

SIEEC 22



Varaždin 2011

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SYMPOSIUM INTERNATIONALE

ENTOMOFAUNISTICUM EUROPAE CENTRALIS XXII

29.06.-03.07.2011. Varaždin, Croatia

Programme of the 22. Symposium internationale entomofaunisticum Europae centralis – SIEEC22

29 June – 3 July 2011 Varaždin, Croatia

Varaždin City Museum, The Herzer Palace, Franjevački trg 6, Varaždin, Croatia

Organizers: Permanent Committee of SIEEC, Croatian Entomological Society
and Varaždin City Museum



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INFORMATION

All **lecture sessions** will be in the conference hall located at the last floor of the Varaždin City Museum, The Herzer Palace.

Posters will be presented in the exhibition hall on the ground floor of the Varaždin City Museum, The Herzer Palace. Posters could be mounted to the panels from Wednesday morning.

The participants who are interested will have the opportunity to publish an article in **Entomologia Croatica**, as the proceedings of the Symposium will be published as a special volume of this journal. The homepage for Entomologia Croatica: <http://hrcak.srce.hr/entomologia-croatica?lang=en> provides links to online content and information for authors, as well as other details.

The cost of the Proceedings is included in the Symposium registration fee.

The deadline for submission of manuscripts is 1 November 2011.

COMMITTEES

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Prof. Dr. Boris Hrašovec
Prof. Dr. Mladen Kučinić
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Programme of the 22. Symposium internationale entomofaunisticum Europae centralis – SIEEC22

Wednesday/Mittwoch/Srijeda 29.06.2011.

- 9.00 – 11.00 Registration / Registrierung / Registracija
- 11.00 – 12.00 Wellcome address, laudatio / Eröffnung, Preisverleihung / Otvaranje simpozija, podjela svečanih medalja
- 12.00 – 13.00 **Paula Durbešić: HRVATSKA ENTOMOFAUNA iz sadašnjosti pogled unatrag i planovi za budućnost / CROATIA'S ENTOMOFAUNA Looking back from the present and plans for the future** (Plenary lecture / Plenarvortrag / Plenarno predavanje)
Abstract 1
- 13.00 - 14.30 Lunch break / Mittagspause / Pauza za ručak

SESSION 1

Moderator: Aleksandar Popijač

- 14.30 - 14.50 **Butterflies of Croatia: status, threats and conservation**
Abstract 31 Martina Šašić & Iva Mihoci
- 14.50 – 15.10 **Contribution to the knowledge of lady-birds (Coleoptera, Coccinellidae) of Croatia**
Abstract 17 Toni Koren, Mladen Zadavec, Ivana Rojko & Dina Hlavati
- 15.10 – 15.30 **How much do we know about Croatian spiders? – Historical overview of the publications**
Abstract 15 Luka Katušić & Mihael Drakšić
- 15.30 – 15.50 **One genus and three species of ants (Hymenoptera: Formicidae) new for Croatia**
Abstract 13 Ana Ješovnik, Jelena Bujan & Gregor Bračko
- 15.50 - 16.20 Coffee break / Kaffepause / Pauza za kavu

SESSION 2

Moderator: Aleksandar Popijač

- 16.20 – 16.40 Varaždin City Museum: **Virtual tour through “The world of insects”** / Stadtmuseum Varaždin – Virtueller Rundgang durch “Die Welt der Insekten” / Gradski muzej Varaždin: Virtualna šetnja "Svijetom kukaca"
- 16.40 – 17.30 State Institute for Nature Protection - **Gathering and centralizing the data on biodiversity of Croatia through the development of faunistic database *CRO Fauna*, as part of Nature Protection Information System (NPIS), and *EU Natura 2000 Integration Project (NIP)*** / DZZP - Prikupljanje i centraliziranje podataka o biološkoj raznolikosti Hrvatske kroz uspostavu jedinstvene faunističke baze *CRO-fauna* kao dijela Nacionalnog informacijskog sustava zaštite prirode te *Projekt integracije u EU Natura 2000 (NIP)*
- Abstract 4**
- 17.15 - 18.30 Tour thorough the exhibition of the Entomological Department, 1. group / Besichtigung der Ausstellung der Entomologischen Abteilung 1. Gruppe / Razgledavanje Zbirke Entomološkog odjela 1. grupa
- 19.00 - 21.00 Meeting of the SIEEC Permanent Committee / SIEEC-Komiteesitzung / Sastanak Središnjeg odbora SIEEEEC-a

Thursday/Donnerstag/Četvrtak 30.06.2011.

SESSION 3

Moderator: Matúš Kúdela

- 9.30 – 10.30 **Michael Malicky & Fritz Gusenleitner: Literatur, Biografien, Arten – Die ZOBODAT, das digitale Archiv des Biologiezentrums in Linz als naturkundliche Informationsquelle / Literature, Biographies, Species – ZOBODAT, the digital archive of the Biology Centre in Linz, an information source for people interested in natural history** (Plenary lecture / Plenarvortrag / Plenarno predavanje)
- Abstract 2**
- 10.30 – 10.50 **The first atlas of European dragonflies and damselflies (Odonata)**
- Abstract 8** Klaas-Douwe B. Dijkstra, Vincent J. Kalkman & Jean-Pierre Boudot
- 10.50 – 11.10 **Does spatial and temporal distribution of records enable production of Atlas of dragonflies (Odonata) of Croatia?**
- Abstract 9** Matija Franković, Tomislav Bogdanović & Robert Španić
- 11.10 - 11.40 Coffee break / Kaffepause / Pauza za kavu

SESSION 4

Moderator: Ignac Sivec

- 11.40 – 12.00 **Unser derzeitiger Kenntniss über die Zwergwasserkäfer (Coleoptera: Hydraenidae) in Ungarn / The present knowledge of Minute Moss Beetles (Coleoptera: Hydraenidae) in Hungary**
Abstract 19
Andor Lókkös
- 12.00 – 12.20 **A new remarkable troglobitic pselaphide (Staphylinidae: Pselaphinae: Bythinini) from Velebit Mt., Croatia**
Abstract 26
Dragan Pavićević & Roman Ozimec
- 12.20 – 12.40 **Stonefly (Plecoptera) fauna in the lower reach of the Una River**
Abstract 29
Aleksandar Popijač & Ignac Sivec
- 13.00 – 14.30 Lunch break / Mittagspause / Pauza za ručak

SESSION 5

Moderator: Božena Barić

- 14.30 – 14.50 **Geometrid moths of Croatia: diversity, biogeography and future activities**
Abstract 22
Iva Mihoci & Axel Hausmann
- 14.50 – 15.10 **Butterfly and moth (Lepidoptera) monitoring in the Nature Reserve Škocjanski zatok, Slovenia**
Abstract 28
Slavko Polak
- 15.10 – 15.30 **Bewertung der ungarischen Wanzen (Insecta, Heteroptera) aus Naturschutzaspekt / Evaluation of true bugs of Hungary from nature conservation aspect**
Abstract 16
Elöd Kondorosy
- 15.30 – 15.50 **Strogo zaštićene i zaštićene vrste u entomofauni Specijalnog rezervata prirode Zasavica / Strictly protected and endangered species in fauna of the Special Nature Reserve Zasavica**
Abstract 30
Mihajlo Stanković
- 16.00 - 16.30 Coffee break / Kaffepause / Pauza za kavu
- 16.30 - 18.00 Poster session / Posterpräsentation / Posterska izlaganja

Friday/Freitag/Petak 01.07.2011.

Trip to the Lonjsko polje Nature park / Exkursion Naturpark Lonjsko polje / Cjelodnevni izlet u PP Lonjsko polje

8:00 Departure from Varaždin

10:00 Arrival at the Lonjsko polje Nature Park; coffee break with traditional pastries and cakes

10:45 We enter the Park and start a guided tour. It will last approximately 6 hours with lectures and sightseeing of wetlands together with traditional houses, villages and beautiful landscapes. Special attention will be given to Čigoč - „the first European Stork Village“ and co-existence of storks and humans.

16:30 (approximately) Lunch break in traditional household with homemade traditional dishes.

18:30 (approximately) We leave for Varaždin.

20:30 (approximately) Arrival to Varaždin.

Saturday/Samstag/Subota 02.07.2011.

SESSION 6

Moderator: Wolfram Graf

- 9.30 - 10.30 **S. U. Pauls: Biogeography of European Aquatic Insects –Insights from Molecular Systematic and Phylogeographic Case Studies**
Abstract 3 (Plenary lecture / Plenarvortrag /Plenarno predavanje)
- 10.30 – 10.50 **Blackflies from the *Simulium reptans* group (Diptera: Simuliidae) in Central Europe**
Abstract 18 Matúš Kúdela, Ladislav Jedlička & Tatiana Brúderová
- 10.50 – 11.10 **Morphological and genetical characterization in *Praon dorsale-yomenae* group: preliminary research**
Abstract 23 Ana Mitrovski Bogdanović & Željko Tomanović
- 11.10 - 11.40 Coffee break / Kaffepause / Pauza za kavu

SESSION 7

Moderator: Marija Ivezić

- 11.40 – 12.00 **New molecular markers for deep phylogeny of Coleoptera: a bioinformatic approach**
Abstract 6 Branka Bruvo Mađarić, Željka Pezer, Joan Pons & Đurđica Ugarković
- 12.00 – 12.20 **Convergent evolution of albinism in cave adapted plant hoppers**
Abstract 5 Helena Bilandžija, Helena Četković & William R. Jeffery
- 12.20 – 12.40 **Highly repeated non-coding DNA in *Tribolium castaneum* (Coleoptera) genome**
Abstract 27 M. Pavlek, M. Plohl & N. Meštrović

13.00 - 14.30 Lunch break / Mittagspause / Pauza za ručak

SESSION 8

Moderator: Enrih Merdić

- 14.30 – 14.50 **Netless filter-feeding caddisflies in Europe**
Abstract 10 Wolfram Graf, Ana Previšić, Mladen Kučinić, Steffen U. Pauls & Johann Waringer
- 14.50 – 15.10 **Microhabitat preference and emergence patterns of Diptera (excluding Chironomidae) in the springs of Bijela rijeka and Crna rijeka, NP Plitvice**
Abstract 12 Marija Ivković & Zlatko Mihaljević
- 15.10 – 15.30 **Emergence of caddisflies (Trichoptera, Insecta) at lakes and tufa barriers in the Plitvice Lakes National Park**
Abstract 32 Petra Šemnički, Ana Previšić, Marija Ivković, Kristina Čmrlec & Zlatko Mihaljević
- 15.30 – 15.50 ***Aedes albopictus* invasive mosquito species in Croatia**
Abstract 20 Enrih Merdić, Goran Vigenjvić, Ivana Vručina, Mirta Sudarić Bogojević, Željka Jeličić Marinović, Željko Zahirović, Toni Žitko, Nediljko Landeka & Ana Klobučar
- 16.30 - 18.00 Tour thorough the exhibition of the Entomological Department, 2. group / Besichtigung der Ausstellung der Entomologischen Abteilung 2. Gruppe / Razgledavanje Zbirke Entomološkog odjela 2. grupa

19.30 - 22.00 Banquet (with group photo) / Festessen / Svečana večera

Sunday/Sonntag/Nedjelja 02.07.2011.

SESSION 9

Moderator: Boris Hrašovec

9.30 – 9.50 ***Xylosandrus germanus* (Blandfort, 1894) (Curculionidae: Scolytinae) in Slovenia**

Abstract 14 Maja Jurc, Danijel Borkovič, Roman Pavlin & Gregor Meterc

9.50 – 10.10 **Web-spinning sawflies *Cephalcia* spp. (Hymenoptera, Pamphiliidae) in the Northern Slovenia: epidemic density and prediction**

Abstract 21 Gregor Meterc, Danijel Borkovič & Maja Jurc

10.10 – 10.30 **Random fauna of true bugs (Heteroptera) caught by Csalomon® VARb3 funnel traps at science-educational station Jazbina in Zagreb**

Abstract 25 Ivana Pajač & Božena Barić

10.30 - 11.00 Coffee break / Kaffepause / Pauza za kavu

SESSION 10

Moderator: Boris Hrašovec

11.00 – 11.20 **Ant communities in Croatian basophilous fens**

Abstract 7 Jelena Bujan, Andreja Brigić, Renata Šoštarić & Zorana Sedlar

11.20 – 11.40 ***Harmonia axyridis* Pallas – Asian lady beetle – a new fauna member in Croatia**

Abstract 11 Marija Ivezić, Emilija Raspudić, Siniša Jelovčan & Krešimir Šoh

11.40- 12.00 **Coprophagous and coprophilous beetles (Coleoptera) of Biokovo Mt. (Dalmatia, Croatia)**

Abstract 24 Roman Ozimec, Lana Baričević, Mladen Kučinić

12.00 - 12.15 Closing ceremony / Schlussveranstaltung / Zatvaranje, poziv na sljedeći simpozij

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ABSTRACTS

LAUDATIOS

**Laudatio zur Auszeichnung mit der
„Ehrenmedaille für herausragende Leistungen auf dem Gebiet der Entomofaunistik“
(In Scientia Entomofaunistica Excellenti)
für Professor FRANZ RESSL
anlässlich des 22. Internationalen Symposiums für Entomofaunistik in Mitteleuropa
(SIEEC XXII) am 29. Juni 2011 in Varaždin (Kroatien)**

Das Leben und die faunistische Tätigkeit von Franz Ressler (geboren 1924) werden gewürdigt. Obwohl er keine Gelegenheit für eine höhere Schulbildung finden konnte, hat er aus persönlichem Interesse Natur und Vorgeschichte der Umgebung seines Wohnortes Purgstall (Niederösterreich, Bezirk Scheibbs) in sorgfältiger Detailarbeit studiert und sich die notwendigen Fachkenntnisse durch den Kontakt mit kompetenten Wissenschaftlern erworben. Neben zahlreichen Publikationen in Zeitschriften und in der Tagespresse sind aus seiner Tätigkeit die vier Bände Zoologie der „Naturkunde des Bezirkes Scheibbs“ hervorgegangen. Durch die Tätigkeit von Franz Ressler kann der Bezirk Scheibbs als die faunistisch am besten dokumentierte Klein-Region Mitteleuropas betrachtet werden.

Faunistic work and life of Franz Ressler (born 1924) are recognized. Although he had no higher school education, he studied, only for personal interest, Natural History and Pre-history of the region around his native town Purgstall (Austria inferior, District of Scheibbs). He obtained the necessary scientific knowledge and competence by personal contact with Professional scientists, and he published not only hundreds of papers in scientific journals and in newspapers but also the four volumes on Zoology in the series „Naturkunde des Bezirkes Scheibbs“ (*Natural History of the District of Scheibbs*). This district may be considered the best-studied region in Central Europe from a faunistic point of view, mainly as a result of the life-long work by Franz Ressler.

