostrov

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**Key words:** roadkill, protected species, Dobrudja, Romania.

At present, many plant and animal species have increasingly lower populations, reason why there is a constant concern on biodiversity conservation. This goal requires knowledge of why these species are in danger. Traffic is a direct mortality cause of wildlife, including protected species. In order to see how much the traffic of Dobrudja affect vertebrates in this region, we performed some routes in several roads of Dobrudja between November 2012 - October 2013. The bodies of 12 species, totalizing 27 specimens, were identified on the road. Many of them were on the roads which crossed protected areas or there were near them. From the identified species, the following ones are protected by the current legislation: *Felis silvestris* (OUG 57/2007, anx 4), *Coluber caspius* (OUG 57/2007, anx 4/4B), *Falco tinnunculus* (OUG 57/2007, anx 4B), *Canis aureus* (OUG 57/2007, anx 5A), *Mustela putorius* (OUG 57/2007, anx 5A), *Meles meles* (OUG 57/2007, anx 5B), *Nyctereutes procyonoides* (OUG 57/2007, anx 5B), *Vulpes vulpes* (OUG 57/2007, anx 5B), *Martes foina* (OUG 57/2007, anx 5B).

Taking into account that traffic is a necessary link in the regional and intra-regional developement, we consider that one of the protection measures for these species might be the constructions of tunnels under the roads (especially that reptiles and weasels prefer such pathways).

In order tu support this assertion, we chose DN 3 Constanța-Ostrov as a case stusy, where we made 26 trips along 7 months (April – October). Here, we found 12 animal bodies of 5 species. Out of them acestea 66.66% were in or near some protected areas.

Our recommendation is that these tunnels should be placed mainly on road segments passing through protected areas.

# Preliminary data on avian mortality due to human impact in Dobrudja, Romania

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**Key words:** industrial development, avian mortality, collision, poisoning, stray dogs, human activities, conservation**.**

In the current context of industrial development in Dobrudja, many human activities kill wild birds. In this case there are many individual observations, but the extent and effects on bird populations are not systematically evaluated.

The aim of the study was to identify the causes of avian mortality in Dobrudja, and to assess the geographic, seasonal and taxonomic variation on avian mortality in this region. Effort is still required to develop a stochastic model (Calvert et al., 2013), and to guide conservation efforts to minimize direct mortality caused by human activities.

During this study we collected data on mortality caused by: collision with wind turbines developments, collision with transmission lines, vehicle collision, collision with glass buildings, fishing industry, poisoning and stray dogs.

The study was conducted in 2010-2013 throughout Continental Dobrudja and the Danube Delta as part of a program of Intervention and Wildlife Rescue held by NGO SOEPME "Oceanic Club". Dobrudja is an important migration route for birds in Eastern Europe, with large concentrations of birds during migration periods.

Observations were made along transmission lines, inside wind turbines developments, along national and county roads, on the banks of lakes and the Black Sea. The most significant mortality is due to collisions with medium voltage transmission lines, followed by collision with vehicles and poisoning. Injured birds were treated and later released into the wild.

There are few data on avian mortality in Dobrudja (Petrescu, 2002) with reference to the Danube Delta. Significant mortality was recorded in populations of White stork (*Ciconia ciconia*) and Common buzzard (*Buteo buteo*), but rare species were found, protected by The Birds Directive (Directive 2009/147/EC on the conservation of wild birds) such as White pelican (*Pelecanus onocrotalus*), White-tailed eagle (*Haliaeetus albicilla*), Short-toed eagle (*Circaetus gallicus*), Long-legged buzzard (*Buteo rufinus*), Barn owl (*Tyto alba*), Black kite (*Milvus migrans*), Black-throated loon (*Gavia arctica*), Bittern (*Botaurus stellaris*), Whooper swan (*Cygnus cygnus*).

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# Status of colonial waterbirds populations from Inner Danube Delta (Romania)

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**Key words:** waterbirds, colonial piscivorous birds, Great Cormorant, *Phalacrocorax carbo*, Danube, Inner Danube Delta, Small Island of Brăila, conservation, man-birds conflicts, illegal fishing.

The study, conducted in the Inner Danube Delta, in the protected area of Small Island of Brăila, examined the structure and dynamics of the colonial waterbirds populations from 2007 to 2013, during the breading season. The research area is a Natura 2000, Ramsar and long term socio-ecological research site, situated along the Danube River, between Călăraşi and Brăila, and between Southern Romanian Plain and the Dobrogea Plateau. This site, covering an area of 24,555 ha, supports breeding populations of nine colonial waterbird species: Great Cormorant (*Phalacrocorax carbo*), Pygmy Cormorant (*Phalacrocorax pygmeus*), Night Heron (*Nycticorax nycticorax*), Squacco Heron (*Ardeola ralloides*), Little Egret (*Egretta garzetta*), Grey Heron (*Ardea cinerea*), Great Egret (*Ardea alba*), Spoonbill (*Platalea leucorodia*) and Glossy Ibis (*Plegadis falcinellus*). The Great Cormorant is by far the most abundant species nesting in the area, being followed by the Night Heron and the Little Egret. The main conservation concern is related to the illegal fishing activities, provoking accidental injuries or deaths to individual birds, caught in the fishing nets, or disturbances to the nearby breeding colonies. Other threats are determined by the intensive fishing, leading to the depletion of natural fish stock and, consequently, man-birds conflicts can arise in fish farms, which often are ending with illegal hunting. If further protection measures will not be taken, in the near future, the breeding success of these species will be seriously affected in the studied area.

# Migratory dynamics and habitat use of *Ardea alba* and *Egretta garzetta* (Ciconiiformes: Ardeidae) in the protected area of Dumbrăvița (Brașov, Romania)

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**Key words:** *Ardea alba*, *Egretta garzetta*, conservation, migration route, stopover point, Dumbrăvița.

The protected area of Dumbrăvița, Brașov County, consisting of an artificial lake on the Hamaradia River, and the surrounding area, hosts 114 bird species out of which 14 are protected through the Bird Directive, Appendix I. The site subscribes to the fifth migration route (Central-European-Bulgarian) that crosses Romania. This study focuses on the importance of the Dumbrăvița accumulation lake (180 ha) as a stopover point, for two protected egret species, the Great Egret (*Ardea alba*) and the Little Egret (*Egretta garzetta*), during their fall passage. Assessment of population size is important for designing future management solutions with regards to conservation.

Five counting points were established around the lake, in order to have the whole water surface and surrounding area covered. Results were gathered through weekly observations from July to October in 2009 and 2013, and compared with previous bibliographical data, from 1995 and 1997. Population size increased twofold in September for *Ardea alba* and up to 4 times in August for *Egretta garzetta*, correlating positively with the fall passage. The decreased flow of the Hamaradia River had a significant impact on the water level, leading to beach formation on the northern shore of the lake. The resulting amphibious habitat provided new feeding places, a potential cause for the increased size of the aforementioned populations. Half of the recorded number of little egrets was observed exploiting the northern shore in August 2013, where only a couple was recorded previously. Thus, an artificial decrease of the water level could be used during the fall passage, to provide attractive areas for the use of larger egret populations.

Stopover sites are crucial places for a successful bird migration. Monitoring local trends in the choice of stopover points offers insight to habitat quality, providing useful information for designing long-term conservation strategies.

# Efficiency of Natura 2000 Network in preserving the potential breeding habitats of the Eurasian stone-curlew *Burhinus oedicnemus* (L., 1758) in Romania

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**Key words:** Eurasian stone-curlew, Natura 2000, Maxent, potential distribution, environmental niche models.

Eurasian Stone-curlew breeds in dry or even arid habitats characterized by low precipitation and many hours of sunshine, with short or cropped vegetation. The total number of breeding pairs in Romania is impossible to asses due to lack of data, but has previously been estimated to 200-400 breeding pairs. Our work features a synthesis of the available data on the breeding of Eurasian stone-curlew (*Burhinus oedicnemus*) in Romania and explores the efficiency of the Natura 2000 Network in preserving the potential breeding habitat using environmental niche models (ENMs).