Univ. - Prof. Dr. HANS MALICKY

**Laudatio zur Auszeichnung mit der
„Ehrenmedaille für herausragende Leistungen auf dem Gebiet der Entomofaunistik“
(In Scientia Entomofaunistica Excellenti)
für JOSEF JELÍNEK
anlässlich des 22. Internationalen Symposiums für Entomofaunistik in Mitteleuropa
(SIEEC XXII) am 29. Juni 2011 in Varaždin (Kroatien)**

Dr. Josef Jelínek wurde am 12. August 1939 in Praha geboren. Seit seiner Studienzeit beschäftigt er sich mit Käfern. So verwundert es nicht, dass er an der Karls-Universität Schüler von Prof. Jan Obenberger wurde. Seine Diplomarbeit (1961) befasste sich bereits mit den Nitidulidae. Später kamen andere Familien der Cucujoidea hinzu, denen auch das Thema seiner Dissertation (1971) galt. Heute ist Josef Jelínek ein weltweit bekannter und gesuchter Spezialist auf diesem schwierigen Gebiet der Koleopterologie und er hat sein umfassendes Wissen in über 120 Originalarbeiten niedergelegt. Von 1961 bis 2004 arbeitete er in der Entomologischen Abteilung des Nationalmuseums, von 1991 bis zu seiner Pensionierung als Chef.

Josef Jelínek hat sich immer darum bemüht, Taxonomie und Faunistik als eine Einheit zu behandeln. Deshalb sind viele seiner Publikationen von grundlegender Bedeutung für die Entomofaunistik Mitteleuropas, z. B. die „Check-list of Czechoslovak Insects IV. (Coleoptera). Seznam československých brouků“ (1993). Er ist Ehrenmitglied und Präsident der Tschechischen Entomologischen Gesellschaft und seit langem Leiter der Sektion Faunistik. In diesen Eigenschaften hat Josef Jelínek sehr viel für die Entwicklung unseres Fachgebietes getan.

Den Internationalen Symposien für die Entomofaunistik in Mitteleuropa (SIEEC) ist Josef Jelínek von Anfang an eng verbunden. Er ist ein stets einsatzbereites Mitglied des Ständigen Organisationskomitees und hat sich immer um das Gedeihen unserer Gemeinschaft bemüht.

Man muss unbedingt erwähnen, dass Josef Jelínek eine sehr vielseitige Persönlichkeit ist. Seine Kenntnisse über Botanik, Kultur und Geschichte sind herausragend, er liebt die Musik, spielt selbst Violine und ist ein begnadeter Kenner der Kochkunst.

Eine unzählbare Fülle von Exkursionen und Expeditionen weisen ihn als hervorragenden Feldentomologen und Sammler aus. Mit diesem Wirken hat er viele Entomologen zu eigenem Wirken angeregt und immer den entomologischen Nachwuchs gefördert, vor allem auch die in ihrer Freizeit nebenberuflich tätigen Entomologen. Die angedeutete Vielseitigkeit und seine stets freundliche und entgegenkommende Ausstrahlung haben diesen wichtigen Teil seines Wirkens beflügelt.

Das Ständige Organisationskomitee möchte mit dieser Auszeichnung Herrn Dr. Josef Jelínek für sein jahrzehntelanges Wirken zur Förderung von Entomofaunistik und Taxonomie danken und ihm gleichzeitig alle guten Wünsche für die Zukunft übermitteln.

Prof. Dr. sc. nat. Dr. rer. nat. h. c. BERNHARD KLAUSNITZER

ABSTRACTS

PLENARY LECTURES

HRVATSKA ENTOMOFAUNA iz sadašnjosti pogled unatrag i planovi za budućnost

Paula Durbešić

Prirodoslovno-matematički fakultet Sveučilišta u Zagrebu, Zagreb, Hrvatska.

Iz povijesti entomološke znanosti u Hrvatskoj kroz minulih 250 godina nekoliko je razdoblja u njezinu uzlaznu razvoju. Od putopisa s kraja 18. stoljeća, preko intenzivnog zanimanja za kukce, pretežno stranaca, a kasnije i domaćih istraživača, izrade prvih zbirki kukaca u Hrvatskoj, do osnivanja muzeja i sveučilišnih ustanova te današnjih znanstvenih istraživanja u institutima i na fakultetima.

U početno vrijeme našu entomofaunu gotovo isključivo istraživali su strani istraživači i entomološki materijal pohranili u svoje domicilne zbirke. I dok su u Europi sistematika i entomofaunistika u 19. stoljeću u punom zamahu, u Hrvatskoj su tek na početku. Na žalost one nikad, ni danas nisu u nas dosegle punu razvijenost. Sveučilišno obrazovani biolozi dvadesetoga stoljeća osim sistematike i faunistike nastoje pratiti novija dostignuća biološke znanosti osobito u molekularnoj biologiji i biokemiji i ići u korak s njima. S ponosom možemo istaknuti naše današnje prirodoslovce svjetskoga glasa kao Miroslava Radmana, Ivana Đikića, Nenada Bana, Igora Štagljara i dr. Unatoč napretku u drugim znanostima ipak se istraživanje faune općenito pa i entomofaune odvija kontinuirano. Radi preglednosti, tih 250 godina podijelili smo na šest razdoblja koja su određena i političkim i društvenim promjenama u Europi pa i u nas i u našem okruženju. Opisani su radovi znanstvenika važnih za svako razdoblje, a osobito domaćih znanstvenika. Ostali su prikazani tabelarno te skupno grafički brojčano.

Ohrabruje činjenica da su i nakon dva svjetska rata muzejske zbirke i neizmjeran bibliotečni materijal ostali sačuvani. Na žalost do danas je entomofauna obrađena samo djelomično. Neki redovi, primjerice Coleoptera, Lepidoptera i Diptera istražuju se intenzivnije, ali o mnogima još nemamo nikakvih spoznaja. Svjesni smo da moramo u tom poslu ustrajati, ali i intenzivirati ga. Pratimo svjetska nastojanja u zaštiti prirode i bioraznolikosti. Uхватili smo korak s europskim i svjetskim nastojanjima na tom području. Marom mnogih entomologa nastojali smo u ovom radu prikazati područje istraživanja, prostor, brojčanu zastupljenost (porodica, rodova, vrsta) procjenu ugroženosti, endemizam i dr. da bi uvid u entomofaunu danas bio jasniji i približno točan. Naveden je broj entomologa u pojedinim institucijama. Spomenuto je pokretanje znanstvenih časopisa, znanstveno-stručnih udruga te sve znatne tiskane knjige. Na kraju su naši planovi za budućnost.

CROATIA'S ENTOMOFAUNA

Looking back from the present and plans for the future

Paula Durbešić

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In the history of the entomological sciences in Croatia, several periods can be recognised over the past 250 years of its development. From the travel records in the late 18th century, to intensive interest in insects and the creation of the first insect collections in Croatia, primarily by foreigners and later by local researchers, to the later establishment of museums and university institutions, through to today's scientific research in various institutes and university faculties.

In the initial period, entomology in Croatia was exclusively studied by foreign researchers, and collected materials were stored in collections in their native countries. While systematics and entomological studies were already in full swing throughout Europe in the 19th century, they were in their infancy in Croatia. Unfortunately, they have never reached full development, not even today. University educated biologists of the 20th century carried out systematic and faunistic studies, and followed and kept up with the most recent achievements of the biological sciences, especially molecular biology and biochemistry. Today we can proudly point out our natural historians of world repute, such as Miroslav Radman, Ivan Đikić, Nenad Ban, Igor Štagljar and others. Despite the progress achieved in other sciences, faunistic studies in general and with respect to entomology have continually developed. For easy reference, we have divided the past 250 years into six periods, determined by political and social changes in Europe, both here and in our surroundings. The works of scientists considered important for each period, particularly those of domestic scientists, are described. The remaining works are outlined in tabular form and their pooled numbers are shown in graphical form.

The fact that our museum collections and vast library materials remained preserved after the two world wars. Unfortunately, the entomofauna of Croatia has only been partially studied to date. Some orders, such as Coleoptera, Lepidoptera and Diptera have been intensively researched, while for many others we have no knowledge at all. We are aware that we must persevere in this task, and intensify our efforts. We are following global efforts to protect our environment and biodiversity. Our efforts in those areas are in line with European and global efforts. We have attempted in this paper to outline the work of many entomologists, to show their focus of study, area of study, representation (families, genera, species), assessed level of threat, endemism, etc. to provide an overview of today's entomology that is clear and accurate. The number of entomologists in individual institutions is given. Mention is made of the launch of scientific journals, scientific and professional associations and significant scientific books. In the end, we outline our plans for the future.

**A 2 Literatur, Biografien, Arten – Die ZOBODAT, das digitale Archiv des
 Biologiezentrums in Linz als naturkundliche Informationsquelle**

Michael Malicky & Fritz Gusenleitner

Biologiezentrum Linz, Linz, Austria.

Seit der Übernahme der ZOBODAT (Zoologisch-Botanische Datenbank) durch das Biologiezentrum der Oberösterreichischen Landesmuseen in Linz wurde die Datenbank nicht nur im Hinblick auf Biodiversitätsdaten ausgebaut. Zusätzlich wurde begonnen digitales Material zur naturkundlichen Literatur und zum Werdegang von Naturwissenschaftler zu sammeln. Über die Homepage des Hauses (www.biologiezentrum.at) und der ZOBODAT (www.zobodat.at) wird die Informationsfülle allen interessierten Personen zugänglich gemacht.

Derzeit stehen ca. 3,4 Millionen Datensätze zur Verbreitung von Pflanzen und Tieren, über 800.000 Seiten digitale Literatur aus Österreich und Biografien oder Teilbiografien von über 10.000 Personen zur Verfügung.

Anhand von ausgewählten Beispielen wollen wir die Möglichkeiten unseres digitalen Archivs erläutern und einen Ausblick auf die Pläne der nächsten Jahre geben.

**Literature, Biographies, Species – ZOBODAT, the digital archive of the Biology Centre
in Linz, an information source for people interested in natural history.**

Michael Malicky & Fritz Gusenleitner

Biology Center Linz, Linz, Austria.

Since ZOBODAT (Zoological-Botanical Database) has been incorporated by the Biology Center of the Upper Austrian State Museums in Linz we targeted on digitizing more than classical biodiversity data. Literature from Austria within the current borders and biographies from people interested in natural history have been digitised on a large scale. The information is available at www.biologiezentrum.at or www.zobodat.at for the general public.

Until now 3,4 Million data concerning biodiversity, more than 800.000 pages of literature und over 10.000 biographies are available.

We will explain the functionality of our information portals and give a short outlook on our digitisation plans for the near future.

A3 Biogeography of European Aquatic Insects –Insights from Molecular Systematic and Phylogeographic Case Studies

Steffen U. Pauls

Biodiversity and Climate Research Centre (BiK-F), Frankfurt am Main, Germany.

The rise of molecular methods has greatly advanced biogeographic inference. This is also true for the biogeography of European aquatic insects, where an increasing number of molecular systematic and phylogeographic studies are available to test long-standing biogeographic hypotheses. Other biogeographic ideas, e.g. the “refugia within refugia” hypothesis, have been founded on molecular studies and are becoming paradigms in European biogeography. I will discuss case studies on aquatic insects that illustrate the value of molecular studies in addressing biogeographic questions. Aquatic species often exhibit different phylogeographic patterns than terrestrial species, reflecting their very different life histories and varied responses to past environmental change. Due to the limited number of molecular studies to date, it is unclear if there are common phylogeographic histories of aquatic invertebrates as has been shown for terrestrial species. Combining species distribution modeling with molecular tools is an interesting development that will further promote integrative analysis of species distributions with phylogenetic and phylogeographic history to infer aquatic insect biogeography in Europe.

ABSTRACTS

ORAL PRESENTATIONS

A4 Prikupljanje i centraliziranje podataka o biološkoj raznolikosti Hrvatske kroz uspostavu jedinstvene faunističke baze *CRO-fauna* kao dijela Nacionalnog informacijskog sustava zaštite prirode te *Projekt integracije u EU Natura 2000 (NIP)*

Gathering and centralizing the data on biodiversity of Croatia through the development of faunistic database *CRO Fauna*, as part of Nature Protection Information System (NPIS), and *EU Natura 2000 Integration Project (NIP)*

Luka Katušić, Marin Grgurev, Ivana Plavac & Davorin Marković

Državni zavod za zaštitu prirode, Zagreb, Croatia.

Iako je o pojedinim sastavnicama biološke raznolikosti Hrvatske prikupljena velika količina podataka unatrag stotinjak godina, u Republici Hrvatskoj inventarizacija biološke raznolikosti nikada nije sustavno napravljena, a postojeći podaci većinom nisu uneseni u strukturirane baza podataka te su kao takvi nedostupni ili se uopće ne zna da postoje. Velik dio podataka neplanski je i nesustavno sakupljan te danas ima uglavnom povijesnu, ali ne i analitičku vrijednost.

Početak 2011. godine Državni zavod za zaštitu prirode započinje provedbu projekta „*Uspostava faunističke i speleološke baze podataka kao dijela Nacionalnog informacijskog sustava zaštite prirode*“ (IPA 2007 komponenta i TAIB/TAF). Cilj projekta je poboljšanje organizacije, pohrane i pristupa podacima o biološkoj raznolikosti te speleološkim/biospeleološkim podacima u svrhu učinkovite primjene Nature 2000. Razvojem jedinstvene stručno – znanstvene faunističke baze omogućilo bi se stručnoj i znanstvenoj javnosti unošenje, pohrana te pregledavanje svih potrebnih podataka o biološkoj raznolikosti, za čiju sigurnost i točnost jamči Republika Hrvatska, uz osiguravanje autorskih i prava korištenja podataka. Prvi kontakti sa stručnjacima za različite taksonomske skupine te prikupljanje informacija o načinu bilježenja podataka i definiranju potrebnih stavki unutar baze podataka za pojedine skupine uspostavljeni su još 2006. i 2007. godine. Na osnovu ovog konzultacijskog procesa izrađen je nacrt strukture CRO-fauna baze podataka, koja će biti uspostavljena početkom 2012. godine.

U sklopu odobrenog zajma Svjetske banke (IBRD 8021-HR), ratificiranog Zakonom o potvrđivanju ugovora o zajmu (NN MU 7/2011 od 18. svibnja 2011.) započela je provedba još jednog važnog projekta „*Projekt integracije u EU Natura 2000*“ (NIP), čiji je nositelj Ministarstvo kulture. Njegovo trajanje je 5 godina, a uz aktivnosti ulaganja u ekološku mrežu te jačanje kapaciteta za upravljanje ekološkom mrežom, najveći dio projekta bit će usmjeren na planiranje, utvrđivanje prioriteta te sustavnu inventarizaciju biološke raznolikosti radi dopunjavanja informacijskog sustava zaštite prirode, a s ciljem ispunjavanja zahtjeva EU za izvještavanjem. Ovaj dio projekta, koordiniran od strane Državnog zavoda za zaštitu prirode, uključivat će prikupljanje i obradu postojećih inventarizacijskih podataka (literatura, zbirke, studije, izvještaji i dr.) od relevantnih stručnjaka za pojedine taksonomske skupine. Temeljem rezultata obrade prikupljenih podataka uslijediti će provođenje sustavne inventarizacije prioritarnih taksonomskih

skupina i geografskih područja kao i kartiranje stanišnih tipova RH u mjerilu 1:25000. Na ovaj način velika većina postojećih podataka o biološkoj raznolikosti Hrvatske prikupila bi se na jednom mjestu te unijela u jedinstveni Informacijski sustav zaštite prirode, koji bi se naposljetku povezoao s drugim relevantnim informacijskim sustavima Republike Hrvatske s ciljem učinkovite razmjene podataka o svim sastavnicama biološke raznolikosti. Na temelju dobivenih podataka odredilo bi se početno stanje i trend svojiti i staništa - polazište za buduće praćenje promjena pojedinih svojiti, staništa ili pak ekoloških sustava u cjelini.