Suitability and binary models were developed using Maxent 3.3.3k and occurrence points from the literature and the authors' personal observations. Two scenarios were modeled - one where only environmental variables were used (S1) and one with both environmental predictors and landcover data (http://due.esrin.esa.int/globcover/) (S2), to account for the influence of human activities and land-use patterns on breeding site selection. All models were generated at a resolution of 30''. Data regarding the national network of Natura 2000 sites were downloaded from the Ministry of Environment (www.mmediu.ro).

Both models developed were statistically significant (S1: z=-3.009, p=0.0026; S2: z=-2.735, p=0.0062) and obtained high AUC scores. Our models indicate that, in Romania, suitable habitat conditions for the Eurasian stone-curlew to breed are mostly restricted to the south-western part of the Romanian Plain and Dobrudja. Scenario S1 covers about 38623 km$^2$ of predicted presence, of which only 14208 km$^2$ are covered by SPA network while S2 covers about 43527 km$^2$ of predicted presence, of which 13625 km$^2$ are covered by the SPA network. Thus, only 31.3-36.7% of potential breeding habitat is covered by SPAs and 26-31% by SCI sites, which seems to contradict previous estimation that 92% of the breeding population breeds inside special protection areas (Papp & Fântână, 2008).

These preliminary results raise a question mark on the efficiency and the criteria used in designating Natura 2000 sites in Romania, especially in the case of species with strict ecological requirements, such as the Eurasian stone-curlew.

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# Nest site selection of three woodpecker species (Aves: Piciformes) in Comana Forest (Southern Romania) and its implication for woodland conservation

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**Key words:** woodpecker, nest, snag, dead trees, nesting ecology.

Primary cavity nesters as woodpeckers are particulary vulnerable to intensive forestry management, requiring specific condition for excavating their nests, especially decaying wood. Those structures are the first removed in forestry management, leaving less suitable places for woodpeckers to excavate their nest. As a consequence, habitat quality is decreasing, having a negative impact over woodpeckers population. Species like *Dendrocopos medius* has suffered strong decline through Europe, being now included in Annex I of the Birds Directive of the European Union listing threatened species that require special conservation measures for their habitat.

In Comana forest the woodpecker population is under protection at national and European level (natural park and Natura 2000 site) being well represented, by nine of the ten European species.

Nest site selection of three woodpecker species: *Dendrocopus major, Dendrocopus medius* and *Dendrocopus minor* was examined after five years of monitoring in Comana Forest, from Comana Natural Park. We gathered and analysed data describing characteristics for 49 nest sites belonging to the three species. We focus on nest tree species, condition and diameter, also on sorrounding habitat characteristiscs and forest composition. All the species showed strong preferences for large trees, oaks and lime, with advanced state of decaying wood. Nest sites for the three species differ with respect for tree condition and distance from roads and anthropic sites, with implication over the distribution and foraging territories, also for conservation decision.

We conclude that woodpeckers require specific monitoring and management efforts, being a "key-stone" species and indicator of forest condition.

# Possibilities for restoration of Eurasian beaver (*Castor fiber*) in the Danube Delta Biosphere Reserve, Romania

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**Key words:** beaver, *Castor fiber*, reintroduction.

This study had as starting point the WWF-DCP initiative Rewilding Europe whose purpose is to balance economic interests with community development as a basis for improved quality of life in the context of sustainable development of communities.

The presence of beaver in the Danube Delta, in the past, is a very disputed subject in the scientific world, due to lack of archaeozoological evidence, but considering that after only 15 years of the first actions of its reintroduction in Romania, more beaver copies were reported in the upper DDBR, it is unlikely that this species to miss from an ecosystem that gives ideal conditions for life.

In the field there were evaluated 185 km of habitat, using the Heidecke method.

After the field work all the sectors were sorted in four categories of habitat: optimal, good, adequate and inadequate. 33.3% (61.83 km) of habitats are optimal, 31.7 (58.99 km) good, 34.1% (63.40 km) adequate and 0.9% (1.65 km) inadequate.

The restocking zone includes 62 Km of optimal habitats at the south of Sf. Gheorghe arms and the Sulina depression. The beaver necessary flock for restocking is composed by 11 families with a total of 44 beavers resettled from the Romanian conflict areas.

The field study identified a number of anthropogenic factors of disturbance that may have negative impact on the success of restocking with beaver in the studied area: presence of fishing nets, channel dredging and alluvial material storage on sides, the harvesting of timber and the uncontrolled tourism.

# Noninvasive methods in research and conservation of the Black Sea cetaceans at the Romanian coast

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**Key words:** cetaceans, photo-identification method, pingers/ADD, Romanian Black Sea waters.

In the Black Sea, the cetaceans are represented by three species, *Phocoena phocoena relicta*, *Tursiops truncatus ponticus* and *Delphinus delphis ponticus,* not to well known at ecological level. The main threat and cause of decline for cetaceans is represented by fishing nets, so-called bycatches. As response to this particular problem, in 2010, we had introduced the device called pinger/ADD, as a deterent device which signal the presence of fishing net and intend to keep testing them for a period of 5 years.

Mare Nostrum NGO under E.U. and ACCOBAMS financing has developed a programme for cetacean monitoring, through which collects data about sightings, bycatches, strandings during sea and land surveys and also putting the bases for first aid. Concerning the protection state of the Black Sea cetaceans in accordance to which the catching and disturbing of cetaceans are prohibited, we introduced the method of photo-identification for collecting information about individuals and groups.

Relevant is the fact that in the last few years, due to the joint work of our specialist and partners from National Institute of Marine Research and Development "Grigore Antipa", National Agency of Romanian Waters, Costal Guard, fishing associations and educational institutions, new social behaviours reflecting the public concern regarding the dolphin's population status from Romanian seaside were created, and also increased substantially occurrences of dolphins in some coastal areas and decreasing the number of strandings.

# Between the conservation of cultural heritage and conservation of biodiversity – case study: bat colony (Chiroptera) from Humor Monastery, Suceava County (Romania)

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**Key words:** bat colony, conservation, cultural heritage.

Recently, the Romanian restorers of monuments began face problems caused by the presence of bats' shelters in churches' attics. The ideology of the religious caretakers does not agree the presence and the protection of these mammals inside the church's space, but the conservation of bats colonies is required by law.

We found a bat mixed colony with the species *Myotis myotis*, *Myotis oxygnathus* and *Plecotus austriacus* inside the Humor monastery, UNESCO patrimony site. In early '90s, this colony was about some hundreds individuals but it presented a constant negative trend during the last ten years. The monastery's administration does not agree to implement one efficiently method to preserve the roof and mural picture, but also the bat colony through avoiding to disturb it. The mortality rate was high during the 2012 summer – we collected 30 mummified bats, but the reason of their death is unknown and the guano traces give us information of one small active colony.

The church's administration regards the bats like agents of biodegradation; they can affect the mural picture directly, with their claws, but also indirectly, through their guano and urine. The specialists present suitable methods to preserve the monument and the protected bat species, too.

The education and information campaigns on the importance of bat colonies' protection remain the most important challenge for the biologists.

# Monitoring conservation status of Natura 2000 medium and large size terrestrial mammals in Romania

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**Key words:** mammal monitoring scheme, Natura 2000 monitoring, favorable conservation status, EU habitat directive.