A 5 Convergent evolution of albinism in cave adapted plant hoppers

Helena Bilandžija¹, Helena Četković¹ & William R. Jeffery^{1,2}

1: Laboratory for molecular genetics, Ruđer Bošković Institute, Zagreb, Croatia; 2: Department of Biology, University of Maryland, College Park, USA.

Cave adapted animals are often characterized by the reduction or absence of melanin pigment, a condition known as albinism. Here we ask whether albinism has evolved by the same or different changes in the melanin biosynthesis pathway in two albino cave cixiid planthoppers, one from limestone caves in Mljet and Biokovo, Croatia (undescribed species) and the other from lava tubes in Hawaii (*Oliarus polyphemus*). We have developed a functional assay for detecting the position of a block in the melanin biosynthesis pathway by supplying exogenous substrates, such as L-tyrosine or L-DOPA, to lightly fixed specimens, and subsequently detecting melanin as deposits of black pigment. Supplying exogenous L-DOPA but not L-tyrosine produced black pigment in both species of cixiids, implying that a defect occurs in the first step of the melanin biosynthesis pathway in two independently evolved planthopper cave lineages. The deposition of melanin pigment is blocked by prior treatment of the specimens with high temperature (which denatures proteins) or co-assay with phenylthiourea (an inhibitor of tyrosinase) indicating that the reaction is enzyme-catalyzed. The only case in which the cause of albinism is already known in a cave organism is in *Astyanax mexicanus* cavefish. In this species the *oca2* gene, which acts during the initial step of melanin biosynthesis, the conversion of L-tyrosine to L-DOPA, is mutated. Therefore, albinism has evolved via convergent evolution by interfering with the same initial step of the melanin biosynthesis pathway in both cave-adapted insects and fishes. We are currently investigating the possibility that this convergence is even broader than described here by conducting the melanogenesis substrate assays in many different albino invertebrate species.

A 6 New molecular markers for deep phylogeny of Coleoptera: a bioinformatic approach

Branka Bruvo Mađarić¹, Željka Pezer¹, Joan Pons² & Đurđica Ugarković¹

1: Molecular Biology Division, Rudjer Bošković Institute, Zagreb, Croatia; 2: Molecular Systematics Lab, Mediterranean Institute for Advanced Studies, Esporles, Balearic Islands, Spain.

Coleoptera (beetles), with about 400 000 currently described species, is the largest order in animal kingdom. Beetles are present in almost all ecosystems; many species are important bioregulators, and large number of taxa is of great economical significance. According to current systematics, beetles are classified in 4 extant and 7 extinct suborders, but, due to ancient speciation events, phylogenetic relationships between and within these groups could in so far not be unequivocally clarified by the use of morphological characters and/or common molecular markers.

In our project we intend to develop new conserved molecular markers that would be informative in resolving deep nodes in phylogenetic tree of Coleoptera. Based on completely sequenced genomes of the red flour beetle (*Tribolium castaneum*) and several other endopterygote insects, we use bioinformatic approach to select orthologous nuclear protein-coding genes, determine conserved regions, and construct primer-pairs for their amplification. Genomic DNAs of representative beetle species are used for amplification of selected regions, and specific PCR products are sequenced and aligned. Phylogenetic analyses are conducted by various methods (ML, MP, Bayesian), topologies of the resulting trees are inspected, and the value of particular gene regions assessed in contributing new phylogenetic information in Coleoptera.

A 7 Ant communities in Croatian basophilous fens

Jelena Bujan¹, Andreja Brigić², Renata Šoštarić³ & Zorana Sedlar³

1: Croatian Myrmecological Society, Zagreb, Croatia; 2: Department of Zoology, Faculty of Science, University of Zagreb, Zagreb, Croatia; 3: Department of Botany, Faculty of Science, University of Zagreb, Zagreb, Croatia.

The research of ant fauna was carried out using pitfall traps in two Croatian basophilous fens Plaški and Jarak in 2008. Additionally, ant fauna of adjacent habitats in different succession stages was also studied in the Jarak fen. A total of 715 specimens of 20 ant species were collected. Species richness, abundance and diversity were the highest at the Plaški fen, most likely due to the fen size and diversity of microhabitats. True tyrphobiontic species, such as *Formica picea* and *F. uralensis* were not recorded in the current study. Tyrphophilous species *Myrmica scabrinodis* was found only in the Plaški fen. Cluster analysis showed low degree of similarity between ant fen fauna, mainly due to the isolation, fen size, water table depth and vegetation composition.

At Jarak fen the ant abundance was higher in succession stages compared to the fen site itself whereas species richness varied between the two succession stages. Furthermore,

the highest number of species and individuals was recorded at transitional succession stage of common reed (*Phragmites australis*) and initial forest stages. *Myrmica rubra* and *Lasius platythorax* were the dominant species, both at fen and at succession stage dominated by *Phragmites* sp. Absence of other ant communities in the fen is most likely caused by lack of nesting sites due to specific vegetation composition and particularly high water table. Cluster analysis confirmed that ant fen communities were well separated from forest communities, with very few overlaps in terms of species composition. However, the degree of similarity between the ant fen community and communities established along the succession gradient was remarkably high. It appears that ant fauna of the paleoregional habitat islands is impoverished and that these areas represent rather extreme environment for ants.

A 8 The first atlas of European dragonflies and damselflies (Odonata)

Klaas-Douwe B. Dijkstra¹, Vincent J. Kalkman¹ & Jean-Pierre Boudot²

1: Netherlands Centre for Biodiversity Naturalis, Leiden, The Netherlands; 2: LIMOS, CNRS, UMR 7137, Université Henri Poincaré Nancy I, Faculté des Sciences, Vandoeuvre-lès-Nancy Cedex, France.

The book, edited by V.J. Kalkman and J.-P. Boudot, but with close to 50 contributors, will give an overview of the distribution (50x50 km squares) and flight period of all 138 European odonate species. Short introductory chapters on the database and maps, as well as on taxonomy, biogeography, life history and conservation will also be included. The publication should appear in late 2012. In the presentation, the project will be introduced and the first results shown.

A 9 Does spatial and temporal distribution of records enable production of Atlas of dragonflies (Odonata) of Croatia?

Matija Franković¹, Tomislav Bogdanović² & Robert Španić¹

1: Institute for Research and Development of Sustainable Eco Systems, Novo Čiče, Velika Gorica, Croatia; 2: Department of Biology, University of J. J. Strossmayer, Osijek, Croatia.

During the production of Red Data Book of Dragonflies of Croatia first insight was made into a national spatial and temporal distribution of both published and unpublished records on dragonflies. For that purpose data were organized in privately owned Croatian Odonata Database (CROD). Recently data contained in CROD were shared for the newly published 50x50 km grid based Dragonfly Atlas of Mediterranean. Since then, new published as well as unpublished data were collected and the database is under the process of reorganization thus allowing more detailed analysis and synthesis of spatial and temporal distribution of dragonfly species on Croatian territory. The main aim of this analysis was to provide insight into the spatial and temporal distribution of

published, as well as the author's unpublished records of dragonflies of Croatia. As more than 60% of 10x10 km grid squares does not contain any of dragonfly records whatsoever, presented analysis revealed quite a few regions in Croatia with sufficient amount of data for production of detailed Atlas of Dragonflies. Along with poor data concerning spatial and temporal distribution of dragonflies, older published records will be detailed revised. Furthermore, potential regions will be discussed as areas in which future odonatological research has to be primarily oriented and proposed in order to fill spatial gaps in knowledge of dragonfly distribution.

A 10 Netless filter-feeding caddisflies in Europe

Wolfram Graf¹, Ana Previšić², Mladen Kučinić², Steffen U. Pauls³ & Johann Waringer⁴

1: Institute of Hydrobiology and Aquatic Ecology Management, University of Natural Resources and Life Sciences, Vienna, Austria; 2: Department of Biology, Faculty of Science, University of Zagreb, Zagreb, Croatia; 3: Biodiversity and Climate Research Centre (BiK-F), Frankfurt am Main, Germany. 4: Department of Limnology, University of Vienna, Austria.

According to our present knowledge, European benthic filter feeders have evolved only in the insect groups of Ephemeroptera, Trichoptera and Diptera. Caddisflies have refined these techniques by net-spinning as shown by most families of Hydropsychoidea (Hydropsychidae, Ecnomidae and Polycentropodidae) as well as in Philopotamidae; in addition, genera *Allogamus*, *Brachycentrus* and *Drusus* developed extraordinary sets of filtering bristles at femora, heads and sometimes sterna, sometimes combined with elongations of femora or with strange head morphologies. Dipterans use nets like genus *Rheotanytarsus* or a modified labrum with retractable head fans as in Simuliidae. This presentation focuses on the importance of filtering species among netless larvae of Trichoptera within stream communities.

Within Brachycentridae only genus *Brachycentrus* has evolved bristles originating from elongated femora for optimizing filtering while the second genus *Micrasema* feeds on mosses and fine detritus and consequently shows no adaptations at all. Most limnephilids are shredding omnivores (with the exception of some grazers like *Melampophylax*) but the genus *Drusus* has developed a remarkable radiation in feeding types (grazers, shredders and filter feeders). As a genus should represent both an ecotype and a morphotype, these findings have important taxonomic consequences.

In contradiction to the River Continuum Concept netless filter feeders among caddisflies cover the crenal parts of high altitude mountains from 2000 m a.s.l. down to epi- and metapotamal lowland rivers at 200 m a.s.l. in high densities. This phenomenon seems to be a European peculiarity as no netless filtering species of caddisflies are known in North America except family Brachycentridae (Wiggins, 1996). In Asia the genus *Limnocentropus* takes the role of filtering *Drusus* species and occupies a similar niche at high-current microhabitats of torrents. Its general morphology shows strong analogies to *Drusus* and *Cryptothrix*.

A 11 *Harmonia axyridis* Pallas – Asian lady beetle – a new fauna member in Croatia

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Asian lady beetle *Harmonia axyridis* Pallas was introduced in USA and Canada at the beginning of the last century. In 1995, it was introduced in Europe as a biological tool to control aphids. Nowadays, insect is distributed in the most European countries. In 2010, for the first time it was recorded on currant, gooseberry, nettles and wild cherry in Croatia, Ratkovica (Pleternica). In fall 2010, it was recorded in Kutjevo area, in vineyards, as well as in households in area of Semeljci in populations with great abundances. *Harmonia axyridis* is characterized by great polymorphism. Insect body shape is oval and measure from 6 to 8 mm in length. The pronotum is black with a M or W shaped mark. The colour of elytrae and number of spots varies from 0 to 22. Three colours are dominated: red, yellow and yellow-orange, and black with red spots. The legs are usually brown or reddish. They predate on aphids, but also can feed on larvae of other ladybirds. It can be found on mature fruits and grapes. Infected clusters of grapes should be segregated while processing, otherwise wine decreases its quality because of the presence of alkaloids. While overwintering, they tend to group, and this is one of the leading characteristics indicating this species since other lady beetle do not group. Often, they are household nuisance, and can cause allergies. It is important to stop using this insect species as biological control option. Integrated pest management is advised in control of multicoloured Asian lady beetle, such as mechanical measures, natural enemies and predators. Chemical measures should be avoided because of the detrimental effect on other useful lady beetle.

A 12 Microhabitat preference and emergence patterns of Diptera (excluding Chironomidae) in the springs of Bijela rijeka and Crna rijeka, NP Plitvice

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Larval composition and emergence patterns of Diptera (excluding Chironomidae) were studied in the springs of Bijela rijeka and Crna rijeka in the Plitvice Lakes National Park. Samples of the larvae were taken monthly during 2007 using Surber sampler from all present substrates. Six pyramid-type emergence traps were placed on each site on different substrate types and samples were collected monthly through 2007. Overall, at both investigated sites species from 14 families were recorded. At spring of Bijela rijeka 13 species were found in Surber samples, whereas 20 species were identified from emergence traps. Similarly, at spring of Crna rijeka larvae of 14 species were collected, while 28 species were identified from emergence trap samples. Family Limoniidae was

represented with 5 and 12 species at the spring of Bijela rijeka and Crna rijeka, respectively, followed by Empididae represented with 6 species at both springs. *Berdeniella* sp. nov. (Psychodidae) was overall the most abundant species regarding both number of larvae and adults collected. Diversity and number of collected specimens were higher for the spring of the river Bijela rijeka, considering both sampling types (larvae and adults collected with emergence traps). *One-way* ANOVA showed that *Berdeniella* sp. nov. (Psychodidae) preferred moss as larval habitat at both sites and also its emergence from that substrate was highest. Larvae of *Dicranomyia didyma* (Limoniidae) preferred sand while adults did not show any preference towards emerging from particular substrate type. Differences in number of specimens and Diptera species at these two springs can be contributed to the differences in their canopy, because spring of Bijela rijeka has an open canopy while the canopy at spring of Crna rijeka is closed.

A 13 One genus and three species of ants (Hymenoptera: Formicidae) new for Croatia

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Three new species and one new genus of ants have been recently recorded for Croatia. The species are *Camponotus tergestinus* Müller, 1921, *Lasius citrinus* Emery, 1922 and *Proformica* cf. *nitida*. Kuznetsov-Ugamsky, 1923. Finding of the latter represents not just the first record of the genus *Proformica* Ruzsky, 1902 for Croatia but also for a broader area of neighbouring countries because the next nearest known localities of the genus are in Bulgaria. Biology, taxonomic history and distribution are presented for all three species. The number of recorded species known for Croatia is still far from the number expected by authors.

A 14 *Xylosandrus germanus* (Blandfort, 1894) (Curculionidae: Scolytinae) in Slovenia

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The presence and spread of ambrosia-beetle *Xylosandrus germanus* in Slovenia has been researched. So far, it has been recorded in six locations in Slovenia. The first record of this beetle originates from Solkan, near Nova Gorica on April 26, 2000, on *Castanea sativa*. In the following years, within the national monitoring program of *Monochamus* species as vectors of *Bursaphelenchus xylophilus* from the year 2008 to 2010, other taxa

were checked *inter alia* for the presence of *X. germanus*. The monitoring was done on eight locations in stands of *Pinus nigra*, *P. sylvestris*, *P. halepensis*, *Picea abies* and *Abies alba*. The samples were collected during the growing season in one-month intervals using crossvane funnel traps (four traps/location) by means of a wet collecting cup baited with various lures (ethanol and α -pinene, "Pheroprax" and "Gallowit"). In 2008 *X. germanus* was recorded on two locations (Brdo, Zgornje Bitnje) in the stand of *Pinus sylvestris* on July 16, and August 13, in traps with a mixture of ethanol and α -pinene and commercial lure "Gallowit". Between June and September 2010, the species was found in Podpeč in the stands of *Abies alba* in traps with ethanol and α -pinene. On May 31, 2009, *X. germanus* was found in the stem of *Abies alba* in natural reserve Mali Plac near Ljubljana. In May 2010, it was discovered on younger chestnut trees near Nova Gorica. The increased number of sites where the beetle is appearing in recent years, and the increased number of beetles caught in traps suggest that this non-native bark beetle has successfully established and spread in Slovenia and may start to cause economic damage in the future.