Mammal species listed on the annexes of EU Habitat Directive (92/43/EEC) have to be maintained in a favorable conservation conditions. To achieve this goal, monitoring programs need to be implemented at national level in order to assess the species status. The following work is proposing a monitoring scheme for ten large and medium size terrestrial mammals: *Ursus arctos*, *Canis lupus*, *Canis aureus*, *Felis silvestris*, *Lynx lynx*, *Rupicapra rupicapra*, *Martes martes*, *Lutra lutra*, *Castor fiber* and *Mustella lutreola*. The monitoring scheme was designed in accordance with the requirements specified by article 17 of EU Habitat Directive and it has to provide information about population size, habitat conditions, as well as threats and pressures that can affect species conservation status. A reference grid of 10 x 10 km$^2$ was used to select the monitoring plots at country level. In order to develop an optimized monitoring scheme the ten species were associated in four functional groups considering their habitat and feeding preferences. Selection of monitoring plots was done in a stratified random approach having as strata population size, biogeographical regions, Simpson's diversity index and land use land cover data. The number of plots was established in order to cover at least 10% of species ranges encountered at national level. Thus, a total number of 248 plots of 10 x 10 km$^2$ were selected with the following distribution per biogeographical region: 58 for Alpine, 13 for Black Sea, 127 for Continental, 21 for Pannonic, and 29 for Steppic. The selected monitoring plots assure an estimation of population size with 95% confidence level based on Z-statistical test.

# Why did the large carnivore cross the road? A permeability study using species distribution modelling

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**Key words:** large carnivores, highway, trail cameras, species distribution modelling, MaxEnt, GIS.

A highway is proposed to be constructed between Lugoj and Deva, sectioning what it is considered to be the last corridor between the Apuseni Mountains and the Southern Carpathians, used by the local fauna in the dispersal or local migration process. A barrier of this importance for the mobility of the populations found in the above mentioned areas can lead to local extinctions by limitations of the genetic flow. The large carnivores were selected because they are umbrella species and have the highest sensibility to habitat fragmentation.

During 2013, data were collected using observations of tracks, marks and trail cameras that were evenly distributed across the landscape in certain bottlenecks identified on the field. Attractants were used to increase the chances of capturing a photograph of interest.

Observations were also collected from the local NGO's that monitored the area for a larger period of time. Data available at the local forestry service and hunting funds were considered irrelevant due the fact that observations could not be spatially positioned with high accuracy.

Using heads up digitizing in a GIS environment, spatial data were collected for the study area, and transformed into multiple raster datasets, which included the digital elevation model, the land use, distance from road, settlements and water courses or bodies, at high resolution. Using part of the observation points as training data; a MaxEnt potential species distribution model was generated for each species that contained a satisfying number entryes: *Canis lupus*, *Lynx lynx*, *Ursus arctos*, *Capreolus capreolus*, *Cervus elaphus* and *Sus scrofa*.

The results were used to narrow down areas that are important for all of the large carnivores and their pray. The intersection of these areas with the proposed highway can be used as an indicator for the location of the proposed mitigation measures, such as green bridges or large viaducts, which will be constructed in order to increase the permeability of the area once the highway is operational. The obtained areas should not be considered as final proposals due to the lack of a relevant monitoring period and a poor spatial coverage. Further studies have to be conducted in order to validate the model and generate more accurate locations.

# Paleontological collections of a museum – witness the geological evolution of a territory. Case study: Natural History Museum Sibiu (Romania)

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**Key words:** fossils, museum collections, geological evolution of a territory.

Geological studies on the development of a territory throughout the history of geology and even on the possible economic importance include paleontological studies. Because a fossil often represents a unique piece to its species and to the outcrop, museum collections – as preservers of paleontological heritage – remain the only sources of information regarding the age of layers. Museum collections include evidence-data about the evolution of a territory in the same way as archives contain data about human history.

The surroundings of Sibiu are characterized by lithological diversity and especially by the large development of sedimentary formations of Cenozoic age (about 2/3 of the county of Sibiu), therefore by the variety and richness of the contained fossil fauna. From this point of view the region represents a gateway to earth's history.

Fundamental researches regarding the geology of southern Transylvania were and are also conducted through researching the paleontological collections of Natural History Museum. In this paper we aim to highlight the fossiliferous outcrop – made famous by citations in specialized literature – around Sibiu which are present in the paleontological of Natural History Museum. We will correlate the paleontological data with the development of the territory around Sibiu. We will present, in table form, the fossil outcrop collection (over 26) and the fossiliferous groups to which the specimens belong.

For example, outcrops like Săcădate-Daia-Cornăţel, present in the museum's collections and presented in the paper, provide data about local conditions of the Sarmatian Sea. The conservation of flora and fauna in this region leads to the conclusion of the existence of not too deep water in this area, an age of orogenic calm when a material with fine granulation would deposit. Because bottom waters are devoid of oxygen, they were characterized through the absence of benthonic fauna which would consume organisms fallen from above destroying every trace of their existence. Fish living in oxygenated areas, leaves, insects (fossil groups present in collections), brought by air currents from land, reached the bottom and fossilized and weren't devoured, as a site rich in fossils has not only rich fauna, but also optimal conditions for fossilization.

# Notes on "Alexandru Roșca" spider collection from the "Grigore Antipa" National Museum of Natural History (Bucharest, Romania)

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**Key words:** Araneae, collection, Romania, Moldova, Ukraine.

According to the certificate No 1582 dating back to 26.07.1972, the "Grigore Antipa" Museum acquired the collection of 1526 specimens representing 596 Araneae species sold by Todoraș Olivia (Alexandru Roșca's daughter). The collection came in handmade cardboard boxes containing glass vials with rubber covers. It was accompanied by the register that included the following information: species name, number of specimens, locality (mostly names of settlements) and the date of collection. The material was collected by Dr. A. Roșca from Romania, Ukraine, Moldova, and Bulgaria within the period 1925-1964. Later certain specimens from the „Alexandru Roșca" collection were verified by the German and Romanian arachnologists (Braun, 1981; Sterghiu, 1985; Urak & Weiss, 1997; Petrișor, 1999; Fuhn & Gherasim, 1995) and a part of the collection was rearranged into glass tubes, placed in plastic jars with 70% alcohol (Petrișor, 1999). The rest of the collection is as it was received and requires reorganization and verification.

In December, 2012 and subsequently in 2013 we re-identified 269 specimens, which were mentioned in the collection belonging to Mimetidae (2), Oxyopidae (12), Pholcidae (15), Theridionidae (104), Eresidae (1) and Salticidae (135); we also verified 12 specimens of Pisauridae which were mentioned in the collection belonging to Lycosidae. The verified part of the "Alexandru Roșca" collection includes 60 valid species. Re-identification of the specimens actually present in the Bucharest museum yielded records of 2 spider species previously not recorded for Romania: *Pholcus ponticus* Thorell, 1875 (Sibiu County) and *Pisaura novicia* (L. Koch, 1878) (Dâmbovița County). *Pisaura novicia* is further recorded from northern Dobrogea (Romania) and for the first time from the physiographic zone of the Ukrainian Carpathians based on our own material.

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# Romanian species of lucanids (Coleoptera: Scarabaeoidea: Lucanidae) in the collections of "Grigore Antipa" National Museum of Natural History (Bucharest, Romania)

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**Key words:** Coleoptera, Lucanidae, Romania, collections, "Grigore Antipa" National Museum of Natural History.

Of the sixteen lucanid species which are mentioned in Europe, only seven species are known in Romanian fauna: *Aesalus scarabaeoides scarabaeoides* (Panzer), *Ceruchus chrysomelinus* (Hochenwarth), *Sinodendron cylindricum* (Linnaeus), *Lucanus cervus cervus* (Linnaeus), *Platycerus caraboides caraboides* (Linnaeus), *Platycerus caprea* (De Geer) and *Dorcus parallelipipedus* (Linnaeus). These species belong to four subfamilies according to the Catalogue of Palaearctic Coleoptera (Bartolozzi & Sprecher-Uebersax, 2006).

We examined the specimens from the following collections:

- Palaearctic Coleoptera Collection which contains Eduard Fleck, Deszö Kenderessy, Fridrich Deubel and Arnold Lucien Montandon collections, acquired between 1883-1923 and specimens collected by Richard Canisius;
- "Dr. Nicolae Săvulescu" collection acquired between 1961-1982;
- Lucanidae collection organized by us, containing specimens collected by Dr. Nicolae Săvulescu, Emil Varadi, specialists of the Museum and their collaborators, and specimens donated by Viorel Ungureanu, Engr. Igor Ceianu, Dr. Vladimir Brădescu and Dr. Mihai Şerban Procheş.