A 15 How much do we know about Croatian spiders? – Historical overview of the publications

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As it is the case with most groups of invertebrates, the spider fauna of Croatia is still poorly known, and the publications on the spider fauna of Croatia are scarce. It is assumed that, from the first written record by a foreign author in the year 1774 until today, around 300 publications concerning Croatian spider fauna were published. Here we present the results of short analysis of the literature reference list, which has been conducted in order to track the research interest for the spiders in Croatia through history and to determine the ratio of publications by Croatian authors in the processed literature list. The analysis included a list of 220 titles that we know to contain any kind of data on the spider fauna of Croatia. Analysis of this list showed that the largest number of publications was published in the second half of the 20th century, while the least productive period of Croatian arachnology was since the end of World War I until the 1960ies. The publications by Croatian authors are considerably less represented than the ones by the foreign researchers, and only in the early 21st century, the number of works by Croatian authors concerning spiders reaches the number from the end of the 19th century. Within this analysis, a brief overview of the work of our most important researchers of the world of spiders is given.

A 16 Bewertung der ungarischen Wanzen (Insecta, Heteroptera) aus Naturschutzaspekt

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Obwohl mehrere Wanzenarten in Ungarn gesetzlich geschützt sind, waren die nicht aus wissenschaftlichen Gründen ausgewählt. Ziel dieser Forschung ist die Ausarbeitung eines Systems, das bei der späteren Erklärung der geschützten Arten hilft, beziehungsweise den „Naturschutzwert“ der ungarischen Wanzenarten festzustellen. Der Naturschutzwert wird aus verschiedenen quantifizierten Komponenten zusammengestellt. I. Die Gefährdung der Arten. Das ist ein komplexer Faktor: Geographische Verbreitung (1-3): keine endemische Wanzenarten, von paläarktischen (1) bis mitteleuropäischen Arten (3); ein weiterer Punkt zu Marginalpopulationen (+1). Spezialisierung auf Nahrung (0-3): von sehr polyphagen Arten (0) bis Monophagie an seltene Pflanzen- oder Insektenarten (3). Flugfähigkeit (0-1): wichtig für (re)Kolonisierung; nur jene Arten bekommen ein Punkt, dessen Weibchen niemals flugfähig sind. Seltenheit (1-5): die Seltenheit ist im Zusammenhang mit den genannten Faktoren, hängt aber auch von anderen Faktoren ab, wie z.B. Biotopspezialisierung, Häufigkeit ihrer Habitate in Ungarn, Fruchtbarkeit usw., die wir manchmal nicht kennen oder nicht quantifizieren können. Die anderen Faktoren des Naturschutzwerts sind: II. Nativität (-5 – 0): Einheimische Arten bekommen kein Punkt; adventive Arten mit rezenten Arealerweiterung -2; aus anderen Kontinenten eingeschleppte Arten -5: die letztgenannten Arten können einheimische Arten gefährden. III. Leichte Bestimmung (0-2): wenn eine Art nur Spezialisten bestimmen können, lohnt es sich nicht diese geschützt zu erklären. IV. Dekorativität (0-1): auffällige Arten sind besser für Naturschutz, weil die Fachleute und auch Nichtfachleute sie leichter erlernen und erkennen können. Aufgrund der oben genannten Kriterien können die ungarischen Wanzenarten einen Wert zwischen -3 und 15 bekommen. Von den 861 bewerteten Arten haben 19 Arten 12 oder 13 Punkte bekommen, aber von den 4 geschützten Arten hat nur eine Art (*Phyllomorpha laciniata*) 12 Punkte bekommen. Von den genannten 19 Arten sind auf Grund von mehreren Kriterien mindestens 2 Arten (*Bagrada stolidus* und *Sternodontus obtusus*) für gesetzlichen Schutz empfiehlt.

Evaluation of true bugs of Hungary from nature conservation aspect

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Although a number of bug species (Insecta: Hemiptera) in Hungary are protected by law, they were not selected for scientific reasons. The goal of this research is to develop a system that helps in the subsequent declaration of protected species i.e. to determine

the "conservation value" of the Hungarian bug species. The nature conservation value consists of various quantified components. I. The threat of the species; this is a complex factor: 1. Geographic distribution (1-3): no endemic bug species in Hungary; from Palearctic (1) to Central European species (3), one further point to marginal populations (+1). 2. Specialization in diet (0-3), from very polyphagous species (0) to monophagous species feeding on rare plant or insect species (3). 3. Flight capability (0-1): important for (re)colonization, only species with females not capable to fly are scored. 4. Rarity (1-5): the rarity is connected with the above factors, also depends on other factors such as habitat specialization, or abundance of their habitat in Hungary, fertility, etc., together, we sometimes do not know or cannot quantify. Additional factors of nature conservation value are: II. Nativity (-5 - 0): Native species get no points; adventive species with recent range extension -2; introduced species from other continents -5: the latter species can threaten native species. III. Easy identification (0-2): If only specialists can identify a species, it is not appropriate to be listed for conservation. IV. Decorativeness (0-1): conspicuous species are better for nature conservation, because the experts and the audience can learn to recognize them easily. Accordingly, the Hungarian bug species have a value between -3 and 15. Of the 861 species assessed 19 species have received 12 or 13 points, but among the four protected species only one has 12 points (*Phyllomorpha laciniata*). Furthermore, at least two species are suggested to be by protected by law (*Bagrada stolidus* and *Sternodontus obtusus*).

A 17 Contribution to the knowledge of lady-birds (Coleoptera, Coccinellidae) of Croatia

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The ladybirds (Coccinellidae) are one of the most beautiful and colourful coleopteran families due to their vivid coloration and dotted wings. The research of ladybirds of Croatia started more than 100 years ago, but in the last few decades only a handful of papers were published. Until this day no systematic list of species present in Croatia exists, so it cannot be said that the lady bird fauna of Croatia is sufficiently known. In this poster communication we present new records for 23 ladybird species collected during the last 4 years across Croatia. We also present the first preliminary checklist of ladybirds of Croatia consisting of 77 species. New data about the presence of invasive species, *Harmonia axyridis* (Pallas 1773) are also given.

A 18 Blackflies from the *Simulium reptans* group (Diptera: Simuliidae) in Central Europe

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Traditionally, four species from the *Simulium reptans* (Linnaeus, 1758) group have been distinguished in Central Europe: *S. reptans*, *S. galeratum* Edwards, 1920, *S. colombaschense* (Scopoli, 1780) and *S. voilense* Sherban, 1960; however the identity, morphology and distribution of none of them is clear and without ambiguities. We analysed the genetic structure of the populations of *S. reptans* and *S. galeratum* with respect to the basic genetic variability and haplotype number and distribution between species and among populations within species. The study is based on the analyses of the CO1 gene (primers LCO, HCO), the analysed section has a length of 606 bp. As previously found in Great Britain, also in Central Europe both species are genetically isolated from each other, which has been supported by the results of AMOVA. In Central Europe as well as in Britain two groups of close but distinct haplotypes (A and B) were found within *S. reptans*. Similarly, within *S. galeratum* two distinct groups have also been identified, however they are not equally distributed: the populations from Slovakia and Baltic states are very close to each other, but rather distinct from the British populations, whereas in Sweden haplotypes close to both these groups are present. The populations identified as *S. galeratum* seem to correspond to the species originally described as *S. reptans*, thus the previous synonymisation of *S. galeratum* with *S. reptans* has been confirmed indirectly, and the identity of the populations recently identified as *S. reptans* is not known.

A 19 Unser derzeitiger Kenntniss über die Zwergwasserkäfer (Coleoptera: Hydraenidae) in Ungarn

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Von den in Ungarn vorkommenden Wasserkäfern sind die Zwergwasserkäfer die kleinsten mit der Länge von 1-2.5 mm. Die Familie ist eine der am wenigsten untersuchten Gruppen unter den Wasserkäfern. Die meisten Arten der Familie sind Bewohner der Fließgewässer, nur ein kleiner Teil lebt in stehenden Gewässern. Viele Arten haben eine starke Bindung an ihren Lebensraum und die Flugfähigkeit ist sehr schwach entwickelt, deswegen sind viele Arten gefährdet. Sie gelten daher als ausgezeichnete Indikatoren für Gewässergüte und Gewässertypologie. In Ungarn kommen von vier Gattungen 37 Arten und eine Unterart vor, was im Vergleich mit den umliegenden Ländern wenig ist. Ein weiteres Problem ist, dass die meisten Literaturdaten mehr als 50 Jahre alt sind und in den letzten Jahrzehnten viele

taxonomische Veränderungen durchgeführt wurden. Infolgedessen soll dieses Material revidiert werden. Das vom Sebestyén Endrődy-Younga im Jahre 1967 erschienene Bestimmungsbuch für die Familienreihe Hydrophilidae, zu der damals auch die Zwergwasserkäfer gehörten, ist heute zur Bestimmung der Arten nicht geeignet, und es gibt auch keine umfassende ausländische Literatur. Auch in den letzten Jahren sind taxonomische Änderungen dazugekommen. So zum Beispiel, im Jahre 2008 bei der Revision der Art *Ochthebius viridis* Peyron, 1858, hat sich herausgestellt, dass eine neu beschriebene Art, *Ochthebius bernhardi* Jäch et Delgado, 2008 in Ungarn lebt, und nicht wie bisher gedacht *O. viridis*.

The present knowledge of Minute Moss Beetles (Coleoptera: Hydraenidae) in Hungary

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Among water beetles which occur in Hungary the Minute Moss Beetles are the smallest ones (1-2.5 mm), and therefore within the least studied families. Most of the representatives of the Hydraenidae live in running water in specific habitats due to their restricted ability of the dispersion. In addition, many hydraenids are vulnerable and therefore good bio-indicators for habitat they live in. So far, 37 species and one subspecies of Hydraenidae were estimated in Hungary, what is a quite low number in comparison with neighbouring countries. Also, old records of Hydraenidae need revision as taxonomic changes have taken place in the last 50 years. The monograph on the Hydrophilidae published by Sebestyén Endrődy-Younga in 1967, encompassing the Hydraenidae at that time, is now not appropriate for species identification, especially for representatives that live in Carpathian Basin. Recently family Hydraenidae has undergone major revisions, and is subject to changes even today. For example, in 2008, the revision of species *Ochthebius viridis* Peyron, 1858 has resulted in newly described species, *Ochthebius bernhardi* Jäch et Delgado, 2008. Therefore, we expect that total number of species of Hydraenidae in Hungary will change in the future.

A 20 *Aedes albopictus* - invasive mosquito species in Croatia

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Asian tiger mosquito *Aedes albopictus* (Diptera, Culicidae) is invasive species which has been spreading throughout the world in last three decades. The vector has been introduced in several European countries since 1975. The first record in Croatia

originates from Zagreb. A total of 13 larvae were collected on October 28, 2004 in a discarded ceramic toilet bowl in nearby forest. In the beginning of 2005, specimens of this species were found in Rovinj, Zadar, Split and Dubrovnik. From September to October 2005, some specimens were detected in several places in Istrian peninsula. As it has been present in Italy for the preceding 15 years, its spread to Croatia was expected. Studies in Istria show the presence of this species in eight towns: Pula, Rovinj, Funtana, Poreč, Novigrad, Buje, Umag and Savudrija. The mosquito larvae were found only in man-made breeding sites such as water reservoirs, discarded car tires and various water collecting objects. Spread of *Ae. albopictus* on Croatian islands in recent years shows that antropochory of this species is very fast. Since 2006, the following islands were inhabited by *Ae. albopictus*: Vis, Hvar, Brač, Korčula, Mljet, Cres, Lošinj and Krk. All findings on islands were close to marinas or surrounding area. Approximately 80.000 yachts cruise in Croatian part of the Adriatic Sea. Causes and models of the *Ae. albopictus* spread are discussed in the presentation. Special attention is given on the yacht vessels and their role in *Ae. albopictus* spread from Italy. In August 2010, a DENV infection was diagnosed in a German traveler returning from a trip to Croatia in Southeast Europe. Two additional cases were noted 2 months later, which makes a total of three autochthonous cases of Dengue in Croatia. These vector-borne diseases are closely connected with *Ae. albopictus* as their vector. However, no virus was isolated from mosquitoes from south Dalmatia so far.

A 21 Web-spinning sawflies *Cephalcia* spp. (Hymenoptera, Pamphiliidae) in the Northern Slovenia: epidemic density and population dynamics prediction

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In July 2009, the first local outbreak of web-spinning sawflies (*Cephalcia* spp.) was recorded in the northern part of Slovenia, near the border with Austria in a 60–90-year-old stand of Norway spruce (*Picea abies* (L.) Karst). Before the attack, the stand was in good condition, on a northern slope with an inclination of 20%, 600–800 meters a. s. l., with more than 70% share of *P. abies* in growing stock. In 2009, the damaged area amounted 40 ha, but by 2010, it increased to 106 ha. In the autumn of 2009, 33 sample plots were set within the most affected area to measure stand attributes (DBH, defoliation, vitality, social status, visible damages, size and length of the crown). The measurements were repeated in autumn 2010. Within this area, six plots were set for temperature measurements of the soil at a 15 cm depth. The average defoliation on the sample plots was 28% (autumn 2009) and 31% (autumn 2010).

As a sanitary measure, in 2010, local foresters attached two types of sticky barrier belts: green and white sticky traps on 7,520 trees at breast height. The average catch of emerging sawflies on green traps was 50.9 adults per one meter of circumference, and only 1.19 adults per one meter on white ones. Six spruces were felled within the treated

plot because of the spruce bark beetle attack. In March 2011, sawfly prepupae on 33 plots were collected. The average abundance was 240 sawflies per one square meter of soil. The impact of climatic and soil factors on the development of the species will be assessed with the use of regression analysis. Furthermore, a prediction of the spatial spread and economic impact of *Cephalcia* species in the year 2011 will be calculated.

A 22 Geometrid moths of Croatia: diversity, biogeography and future activities

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A number of geometrids recorded in Croatia is nearly 450, representing about 45 % of the overall European geometrid fauna, on approximately 0.55 % of the total European territory. Data on diversity is gathered of records from published papers, data from collections of Croatian museums and unpublished field research data. The total number of geometrids of Croatia is not definitive because of a missing data from several museums and private collections across Europe. In addition, an exact distribution and conservation status of geometrids is insufficiently known because Croatia has not been equally and systematically surveyed. Biogeographical features of geometrids of Croatia and status of several species is discussed. Based only on inclusion on Annex II & IV of the EU Habitats Directive, just *Erannis ankeraria* (Staudinger, 1861) is legally protected in Croatia in the category of strictly protected taxa. Future activities regarding geometrids should focus on encouraging long-term geometrid moths' research in Croatia and an active involvement in global activities focused on research of this species-rich family.