In the Museum's collections all the seven species are present. After studying the lucanids we can conclude that *Lucanus cervus cervus* and *Dorcus parallelipipedus* are well represented. *Aesalus scarabaeoides scarabaeoides* is known only from Comana forest (Giurgiu County, coll. A. L. Montandon) and *Platycerus caprea* is known from Cruce (Suceava County, coll. A. L. Montandon) and Jiul de Vest Valley.

Distribution maps in Romania are given for all the seven species.

*Lucanus cervus* is protected by the national legislation, being included in the Annexes 3 and 4 A of OUG 57/2007, on the regimen of the protected natural areas, conservation of the natural habitats, of wild flora and fauna. It is registered in the second appendix of the Habitats Directive of the European Union from 1992, which requires that member states set aside Special Areas of Conservation. The species is also registered in the third appendix of the Convention on the Conservation of European Wildlife and Natural Habitats (Berne convention) of 1982.

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# PHOTO EXHIBITION

# Moroccan exploits. "Dakhla" (2012) and "Merzouga" (2013) scientific expeditions [Collective photo exhibition]

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**Key words:** Morocco, scientific expeditions, "Grigore Antipa" Museum, Oceanic Club, Romania.

"Grigore Antipa" National Museum of Natural History maintains a long tradition in organizing scientific expeditions in various parts of the world: 1973, 20 November – 1974, 5 February: the first scientific expedition abroad, organized by the museum on the East coast of Africa (Tanzania) led by Acad. Dr. Mihai Băcescu; 1991, February – June: a scientific expedition organized by the museum in the Indonesian archipelago; 1994, 11 April – 12 July: a scientific expedition organized by the museum in collaboration with the Catholic University "Santa Ursula" Rio de Janeiro, in Brazil.

In 2005, at the invitation of and in collaboration with the Oceanographic Exploration and Marine Environment Protection Society "Oceanic Club" (Constanța, Romania), "Grigore Antipa" National Museum of Natural History (Bucharest, Romania) resumed the tradition of organizing scientific expeditions outside Romania. The collaboration formed the basis of development for a separate chapter within the museums worldwide fauna research base program. Thus a more focused research interest appeared concerning the biodiversity in areas bordering the Mediterranean basin.

Since 2005, the Museum has been involved in organizing several expeditions to some areas of interest, within the project, along with Oceanic Club, as follows: 2005 – "Taurus" expedition (in Turkey); 2006 – "Punia" expedition (in Tunisia); 2006 – "Focida" expedition (in Turkey); 2007 – "Atlas" expedition (in Morocco); 2008 – "Euphrates" expedition (in Syria); 2009 – "Bolkar" expedition (in Turkey); 2010 – "Sabkha" expedition (in Syria).

The more recent endeavors, the "Dakhla" (2012) and "Merzouga" (2013) scientific expeditions (getting their name after important geographical points of the proposed routes) were organized in the Moroccan territory, within the period 20$^{th}$ of March – 16$^{th}$ of April 2012 and 03$^{th}$ of May – 08$^{th}$ of June 2013 by "Grigore Antipa" National Museum of Natural History in partnership with the above mentioned Oceanographic Exploration and Marine Environment Protection Society "Oceanic Club", SEO/ BirdLife, Morocco programme, the Research Group for Bird Protection of Morocco – GREPOM and Scientific Institute of Mohammed V University (Rabat, Morocco).

The main purpose of these expeditions was to bring significant new contributions to the knowledge of biodiversity of Morocco by exploring some less approached geographical areas from this point of view and to gain insight on the possible influence of climatic changes on species zoogeography; the actual focus being on micromammals and their external parasites, birds and their external/

internal parasites, arachnids (spiders in particular) and insects (with a focus on diptera, orthoptera and coleoptera).

The last two expeditions are the subject of the collective photo exhibition.