A 23 Morphological and genetical characterization in *Praon dorsale-yomenae* group (Hymenoptera: Braconidae: Aphidiinae): preliminary research

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In our research we identified 346 specimens of parasitoid fauna from *Praon dorsale-yomenae* species complex, collected during 1959-2010 in many different localities throughout Palearctic. The occurrence of three species was confirmed: *Praon dorsale* (Haliday, 1833), *Praon longicorne* Marshall, 1891 and *Praon yomenae* Takada, 1968. The *Praon* species presented in this work have been identified from 20 aphid taxa occurring on 33 plant taxa. We presented 42 original parasitoid-host aphid-host plant associations. Because of biological complexity of "*dorsale-yomenae*" group, we will use integrative approach with using of wider range of methods (both morphological and

genetic analysis) for detailed reconstruction of phylogenetic relationship among *Praon* species.

A 24 Coprophagous and coprophilous beetles (Coleoptera) of Biokovo Mt. (Dalmatia, Croatia)

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Obligate coprophagous organisms use excrements of ruminants (Ruminantia) and odd-toed ungulates (Perissodactyla) for development of larvae, as a food and residency. By burying and consuming dung they improve soil structure, spread plant seed, remove pest sources and decrease vectors, especially flies (Diptera). Several projects of coprophagous beetle's introduction, from Europe and Africa into Australia were performed as an environmental improvement measure. Coprophagous (dung) beetles act as an important biodiversity segment, at the same time being suitable ecological indicators. Because of the use of ephemeral substrate, their occurrence is short-lived and occasional; they can rapidly show ecosystem degradation. Their disappearance indicates lack of cattle in ecosystems, followed by degradation of grasslands, further succession, consequently decreasing the species number of many plants, fungi and invertebrates.

Biokovo is selected as vascular plant and invertebrate biodiversity *hot spot* and Nature Park protected area, where inventorying of biodiversity is necessary as a measure for its protection. Literature references were thoroughly studied and collected beetle fauna from the first author collection served as a basis for the research. During the field work in 2010, exact locations were assessed, dung type detected, coprophagous and coprophilous organism's collected, ecological measurements of the substrate performed, localities and beetles documented, and incubation of the biological samples done. In total, 25 taxa of coprophagous Coleoptera belonging to the five families were recorded: Aphodiidae (8), Geotrupidae (2), Hydrophilidae (2), Nitidulidae (1) and Scarabaeidae (12), with most abundant taxa belonging to the genus *Aphodius* and *Onthophagus*. Next to these, 11 taxa of coprophile, predatory Coleoptera have been recorded, specialized on coprophags: Histeridae (4) and Staphylinidae (7). New coprophagous and coprophile beetle taxa for Mt. Biokovo and Croatia have been found and some coprophagous representatives of Hydrophilidae and Nitidulidae for the first time in Croatia. Many specimens were holding parasitic acarions (Acari), belonging to families: Parasitidae and Macrochaelidae. A traditional extensive cattle breeding proves to be indispensable in preserving coprophagous associations, as well as general biodiversity on Mt. Biokovo.

A 25 Random fauna of true bugs (Heteroptera) collected by Csalomon[®] VARb3 funnel traps at science-educational station Jazbina in Zagreb

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During the growing season of 2008 Csalomon[®] VARb3 funnel traps were used for the monitoring of Cetoninae species. The traps were baited with synthesized scent of flowers and ornamental fruit plants. Traps varied in the color of attractive vane (yellow, blue and a combination of these two colors). Experiment was conducted in a mixed plum and cherry orchard at a research and educational station Jazbina in Zagreb. Orchard is surrounded by the oak trees and ground cover is dominated by native vegetation. Among the primary Cetoninae target species, a total of 108 true bugs (Heteroptera) were caught on a random basis. The traps were checked 14 times in 2008, starting on April 19, until August 21. The taxonomic identification was done following the Stichel keys. On the overall, 40 species of Heteroptera belonging to 12 families (Tingidae, Nabiiidae, Anthocoridae, Reduviidae, Miridae, Lygaeidae, Berytidae, Alydidae, Coreidae, Rhopalidae, Plataspidae and Pentatomidae) were found. The frequency of Heteroptera was calculated according to Balogh and the degree of frequency was calculated according to Tischler.

According to the degree of frequency test, 36 species of true bugs were characterized as accidental species and 4 were characterized as accessory species. Analysis of the catch frequency by Csalomon[®] VARb3 funnel traps has shown that these traps are not attractive to true bugs but can serve as an additional tool in the monitoring of Heteroptera species.

A 26 A new remarkable troglobitic pselaphide (Staphylinidae: Pselaphinae: Bythinini) from Velebit Mt., Croatia

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During the systematicall biospeleological research of Donja Cerovačka cave in the south of Mt. Velebit, a new remarkable troglobitic pselaphide genus, belonging to tribe Bythinini (Staphylinidae: Pselaphinae), has been found. Taxonomic characters and habitat ecology of the new genus are discussed.

New genus is completely adapted to terrestrial cave habitats, showing full depigmentation, anophthalmy, body and appendage elongation. Among the other Bythinini the new genus is recognized by very unique form of edeagus, as well as a series of other unique morphologic characters such as the absence of external basal fossette of elytra with inner fossette present and very pronounced. All specimens were

collected in the deepest parts of Donja Cerovačka cave in terrestrial cave habitat, characterized by total lack of light, very high relative air humidity (100%) and constant temperature of 7.5 °C.

A 27 Highly repeated non-coding DNA in *Tribolium castaneum* (Coleoptera) genome

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Non-coding DNAs are genomic sequences that do not encode for functional molecules. Satellite DNAs are non-coding DNA sequences repeated in tandem that compose significant portions of every eukaryotic genome. Many reports support involvement of satellite DNAs in complex structural and functional features of centromeric regions, but still, little is known about general functional features of these sequences. The genus *Tribolium* consists of species, some of them distantly related, which provide an excellent basis for evolutionary studies of satellite sequences. An extensive work on satellite DNAs in *Tribolium* species shows presence of high amounts (up to 40%) of different, centromeric species-specific satellite DNAs which share common structural features. Recently, *Tribolium castaneum* became the first coleopteran species with sequenced genome and emerged as a powerful insect model organism, especially in comparative analysis with *Drosophila melanogaster*. However, satellite repeats are underrepresented in assembled outputs of genome projects and high-resolution view of their composition and organization remains obscure. Results based on our *in silico* and experimental analysis of four different, highly abundant satellite DNAs, extracted from *T. castaneum* genome database, will be presented. Analysis of structure, organization, abundance and evolution in the genome, as well as a comparative studies of these satellite families show monomer length range between 166 and 370 pb, abundance from 0,1 to 17 %, different monomer diversity among families, organization in form of randomly mixed monomer variants, higher-order-repeats (HOR) of subfamilies or arrays of specific subfamilies and peri(centromeric) localization or dispersed pattern. Understanding different features of this sequence type in the sequenced *Tribolium castaneum* genome will help to gain a more comprehensive view of their possible role(s) in genome architecture and function.

A 28 Butterfly and moth (Lepidoptera) monitoring in the Nature Reserve Škocjanski zatok, Slovenia

Slavko Polak

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Škocjanski zatok (The Škocjan Bay Nature Reserve) covers an area of 122 ha and it is the largest brackish wetland in Slovenia. It is located near the coastal city of Koper and it consists of a brackish lagoon surrounded by reedbeds and agricultural land. The legal protection and the restoration of the wetland to conditions prior to the degradation were completed in 2007. In 2010 and 2011 the Author started with a regular monitoring of butterfly and moth species in the area. So far 298 species have been recorded but within moths and especially within Microlepidoptera we expect many more species. For butterflies (Palilionoidea) five transect lines have been regularly monitored and phenograms for the most abundant species have been produced. Since the natural grasslands in the area are not fully established yet, the butterfly species number is low, counting only 43 species. None of these species is endangered. On the contrary, using UV lamps on regular night moth monitoring, clearly underlines the natural conservation importance of the area. So far 19 species listed on the Slovene Red list as endangered species have been recorded in the area. Significant numbers of the endangered species are depending on the reed (*Phragmites australis*), the bulrush (*Typha* sp.) the sedge (*Carex* sp.) and the wetland grasslands. Some other species are typical for the Mediterranean coastal habitats with the sea bet (*Beta maritima*), the sea-lavender (*Limonium* sp.), the tamarisk (*Tamarix* sp.) etc. as caterpillar host plants. After restoration in 2007 the habitats within the area are changing rapidly. Some changes of Lepidoptera species composition have already been detected, thus monitoring Lepidoptera in the area should be conducted on a regular basis. Nature conservation issues as well proposed land management of the area are discussed in the paper.

A 29 Stonefly (Plecoptera) fauna in the lower reach of the Una River

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First study of stonefly fauna on the left bank of the border river Una was carried out during April and May 2009, and from July to November 2010. We were collecting qualitative samples of the adult Plecoptera at 9 different locations in the lower part of the Una River catchment area in Croatia. Aim of this study was to investigate diversity and distribution of stoneflies along the lower reach of the Una River and its tributaries. The results are based on the identification of adult insects and only in some cases, larvae and exuviae were taken into consideration. Altogether, 11 species of stoneflies were recorded from 5 families and 10 different genera; 3 of which belong to the family

Nemouridae (*Amphinemura*, *Nemoura*, *Protonemura*), 3 to the family Perlodidae (*Besdolus*, *Isoperla*, *Perlodes*), 2 to the family Perlidae (*Marthamea*, *Perla*), 1 to the family Taeniopterygidae (*Brachyptera*), and 1 to the family Leuctridae (*Leuctra*). Location with the highest diversity of stonefly fauna was the lower reach of the Čatlan Stream with 5 species recorded. The lowest diversity of stonefly fauna (1 species) was recorded at the lowest Una River locality (200 m before the mouth to the Sava River) and at the only spring locality (Jantalovića Spring). Despite the small number of recorded stonefly species in the study area, we found some remarkable species, which are for a longer time absent from many countries in Europe. *Marthamea vitripennis* was found again in Croatia after one century, together with *Perla burmeisteriana* and *Besdolus imhoffi*. All these species are included on the recent list of 50 strictly protected Plecoptera species in Croatia. Therefore, conservation of this important nature area should be one of the key concerns of environmental policies in Croatia and in Bosnia and Herzegovina.

A 30 Strogo zaštićene i zaštićene vrste u entomofauni Specijalnog rezervata prirode Zasavica

Stanković Mihajlo

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Specijalni rezervat prirode Zasavica je jedan od 98 prirodnih rezervata u Srbiji. Posle obavljenih preliminarnih istraživanja 1995/96. godine od strane Zavoda za zaštitu prirode Srbije, uvidelo se da Zasavica ima značajnu naučnu vrednost, zbog velikog broja vrlo retkih biljaka i životinja od Međunarodnog značaja. Pod zaštitom države je od 1997. godine, kada Vlada R. Srbije proglašava Zasavicu za "Specijalni rezervat prirode I kategorije" kao dobro od izuzetnog značaja za Republiku. Rezervat je član Međunarodnih organizacija za zaštitu prirode poput Europarc Federacije, IBA (Important Bird Areas), PBA (Prime Butterfly Areas), IPA (Important Plant Areas) i Ramsarskog biroa. Prema dosadašnjim istraživanjima faune rezervata Zasavica prikazanim u Zborniku naučnog skupa „Zasavica 2007“ utvrđeno je prisustvo preko 550 taksona invertebrata, od čega najveću zastupljenost imaju insekti (70%). U proteklih trinaest godina zabeležene su četiri nove vrste insekata za faunu Srbije. Prema Zakonu o zaštiti prirode (Službeni glasnik RS 88/2010-Prilog I i II) u rezervatu Zasavica konstatovane su strogo zaštićene vrste i zaštićene vrste. Od strogo zaštićenih vrsta treba istaknuti sledeće insekte: red Coleoptera: *Carabus ulrichii*, *Cerambyx cerdo*, *Morimus asper funereus*, *Pilemia tigrina*, *Osmoderma eremite*, *Adalia bipunctata*, *Anatis ocellata*, *Oryctes nasicornis*, *Lucanus cervus*; red Lepidoptera: *Lycaena dispar*, *Satyrium w-album*, *Apatura iris*, *Apatura metis*, *Papilio machaon*, *Zerynthia polyxena*, *Pieris brassicae*, *Melitaea aurelia*; red Orthoptera: *Acrida ungarica*, *Tettigonia cantans*; red Hymenoptera: *Myrmica sabuleti* i *Myrmica scabrinodis*. Od zaštićenih vrsta u rezervatu konstatovane su sledeće vrste insekata: red Odonata: *Epithea bimaculata*, *Gomphus flavipes*; red

Orthoptera: *Locusta migratoria* i *Metrioptera (Zeuneriana) amplipennis*; red Hymenoptera: *Liometopum microcephalum*; red Coleoptera: *Stenopterus similatus*.

Strictly protected and endangered species in fauna of the Special Nature Reserve Zasavica

Stanković Mihajlo

Special Nature Reserve of Zasavica, Sremska Mitrovica, Serbia.

Special Nature Reserve Zasavica is one of 98 nature reserves in Serbia and a fossil bed of the rivers Drina and Sava built during the Holocene. This wetland area is 33.1 km long and 100 m wide occupying 1825 ha, together with its surrounding floodplain forests and damp meadows. It is under state protection since 1997, when the Government of the Republic of Serbia declared Zasavica for "Special Nature Reserve Category I" as an asset of great importance for the Republic. The reserve is a member of International conservation organizations such as Europarc Federation, Important Bird Areas (IBA), Prime Butterfly Areas (PBA), Important Plant Areas (IPA) and Ramsar Convention.

According to the results of previous entomological studies published in the Proceedings of scientific conference "Zasavica 2007" fauna of the Reserve mainly consists of invertebrates with more than 550 taxa, mainly insects (70%). In the past thirteen years four new insect species for the fauna of Serbia were recorded here. According to the Nature Protection Act (Official Gazette RS 88/2010-Anex I and II) many strictly protected and protected species were observed in Nature Reserve. Within strictly protected species of insects the most interesting findings in the Reserve are: order Coleoptera: *Carabus ulrichii*, *Cerambyx cerdo*, *Morimus asper funereus*, *Pilemia tigrina*, *Osmoderma eremite*, *Adalia bipunctata*, *Anatis ocellata*, *Oryctes nasicornis*, *Lucanus cervus*; order Lepidoptera: *Lycaena dispar*, *Satyrrium w-album*, *Apatura iris*, *Apatura metis*, *Papilio machaon*, *Zerynthia polyxena*, *Pieris brassicae*, *Melitaea aurelia*; order Orthoptera: *Acrida ungarica*, *Tettigonia cantans*; order Hymenoptera: *Myrmica sabuleti*, *Myrmica scabrinodis*. Within protected species of insects the most interesting findings in the Reserve are: order Odonata: *Epithea bimaculata*, *Gomphus flavipes*; order Orthoptera: *Locusta migratoria*, *Metrioptera (Zeuneriana) amplipennis*; order Hymenoptera: *Liometopum microcephalum*; order Coleoptera: *Stenopterus similatus*.

A 31 Butterflies of Croatia: status, threats and conservation

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Butterflies are considered valuable biodiversity indicators because they occur in a wide range of habitats and respond rapidly to changes in environment and management. The

checklist of butterflies of Croatia is a result of our recent attempts to document the butterfly diversity and create a national database. The overall picture showed a total of 194 species. The history of studying butterflies in Croatia begun in 19th century and the level of knowledge has raised considerably from that time. Still, information on distribution and trend of species are poor because the majority of studies are focused on fauna on a small region/area. Problems of categorizing a poorly-documented fauna will be pointed. Some examples of recent changes in range and species diversity will be linked with the causes of change: habitat decline, loss and fragmentation. Recently we assessed the status of butterfly fauna of Croatia. In the absence of substantial historical information on abundance changes, we used the distribution change criteria of IUCN to create a list of threatened butterflies of Croatia and the Red book of threatened butterflies of Croatia which is under preparation. About 25% of Croatia's butterfly fauna is of conservation concern including species of national and European concern. All threatened species are legally protected. The main causes for the declines are thought to be changes in rural land use, especially land abandonment or agricultural intensification.

A 32 Emergence of caddisflies (Trichoptera, Insecta) at lakes and tufa barriers in the Plitvice Lakes National Park

Petra Šemnički, Ana Previšić, Marija Ivković, Kristina Čmrlec & Zlatko Mihaljević

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Caddisflies (Trichoptera, Insecta) are one of the most diverse and abundant groups of aquatic insects. Plitvice Lakes NP was chosen for studying ecology of caddisflies due to high variety of habitats with different substrates. The main goals of this study were to determine composition, diversity, emergence patterns and trophic structure of trichopteran communities at tufa barriers and barrage lakes. Caddisflies were collected monthly during 2008 using emergence traps at 6 locations. A total of 2265 individuals and 43 species were collected. The highest number of species and individuals were collected at Labudovac barrier and diversity was highest at Labudovac and Novakovića Brod barriers. Emergence peaks were recorded in the summer and in the late spring and summer at tufa barriers and lakes, respectively. Emergence patterns of the most abundant species are in accordance with results of previous studies in the Plitvice Lakes NP. Regarding distribution at different microhabitats, highest and lowest number of species were recorded on gravel and particulate tufa, and silt, respectively. At tufa barriers, trichopteran community was dominated by collectors filterers, and at lakes by predators-collectors filterers, shredders-predators-scrapers and scrapers-xylophagus.

ABSTRACTS

POSTER PRESENTATIONS

A 33 A preliminary study of forensic entomology in Croatia

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In this project, the first forensic entomological research in Croatia, the main goal was to determine which necrophilic insect species infest the body of a dead piglet in Croatian environmental conditions. Piglet was placed in a cage in thick forest of *Salix* and *Populus* on the bank of river Sava, from 18th of July till 14th of August 2007. Insect fauna was sampled from the body of a piglet every day, when their life cycles were monitored. Also, daily temperature and humidity were recorded. In total three necrophilic insect species were collected, two dipterans and one beetle: a blowfly *Lucilia sericata* L. (Diptera: Calliphoridae), a flesh fly *Sarcophaga carnaria* L. (Diptera: Sarcophagidae), and a burying beetle *Nicrophorus vespillo* L. (Coleoptera: Silphidae). The first emerging blowflies were collected on the tenth day of the experiment. This rapid development was unexpected and we propose that it was a result of high summer temperature and humidity combined with specific floral environment. Completion of life cycle for *S. carnaria* was not recorded. Burying beetle has not laid any eggs, it was collected on the second day of experiment and there is no record of beetle activity in later stages of decomposition. This happened due to large number of fly maggots which were feeding on the carcass and left no food resource which beetles could use for their development. In addition to the necrophilic species, the predatory wasp *Vespula germanica* F. (Hymenoptera: Vespidae) was also collected during the experiment, but its life cycle was of little interest as this species is not a part of the decomposition process.

A 34 Catalogue of the family Elateridae from Croatia

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The Elateridae is one of the most diverse families of order Coleoptera. It is represented by 12 – 15 subfamilies, with 37 or more tribes divided into approximately 750 genera, with about 10.000 species described worldwide. In Europe there are 90 genera subdivided into 672 species. A systematic faunistic research on family Elateridae in Croatia has not yet been carried out, but there are data about specimens in entomological collections, as well as the data about specimens listed in published faunistic papers. Croatian elaterid specimens are housed in three public entomological collections: Koščec, Hensch and Novak. Based on the revision of these entomological collections and reviewing of faunistic papers, a complete catalogue of the family Elateridae in Croatia has been proposed.

This paper presents the first comprehensive catalogue data on the Elateridae fauna in Croatia and presently quotes 59 genera divided into 171 species. There are six species currently known only from Croatia: *Elathous impressifrons* (Hampe, 1866); *Athous novaki* Penecke, 1907; *Athous croaticus* Platia & Gudenzi, 2002; *Athous dalmatinus* Platia, 2005; *Athous gracacensis* Platia, 2005; *Athous monguzzii* Platia & Gudenzi, 2007. The results also show that the number of species in Croatia is four times lower than in Europe. The number of genera is only 1.5 times lower than in Europe, which shows the great biodiversity of the family Elateridae. There are some entomological collections (e.g. Weingärtner collection and Koča collection in Croatian Natural History Museum in Zagreb) containing unprocessed elaterid specimens, which are therefore not included in this catalogue. Inclusion of these specimens would most likely enlarge the number of known species of the family Elateridae in Croatia.

A 35 New, rare and endangered longhorn beetles (Coleoptera: Cerambycidae) of Serbia

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Within the 550 species of European longhorn beetles, about 250 are found in Serbia. Among those, 142 species can be considered rare or endangered. There are 59 rare species in Serbia, with only one or two records. Due to the transformation of fragmentary steppe habitats into the agricultural land, 28 phytophagous species are now considered endangered (11 of those additionally considered rare). With the devastation of old forests and over-exploitation of wood, 82 xylophagous species are endangered (33 of those considered rare). Seven species are listed as new for Serbian fauna: *Leptorrhabdium illyricum*, *Pedostrangalia verticalis*, *Callimoxys gracilis*, *Deilus fugax*, *Pedestredorcadion lineatocolle*, *Pedestredorcadion arenarium*, *Pogonocherus ovatus*.

A 36 Emergence of the true flies (Diptera, Insecta) on tufa barriers in the Plitvice lakes National park

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True flies (Diptera, Insecta) are regarding number of families and abundance one of the most important group of aquatic insects. The goals of this study were to determine emergence patterns and main ecological factors that influence composition and abundance of specimens and emergence of families on tufa barriers in Plitvice lakes NP. Also correlations between abundance of predator families and amount of their prey

were explored, as well as differences in abundance on longitudinal scale and on various microhabitats. Sampling was conducted monthly on 3 tufa barriers during 2007/2008 with 6 traps placed at each site. During both years site Barijera Novakovića Brod had highest diversity and number of families. Sampling site Barijera Novakovića Brod had the highest total catch during 2007, and site Barijera Labudovac during 2008. Overall, families Simuliidae and Chironomidae were the most abundant during the investigated period. Temperature had influence on start of emergence and duration of flight period. For families Empididae, Chironomidae and Simuliidae statistically significant correlation between abundance and current velocity was observed. Diptera families preferred all substrates except silt. Microhabitats with more prey had greater predator abundance.

A 37 Water scavenger beetles (Hydrophilidae, Coleoptera) of Croatia: phylogenetic analysis using mitochondrial markers

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Due to worldwide decline in biological quality of water ecosystems, planning for freshwater biodiversity conservation is strongly needed. Water beetles (Coleoptera, Polyphaga) are known to be useful bio-indicators, especially because of their adaptation to specific environmental conditions. Hydrophilidae is a heterogeneous family of water scavenger beetles, and numerous studies of their taxonomy, morphology, and recently, their phylogeny (especially of superfamily Hydrophiloidea) were conducted. On the other hand, data on Hydrophilidae in Croatia are still scarce.

Here we present results of screening of fauna of Hydrophilidae in Croatia with the aim of inferring present state of their diversity and phylogenetic status of taxa. Specimens were collected on several localities in southern, eastern and central Croatia, and identified based on morphological characters. About 20 species belonging to about 10 genera of Hydrophilidae were identified. Mitochondrial genes for cytochrome oxidase subunit I (COI) and small ribosomal subunit (12S rRNA) were PCR amplified, sequenced and aligned with available matching sequences of Hydrophilidae and Hydrophiloidea deposited previously in GenBank. Phylogenetic trees were constructed using distance, parsimony and Bayesian methods, and obtained topologies examined. Preliminary results presented here are largely in concordance with previously published phylogenies within Hydrophilidae and Hydrophiloidea, and give valuable indications on phylogenetic relationships of several taxa that were not examined in previous studies. However, positions of certain taxa could not be affirmed with high support, and therefore should be checked and verified by the use of additional molecular markers. Our results contribute to knowledge of fauna of Hydrophilidae in Croatia, and provide a basis for further investigations on phylogeny and taxonomy of water beetles in general.

A 38 Faunistics, ecology and biogeography of the cave-dwelling spiders of the families Nesticidae and Agelenidae (Araneae) in Croatia

Andela Ćukušić¹ & Martina Pavlek^{1,2}

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Spiders are one of the most taxa rich groups of animals in cave habitats in Croatia and are represented, among others, by families Agelenidae and Nesticidae. Family Nesticidae is represented by the widespread genus *Nesticus* and for family Agelenidae most common genera are *Histopona*, *Malthonica* and *Tegenaria*. Here we present a complete list of taxa belonging to these families occurring in Croatia based upon available literature, analysis of the material from Croatian Biospeleological Society collection and material collected during our field trips. A total of 24 species has been recorded from over 700 speleological objects and a few epigean habitats. Some of them are new for Croatian fauna, for others new localities are given, and for the majority of species distribution ranges are extended. Hence, we present distribution maps of these species with special emphasis on their distribution in Croatia. Additionally, we define endemic status of these species and discuss their ecology.

A 39 The spider (Araneae) fauna of the Kornati National Park

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As it is the case for the whole Croatia, majority of data on the spider fauna of the central Dalmatia dates back to the early 20 century. However, some recent works on the fauna of spiders of Zadar area have been published by Dobroruka (1994) and Rucner & Rucner (1995). Contribution to the knowledge of spider fauna of Dalmatia is also given by the Association for Biological Research – BIOM through their research of Karišnica River Canyon and Lake Vrana. In order to further collect data on the spider fauna of Dalmatia, Section for spiders of the Biology Students Association BIUS, conducted a survey on spiders of the Kornati National Park in 2009.

The research was conducted as part of the biological research camp “Kornati 2009” organized by the BIUS. Section for spiders spent a total of 12 days in the field, from 14 to 21 May and from 26 September to 1 October 2009. The research included Kornat Island and several neighbouring islands that are a part of the National Park: Gustac, Piškera, Lavsa, Levernaka, Mana and Velika Smokvica. Sampling sites were selected according to the habitat types, i.e. olive groves, rocky pastures, dry meadows and pine forests. The aim was to include as many different habitats as possible, in order to collect as many spider taxa as possible. Sampling was conducted by hand collecting and using exhaustors (pooter). Preliminary results are shown within this poster presentation.

A 40 The aphids fauna (Hemiptera: Aphidoidea) in a watermelon

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In this poster presentation the fauna of aphids of watermelon in the area Neretva vally is presented. Beside to feeding on plants, some aphids transmit one or more virus diseases. The natural spread of aphid transmitted cucurbit viruses is often accomplished by *Acyrtosiphon pisum* (Harris), *Aphis craccivora* Koch, *Aphis gossypii* Glover and *Mysus persicae* (Sulzer). Aphid transmitted viruses in cucurbits have been poorly investigated in Croatia, *Cucumber mosaic cucumovirus* (CMV) sporadically occurs on cucurbits. The aim of this study was to investigate and identify aphid species in a watermelon field. The field experiment with watermelon [*Citrullus lanatus* (Thunb.) Matsum & Nakai] was conducted during 2004 and 2005 at Opuzen (43°00'N, 17°34'E, 3 m elevation) located in the Mediterranean area of Croatia. Opuzen is situated in the delta of the river Neretva, which represents the most important watermelon-growing area in Croatia. Aphid sampling was carried out using yellow water traps (70x70x12 cm). Traps were installed at the date of transplanting and observed daily in order to determine initial aphid flight prior to the first sampling. Insect samples were collected once a week. The collected material was inspected and aphids were separated out using a stereomicroscope (Zeiss, Stemi 2000). Aphid specimens were preserved in plastic vials containing 70% ethanol until identification according to taxonomy keys. The domination was calculated by Balogh formula. The results (predominant, dominant, subdominant, recedent, subrecedent) are presented according to Tischler and Heydeman. During the study of the aphid population, 70 species in 48 genera were detected, with 63 species in 42 genera being identified in 2004 and 44 species in 31 genera in 2005. All species referred to the Aphididae. The overall seasonal percentage composition showed that *Toxoptera aurantii* (Boyer de Fonscolombe) (34% in 2004 and 23% in 2005) and *A. gossypii* (15% in 2004 and 24% in 2005) were consistently predominated in both years.

A 41 Molecular phylogeny of the genus *Carabus*

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The phylogenetic relationships within the Carabidae family (Coleoptera) are not yet fully understood. New researches indicate digressions from recognized classifications. In this research, phylogenetic relationships between 23 species from genus *Carabus* were analyzed. Analysis was based on the DNA sequences of mitochondrial genes for 16S rRNA, cytochrome c oxidase subunit I and ND5 gene for NADH dehydrogenase 5. The aim of the research was to define the phylogenetic relationships in the systematics of Carabids within the genus *Carabus* Linnaeus 1758 (Carabini, Carabinae, Carabidae)

and check matching of the molecular data with the existing morphological classifications based on the structure of frontal shields of larvae and structure of the endophallus in adult specimens. Beetles were collected in the area of Mt. Medvednica (Croatia), in the period May - October 2007, and immediately after the sampling they were stored in 96% ETOH until the beginning of laboratory processing. Data for other species were retrieved from the GenBank (www.ncbi.nlm.nih.gov). For phylogenetic inference the following methods were used: maximum likelihood and Bayesian analysis.

The obtained results showed greater concordance of molecular data with classifications based on the structure of endophallus than with the frontal shields of larvae. The results correspond to the phylogram in the previous study, suggesting that system categories within the genus *Carabus* cannot be based only on the structure of the endophallus, but the results of molecular analysis should also be included.

A 42 Biodiversity of jumping plant-lice (Hemiptera: Psylloidea) in Serbia

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Jumping plant-lice or psyllids (Hemiptera: Psylloidea) are tiny insects 2-3 mm in size. These are phytophagous insects with narrowly restricted host plant. Until now more than 3000 species have been described worldwide and the greatest number of species favoured warm climates. In Central Europe 196 species were determined. In Serbia for years major interest has been focused on studying a few agricultural pest species primarily pear psyllids and this contributed to the lack of knowledge on this insect group.