Many thanks are in order to all of the contributing “artists”, fellows of the Moroccan adventures.

# AUTHORS' INDEX

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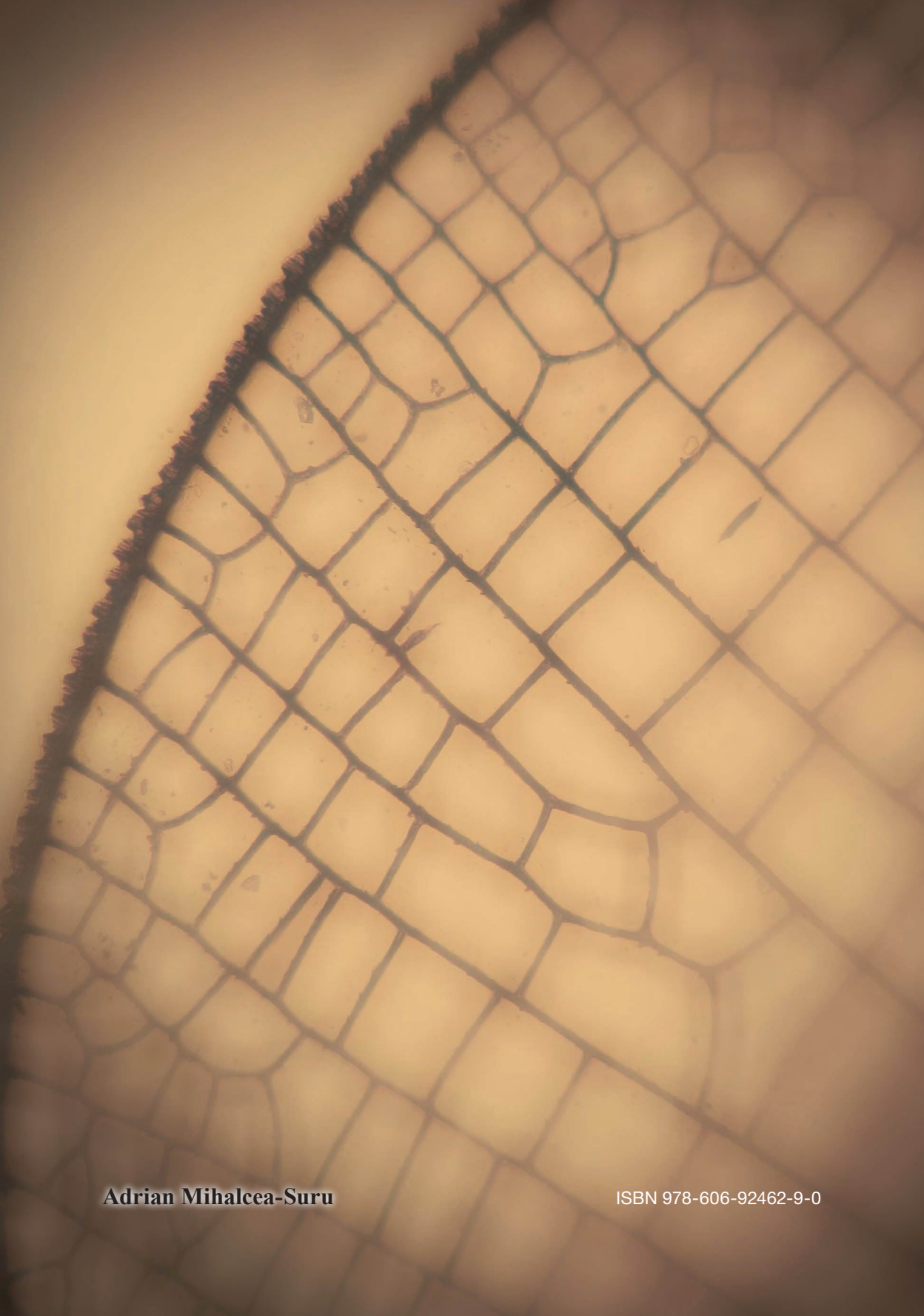

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