The fauna of jumping plant-lice in Serbia was investigated from 2005 to 2009. Investigations comprised 419 localities. Seventythree species of jumping plant-lice belonging to 16 genera and 4 families (Calophyidae, Homotomidae, Psyllidae and Triozidae) were sampled from 77 plant species belonging to 49 genera and 25 families. The majority of the species determined was from the family Psyllidae (48) followed by Triozidae (23), Calophyidae (1) and Homotomidae (1). The most numerous was the genus *Cacopsylla* (27 species) followed by the genus *Trioza* (16 species), *Bactericera* (6), *Psyllopsis* (6), *Aphalara* (4), *Craspedolepta* (2), *Livilla* (2), *Psylla* (2). Only one species was determined for each of the following genera *Acizzia*, *Calophya*, *Homotoma*, *Livia*, *Camarotoscena*, *Rhinocola*, *Baeopelma* and *Trichohermes*.

Sixtyseven host plants were determined from 43 genera and 23 families, of which 38 were trees and shrubs and 29 herbaceous plants. The majority of host plants belonged to the family Rosaceae (17), Asteraceae (9) and Salicaceae (7). Nine new host plants were determined of which four were crops. The majority were narrow oligophages (63.06%) followed by wide oligophages (21.54%), monophages (12.31%) and poliphages (3.07%).

In Serbia the majority of these species belong to the Palearctic region (54).

Considering some thoroughly investigated European regions, the number of 73 jumping plant-lice species determined presents therefore 2/3 of the expected number of species of which their share in Serbia ranges from 80 to 90.

A 43 Ant fauna of Kornat Island

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Kornati National Park, located in the central part of the Croatian Adriatic, occupies an area of 220 km² and includes 89 islands and islets. Kornat is the largest island forming the Kornati archipelago. The vegetation is heavily degraded, and the island is predominantly covered in sparse grassland. Until now only one ant species has been reported for the island. We present the first systematic study of the myrmecofauna of the Kornat Island which was carried out in May and September 2009. Ants were sampled by a standardized method employing constant effort by hand collecting and baiting at 70 randomly selected sites. Additionally, unbaited pitfall traps were used at three sites to test sampling efficiency. Thirty-five ant species, belonging to 14 genera and 3 subfamilies, were found in total. Notably, two of the collected species, i.e. *Lasius brunneus* and *Aphaenogaster subterranooides*, were sampled only with pitfall traps. On average, more than twice as many individual specimens were found per site in May as in September, indicating that the ant activity is higher in spring. Both our statistical analysis and additional sampling with pitfall traps show that several more species not recorded in our study might be present on the island. Considering that our results discovered a great diversity of the ant fauna at the island, that the area of the island is small and the habitat is quite homogenous, additional investigations on the island would be beneficial.

A 44 Psocodea fauna in the Republic of Croatia

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In this poster presentation Psocodea fauna of Croatia is described. Total number is 62 species from 3 suborders, 13 families and 24 genera. In the close spaces (store houses for the agricultural products- grain wheat, maize, rice, other- dough, dry meat) 16 species of psocids were registered: *Trogium pulsatorium*, *Lepinotus reticulatus*, *L. inquilinus*, *dorypteryx domestica*, *Psyllipsocus ramburi* f. *destructor*, *P. ramburi* f. *troglodytes*, *Liposcelis bostrichophila*, *L. corrodens*, *L. brunnea*, *L. decolor*, *L.*

entomophila, *L. mendax*, *L. paeta*, *L. pearmani*, *L. pubescens*, *L. tricolor*. In the nature on the agricultural plants, in the forests, swampy plants, different weeds, shrubs, decorative plants in the parks, in apiaries, wasp nests, barn owl, cane roofs, dry fish nets, plants parts 46 species were found: *Cerobasis guestfalica*, *Psyllipsocus ramburi* f. *macroptera*, *P. ramburi* f. *brachyptera*, *Liposcelis rufa*, *L. keleri*, *L. silvarum*, *L. palatina*, *Caecillius fuscopterus*, *C. flavidus*, *C. piceus*, *C. piceus* var. *brevipennis*, *C. rhenanus*, *C. burmeisteri*, *C. atricornis*, *Stenopsocus immaculatus*, *S. stigmaticus*, *S. lachlani*, *Graphopsocus cruciatus*, *Elipsocus moebiusi*, *Cuneopalpus cyanops*, *Philotarsus picicornis*, *Peripsocus phaeopterus*, *P. albogutatus*, *P. subfasciatus*, *P. parvulus*, *P. reductus*, *Ectopsocus briggsi*, *E. meridionalis*, *Ectopsocopsis cryptomeriae*, *Lachesilla querecus*, *L. pedicularia*, *L. pedicularia* f. *brevipennis*, *L. pedicularia* f. *holoptera*, *L. pedicularia* f. *brachyptera*, *L. bernardi*, *Amphigerontia bifasciata*, *A. contaminata*, *Blaste conspurcata*, *B. quadrimaculata*, *Psococerastis gibbosa*, *Metylophorus nebulosus*, *Trichadenotecnum majus*, *T. sexpunctatum*, *Neopsocus rhenanus*, *Trichopsocus dalii*, *Embidopsocus enderleini*. The most numerous are the representatives of the family Liposcelididae in the close spaces, in the nature representatives of the family Lachesilididae.

A 45 Habitat and new findings of *Cetonia aurata* (Linnaeus, 1761) (Coleoptera, Cetoniidae) in Bosnia and Herzegovina and neighboring countries

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The genus *Cetonia* Fabricius is almost entirely Palaearctic genus which includes 18 species divided into three subgenera *Cetonia* Fabricius, 1775, *Indocetonia* Mikšić, 1965 and *Eucetonia* Schoch, 1894. All European species, whose centre is in the Mediterranean area, belong to the subgenus *Cetonia* Fabricius. The European fauna has only four (Alonso-Zarazaga & Krell, 2007) (five by Baraud, 2001) species, with just one of them in the central part of Balkan peninsula: *C. aurata* Linnaeus; the others are: *C. carthami* Gory-Percheron, 1833 (Balearic Islands, Svalbard & Jan Mayen, Italian mainland, Sicily, Sardinia, Corsica, French mainland, Portuguese mainland), *C. cypriaca* Alexis, 1994 (Cyprus), *C. asiatica* Gory-Percheron, 1833 and *C. oertzeni* Reitter, 1885 (Crete; Mikšić, 1965). It was noticed that *C. asiatica* Gory-Percheron, 1833 is in fact a synonym for *C. oertzeni* Reitter, 1885 (Mikšić, 1982). The species *C. aurata* Linnaeus is an exceptionally variable species, but mainly in qualitative sense (Kašić-Lelo & Lelo, 2007).

There are three (J. Baraud mentioned fourth) subspecies in Europe: (1) *C. a. pallida* Drury, 1770 – Torque, without any doubt!, and Bulgarian, Ukraine, Turkistan; (2) *C. a. pisana* Heer, 1841 – is found in Corsica, French mainland, Greek mainland, Italian mainland, Malta, Sardinia and Switzerland; (3 by J. Baraud) *C. a. sicula* Aliquo, 1983 is

found in Sicily and (4) *C. a. aurata* Linnaeus, 1761 – inhabits almost whole Europe (except for certain border areas), the Balkan Peninsula (except the Peloponnesus), Asia Minor, the Euro-Siberian part of Central Asia (Kašić-Lelo & Lelo, 2007).

The adult individuals of the species *C. aurata* Linnaeus are exceptionally heliophilic; they are fed on pollen, nectar and juice of damaged trees (Mikšić, 1965, 1982; Baraud, 2001; Zarazaga & Krell, 2007).

Mentioned individuals are medium-sized. Their body is covered by fine hair (fresh samples), with very conspicuous, often metallic shining coloration (green, coppery, purple, bronzy, and blue). The middle and posterior tibiae have each two typical movable apical spines at the top and interior part. Males are clearly differentiated from females by the presence of an impression in the abdominal sterna (Lelo, 2000, 2003; Kašić-Lelo & Lelo, 2002, 2005, 2007).

C. a. aurata L. inhabits whole Western part of the Balkan Peninsula (Croatia, Bosnia and Herzegovina, Serbia and Monte Negro). In the last 10 years authors have collected several thousands specimens of mentioned (sub)species from Bosnia and Herzegovina, Serbia and Montenegro (Kašić-Lelo & Lelo, 2007, 2010a, 2010b). In Croatia we have notes of many specimens but without collecting activities. However, we have got many specimens from Croatia collected by our students or friends. All of our and known data are used for creating original map of provisional distribution of mentioned subspecies in Bosnia and Herzegovina and neighboring countries.

A 46 Emergence patterns and microhabitat preference of Simuliidae (Diptera) on tufa barriers in Plitvice Lakes NP

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Blackflies (Diptera, Simuliidae) are blood-sucking insects which have great economic, veterinary and medical importance as they are vectors of the protozoan parasites. A total of 37387 adult Simuliidae were caught during 2007 and 2008 at the Plitvice lakes, Croatia, using pyramid-type emergence traps. Samples were taken monthly on 3 tufa barriers, Tufa barrier Labudovac, Tufa barrier Kozjak-Milanovac and Tufa barrier Novakovića Brod, with 6 traps placed on each barrier. The main goals of this study were to determine the species composition on tufa barriers of the Plitvice lakes NP and to determine their emergence patterns and microhabitat preference. The blackflies of the Plitvice lakes are represented by 10 species of the genus *Simulium*. The most abundant species in both 2007 and 2008 was *Simulium (Eusimulium) angustipes* with 98% of the total catch. The highest number of individuals caught during 2007 was on the barrier Kozjak-Milanovac and during 2008 on the barrier Labudovac. During both 2007 and 2008 highest diversity was recorded on the barrier Novakovića Brod. Emergence started in early spring, and most of the species had two peaks, in early summer and autumn. All Simuliidae, including the most abundant species, *Simulium (Eusimulium) angustipes* and *Simulium (Neveromania) costatum*, exhibited statistically significant positive

correlation between abundance and current velocity of the water. Also, the species *Simulium (Eusimulium) angustipes* preferred substrates like moss and gravel.

A 47 Butterflies (Lepidoptera: Rhopalocera) contribution to the knowledge of biotic diversity of Bansko Brdo

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Bansko Brdo is an elongated plateau located in the north eastern region of Baranja (Eastern Croatia), near the border with Hungary. Butterflies of Bansko Brdo were never systematically researched and only a small number of species was recorded until now. During the last two years a survey of butterflies at 10 localities was carried out in order to gain insight into the fauna of this interesting region. The localities were divided into two groups, 5 on the north eastern side of the hill and 5 on the south western side. In total 64 species were recorded, out of which 15 are new records for Bansko Brdo. The north eastern localities had a 15 % greater number of species, and 25 % greater number of specimens in comparison with the south western side. Regarding zoogeography, Euro Siberian species of butterflies are prevailing on the Bansko Brdo.

A 48 Contributions to the knowledge of the insects fauna on the Bansko Hill area: Horse flies (Diptera: Tabanidae) and Dragonflies (Odonata)

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The studies of horse flies and dragonflies of the Bansko Hill surroundings were carried out from April to September 2010. The following methods were used: collecting by canopy traps with attractants or entomological nets, the method of strolling and observing. Mapping and digital analyses of the data were done using ArcView 9.2 program. On the basis of the 362 collected specimens of horse flies and literature data a total of 19 species of 6 genera and 2 subfamilies were recorded. On the basis of the 618 collected individuals at different stages of life (larvae - exuvia and adult individuals), a total of 27 species, 22 genera, 8 families and 2 suborders of the order Odonata were recorded. Out of these numbers, 5 species of horse flies: *Chrysops viduatus* (Fabricius, 1794), *Atylotus loewianus* (Villeneuve, 1920), *Tabanus bovinus* Linnaeus, 1758, *Hybomitra solstitialis* (Meigen, 1820) and *Heptatoma pellucens* (Fabricius, 1776) and 5 species of dragonflies: *Coenagrion ornatum* (Selys, 1850), *Hemianax ephippiger* (Burmeister, 1839), *Libellula fulva* (Müller, 1764), *Orthetrum coerulescens* (Fabricius, 1798) and *Sympetrum flaveolum*, Linnaeus, 1758 are new for the Bansko Hill. The horse fly species with the highest abundance were *Tabanus tergestinus* Egger, 1859 (36.74 %),

T. bromius Linnaeus, 1758 (25.70 %) and *T. maculicornis* Zetterstedt, 1842 (13.81 %). The dragonfly species with highest abundance based on frequency of encounter were: *Aeshna mixta* Latreille 1805, *Coenagrion puella* (Linnaeus, 1758), *Ischnura elegans* (Vander Linden, 1820), *Orthetrum albistylum* (Selys, 1848), *Sympetrum striolatum* (Charpentier, 1840). *Sympecma fusca* (Vander Linden, 1820), *Sympetrum depressiusculum* (Selys, 1841) and *Sympetrum fonscolombi* (Selys, 1840) had lowest abundance. The established qualitative structure of these two insects groups in the study area represents 24.35 % of horse flies, and 36.98 % of dragonfly national fauna, respectively. Our research proves that the study area is significant for the protection of the biodiversity of the insect fauna.

A 49 New species of hoverflies (Diptera: Syrphidae) in Macedonia

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After many years investigation of hoverflies (Diptera: Syrphidae) throughout Macedonia we have stated 262 taxa from 69 genera. This comes from reviewed collections in Natural History Museum of Macedonia – Skopje (SKO) and Biology and Ecology Department – Novi Sad (IBNS), revision of all literature data referring to Syrphidae in Macedonia, as well as our own investigations, therefore were stated 262 taxa from 69 genera.

Especially to be underlined two taxa newly described and type material comes from our collections. They are: *Platycheirus meridimontanus* Nielsen, 2004 and *Platycheirus meridimontanus* Nielsen, 2004 (Nielsen, 2004).

Species of taxon *Merodon bessarabicus* Paramontov, 1924 belong to species whose taxonomic and nomenclature status still remain unsolved (Vujić, oral announcement). Most probably it is a new species for science similar to *Merodon bessarabica* described in the former USSR, nowadays Ukraine.

Of extraordinary significance are two species, *Camaesyrrhus caledonicus* Collin, 1940 and *Merodon telmateia* Hurkmans, 1987, new for the Balkan Peninsula.

Thirty eight taxa are being registered for the first time in Macedonia: *Baccha obscuripennis* Meigen, 1822; *Cheilosia frontalis* Loew, 1857; *Cheilosia grisella* (Becker, 1894); *Cheilosia hypena* Becker, 1894; *Cheilosia melanura* Becker, 1894 ssp. *melanura* Becker, 1894; *Chrysotoxum lessonae* Giglio Tos, 1890; *Criorhina pachymera* Egger, 1858; *Epistrophe grossulariae* (Meigen, 1822); *Epistrophella euchroma* (Kowarz, 1885); *Eristalinus megacephalus* (Rossi, 1794); *Eristalis jugorum* Egger, 1858; *Eumerus argyropus* Loew, 1848; *Eumerus clavatus* Becker, 1923; *Eumerus sulcitibus* Rondani, 1868; *Eupeodes lapponicus* (Zetterstedt, 1838); *Eupeodes latifasciatus* (Macquart, 1829); *Ferdinandea ruficornis* (Fabricius, 1775); *Helophilus pendulus* (Linnaeus, 1758); *Mallota fuciformis* (Fabricius, 1794); *Megasyrphus erraticus* (Linnaeus, 1758); *Melangyna labiatarum* (Verrall, 1901); *Meligramma cingulata* (Egger, 1860); *Microdon miki* Doczkal

et Schmid, 1999; *Myolepta obscura* Becher, 1882; *Neoascia meticulosa* (Scopoli, 1763); *Orthonevra frontalis* (Loew, 1843); *Paragus albifrons* (Fallen, 1817); *Paragus constrictus* Šimić, 1986; *Parasyrphus punctulatus* (Verrall, 1873); *Parasyrphus vittiger* (Zetterstedt, 1843); *Pipizella annulata* (Macquart, 1829); *Pipizella speighti* Verlinden, 1999; *Riponnensia longicornis* (Loew, 1843); *Riponnensia morini* Vujic, 1999; *Sphegina clavata* (Scopoli, 1763); *Sphegina elegans* Schummel, 1843; *Spilomyia triangularis* van Steenis, 2000 i *Temnostoma meridionale* Krivosheina et Mamayev, 1962.

A 50 Identifying important areas for conservation of Odonata in Bosnia and Herzegovina

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High diversity of freshwater habitats in Bosnia and Herzegovina resulted in rich and diverse Odonata fauna that is still insufficiently explored. The main aim of this study was contribution to activities on conservation of freshwater habitats and Odonata species in the country. Research conducted in 2009 and 2010 resulted with significant number of new data on dragonflies. So far, 60 species of Odonata are known from Bosnia and Herzegovina but the number is expected to increase in near future. Based on analysis of distribution of species of European concern (threatened species according to European and Mediterranean Red Data list of dragonflies and Habitats Directive), nationally rare species and areas with high species diversity, several areas were identified as important for conservation of Odonata in Bosnia and Herzegovina. However, as data from many areas of the country are still missing, more of them will certainly be identified in the future.

A 51 Body and wing size changes in Carabid beetles (Coleoptera: Carabidae) along the elevation gradient in forest habitats of Učka mountain

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Within the mountain ranges, the intensity of changes of various environmental conditions can significantly affect survival adaptations for the whole variety of living organisms. The aims of this study were: (i) to compare carabid species composition according to their body size, wing forms and habitat affinity along elevation gradient (ii) to compare body length within the species *Abax parallelepipedus* (Piller & Mitterpacher, 1783) and *Carabus caelatus* Fabricius, 1801 and (iii) to test if the results are in concordance with Bergmann's and Allen's rules. Pitfall traps (5 per plot) were placed on eleven plots along the elevation gradient on Učka Mountain. Traps were operative

during May-October in 2008. Results show decrease in body size within carabid communities along the elevation gradient. Brachypterous species increase within the carabid communities on higher elevations, except of the mountain top where they decrease. Share of smaller species increases from lower to higher elevations. The highest proportions of brachypterous species were recorded half way along the elevation gradient. Negative correlation of the body size within the species *A. parallelepipedus* and *C. caelatus* was recorded along the elevation gradient. Obtained results were not in compliance neither with Bergmann's nor Allen's rule.

A 52 Biospeleological Research of Resanovačke Pećine Caves: Ledenica Cave

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Resanovačke Pećine Caves belong to Vijenac tectonic unit, extended in northwest - southeast direction, northerly from Mt. Dinara in Bosnia and Herzegovina. Ledenica, or Resanovačka Ledenica Cave, is located on NW part of Resanovac polje on the slopes of Mt. Stražbenica. The cave was named "Ledenica" (Ice Cave) due to the ice accumulation in the entrance chamber which usually remains until summer. The cave contains one big fossil channel close to 700 m long, 40 meters wide and 25 meters high, particularly rich of sinters.

Recent research of Ledenica cave, in June 2010, has been performed in collaboration with Biospeleological Society of Bosnia and Herzegovina (BIOSPELD), Croatian Biospeleological Society (CBSS) and representatives of the municipality of Bosansko Grahovo.

Research encompassed physical prospecting of all cave channels, microclimate measurements, cave fauna collecting, photo-documentation and cave animals' macro photography. Potentially prolongation of cave channels, indicate that speleological research should be continued. Terrestrial habitats are dominant with the average temperature of 8° C, while aquatic habitats appear as small and enhanced water pools. Around 20 taxa of cave fauna was registered: Isopoda (*Alpioniscus sp.*), Acari (*Eschatocephalus sp.*), Araneae (*Parastalita sp.*, *Troglohyphantes sp.*), Pseudoscorpiones (*Chthonius sp.*, *Neobisium sp.*), Diplopoda (*Brachydesmus sp.*), Collembola (*Pseudosinella sp.*), Coleoptera (*Parapropus sp.*, *Duvalius sp.*, *Laemostenus sp.*), Orthoptera (*Troglophilus sp.*) and representatives of the bat fauna (Chiroptera).

Cave is the type locality of *Hadzinia karamani* (Opiliones: Nemastomatidae), which specimens has been found in the cave during the research for the first time after 1935 Year. Still, during the preliminary analyses some taxa new for the science were isolated from the collected material. Rich photo documentation has been collected, including some valuable *in situ* photographs. Future research is planned through the expert work on the collected material and further speleological and biospeleological research of the Ledenica cave and other caves in Resanovac region.

A 53 Genus *Leptomastax* Pirazzoli, 1855 (Coleoptera: Scydmaenidae) in the area of SE Europe

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Among the 23 species of endogenous genus *Leptomastax* (Coleoptera: Scydmenidae), six species are known from southeast Europe: Croatia, Bosnia & Herzegovina, Serbia, Montenegro, Macedonia and Albania. These are: *Leptomastax stussineri* Reitter, 1880, *L. bipunctata* Reitter 1881, *L. macedonicus* Z. Karaman, 1962, *L. simonis* Stussiner, 1880, *L. mehadiensis* Frivaldszky, 1880 with two subspecies and *L. hypogea* Pirazzoli, 1855. Some of these species are described from the southeast Europe and are endemic for the region. During the recent research new findings of this rare genus have been recorded. The poster depicts distribution maps of the old and new findings along with new biogeographical data of this genus.

A 54 Contribution of the ecological network NATURA 2000 to the conservation of Croatian entomofauna

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The Birds Directive and the Habitats Directive represent the legal basis for the creation of a Europe-wide ecological network of nature conservation sites – the NATURA 2000 network. This network is designed to conserve over a thousand rare and threatened species and some 230 natural and semi-natural habitats listed in the annexes of the two Directives.

Three taxonomical insect groups, represented in the Annex II of the Habitats Directive, are distributed in Croatia, each of them with certain number of species (11 species of Lepidoptera, 5 species of Odonata and 8 species of Coleoptera). Furthermore, as a part of its negotiation platform for the Chapter 27 – Environment, the Republic of Croatia has proposed amending the HD Annex II with two insect species (*Proterebia afra dalmata*, Lepidoptera and *Pachytrachis bosniacus*, Orthoptera). After joining the EU, Croatia will have to designate sites for each of these species and carry out the appropriate assessment for all plans and projects likely to adversely affect sites' conservation objectives.

Preparation of the NATURA 2000 proposal is within the responsibility of the State Institute for Nature Protection as a central institution for expertise work of nature conservation in Croatia. It has been prepared based on the best available scientific data and expert knowledge in cooperation with scientific institutions, individual experts and NGOs. In this poster we present the current version of NATURA 2000 proposal in regard

to Croatian entomofauna species listed in the Annex II. Background studies for entomofauna have been done by the experts from the Croatian Natural History Museum, Faculty of Forestry, Faculty of Science, Association for Biological Research – BIOM, Croatian Biospeleological Society, University of Josip Juraj Strossmayer, Arka Arka private institute and Croatian Odonatological Society *Platycnemis*. Some additional researches are underway and gathered data will be included in the final proposal of NATURA 2000 network.

A 55 Distribution and morphology of subterranean genera *Leptodirus* Schmidt, 1832, *Leptomesson* Jeannel, 1924 and *Antroherpon* Reitter, 1889 (Coleoptera, Cholevidae) in Croatia

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In terms of global biospeleological diversity, the karstic area in Croatia is regarded as a hotspot. This area is extremely rich in, among others, various species of subterranean beetles. There are four subspecies of the first discovered cave beetle, *Leptodirus hochenwartii*, which inhabit different areas of Croatia. Genus *Leptomesson* is still being systematically investigated with new species being discovered and waiting to be described. Genus *Antroherpon* is represented with the species *A. matulici* and two subspecies of *A. apfelbecki*. Long-term research, which includes cooperation with some of the world known coleopterists, will give us an insight in their distribution. In this poster presentation we give distribution maps for subterranean genera *Leptodirus*, *Leptomesson* and *Antroherpon* in Croatia. Since all species of these genera show clear troglomorphic adaptations to subterranean environments we also show their basic morphological characters and emphasize the main differences. Considering that studied area, Croatian karst and Dinarids in general, is rich in caves and pits and that new ones are constantly being discovered, results are far from conclusive and the research continues.

A 56 A Preliminary Checklist of Caddisflies (Insecta: Trichoptera) of Bosnia and Herzegovina

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A preliminary survey on Trichoptera of Bosnia and Herzegovina is presented. A total of 215 species are recorded, representing 18 families and 74 genera. Of these, 13 species

are endemic for Bosnia and Herzegovina. The most diverse family is Limnephilidae with 71 species, followed by Rhyacophilidae (23 species), Leptoceridae (18 species) and Hydropsichidae (17 species).

A 57 State of research of dragonflies (Odonata) of the Karlovac County, Croatia with special reference to the Natura 2000 species

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Karlovac County is situated in the central part of Croatia. It occupies an area of approximately 3.622 km² and it spreads over the four river basins (Kupa, Dobra, Korana and Mrežnica), heavily forested mountain ranges of Velika Kapela and Mala Kapela, as well as Kordun karst region. In spite of the fact that more than two thirds of species recorded for Croatia were recorded for Karlovac County, preliminary analysis of published records has shown small number of records and also uneven temporal distribution of dragonfly records throughout the analyzed territory. The most unexplored part of the Karlovac County appears to be the ethno-geographic region of Kordun to which future research has to be primarily oriented. The main aim of this preliminary analysis was to provide an insight into the published, as well as the author's unpublished records of dragonflies of Karlovac County what will result in the first checklist of dragonfly species for that region. Secondly, preliminary analysis has revealed extremely small number of records of the three Natura 2000 species: *Cordulegaster heros*, *Leucorrhinia pectoralis* and *Ophiogomphus cecilia*, so in the future investigations we expect to find additional localities where they occur. Also, we expect to discover other Natura 2000 species (e.g. *Coenagrion ornatum*, *Leucorrhinia caudalis*, *Gomphus flavipes*) in the region. The presented synthesis will contribute to the overall knowledge of the Croatian dragonfly fauna by providing new records, and thus filling the gaps in general knowledge of recent state of dragonfly fauna of Karlovac County.

A 58 Contributions to the knowledge of the dragonfly fauna (Insecta, Odonata) of Vugrovec area, Zagreb

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The fauna of City of Zagreb was investigated during the past centuries what is evident by a series of publications. Even so, only a limited data about the fauna of dragonflies of

Zagreb was published, without any current checklist. So far, 74 dragonflies species are known in Croatia, while in the Zagreb area 43 species are known from the literature. The aim of this study is to present new data about the dragonflies from the Vugrovec area and to contribute to first checklist of dragonflies of Zagreb. During 2009 and 2010 we conducted the survey of dragonfly and damselfly fauna (Insecta, Odonata) in Vugrovec village, located on the eastern slopes of Mt Medvednica. Vugrovec is located 15 km from the center of Zagreb and is situated on a peripheral part of the city. Two streams flow through the village, Vugrovec and Goranec, and they represent the only suitable habitats for dragonfly development. Dragonflies are caught with entomological net within 3 km radius around the streams. Only adult dragonflies were collected when 100 specimens were caught, belonging to 13 different species. The suborder Zygoptera was represented by 4 families and 5 species, while the suborder Anisoptera was represented by 3 families and 8 species. Family Libellulidae was the most numerous family, with 3 genera and 6 species, which represents 50% of all recorded species. Among collected species two are listed in the Red Data Book of Dragonflies of Croatia.

A 59 Distribution of *Graphoderus bilineatus* (De Geer, 1774) in Croatia – first results

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The dytiscid water beetle *Graphoderus bilineatus* (De Geer, 1774) is one of few beetles protected by the European Habitats Directive (Annex II and IV of Council Directive 92/43/EEC) as well as by Bern Convention (Annex II), and is listed in the IUCN Red List of Threatened Species. It is a west Palaearctic species, distributed from Central Europe to western Siberia and from southern Scandinavia to northern parts of Southern Europe. However, in most European countries the species is very rare and West and Central European populations are strongly declining. So far, only two old records are known in Croatia (1907 Paukovec and 1943 Migalovci). During 2010 we conducted a survey at these two old known and three new potential localities for the species occurrence in order to designate Natura 2000 sites for the species. In total, 35 sampling sites were selected. In addition to sampling by pond-net, two bottle traps with bait were placed at each site. We discovered two new populations of *G. bilineatus* and collected information on distribution and habitat of this species in Croatia. Populations of *G. bilineatus* were recorded at 14 sampling sites along the natural wetlands of Lonjsko Polje and Kopački Rit Nature Parks (total number of specimens = 53). On the other hand, in the flooded forest of Spačva basin, or at the old known localities we have not found any specimens of *G. bilineatus*. Majority of specimens occurred in flood-meadows and in canals or oxbows with stagnant waters with riparian and aquatic vegetation of medium density.

Only a few specimens were found in fishponds and temporary ponds. In order to designate areas where *G. bilineatus* potentially occurs, a predictive distribution model was created. Based on our results and observations, the estimated number of areas where it potentially occurs could be much higher.

A 60 The predation potential of *Laccophilus poecilus* (Coleoptera: Adephaga) on mosquito larvae *Culex pipiens*

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Increasing negative impact of pesticides on the environment and habitats of various animal species, has forced scientists and researchers to find and improve some alternative solutions. One of the most important alternatives to pesticides is certainly biocontrol of pest species with its natural predator. The water beetle *Laccophilus poecilus* Klug, 1834 (Coleoptera: Adephaga) is a common member of the freshwater insect communities of the Danube floodplain Kopački rit in the northeast of Croatia. This insect is established predator of dipteran larvae and other organisms. The experiment of his predation potential was made using mosquito larvae of *Culex pipiens* Linnaeus, 1758 in the laboratory. It was revealed that a single adult could consume 2-42 fourth-instar mosquito larvae per day. Since individuals were not fed for 24 hours before the experiment, the expected number of individually consumed mosquitoes in the first day was the highest (between 42 and 23 larvae). After that, the number of the consumed larvae is reduced. During seven days of the experiment, individuals have altogether consumed 550 mosquito larvae and each individual consumed on average 10.172 mosquito larvae. By adjusting the theoretical function to the results, best results were obtained using the fourparameters logistic function and determined that predation potential is three larvae per day. However, it should take into account that this was an experiment which was done under controlled conditions, with always the same amount of food, so this form of biocontrol should be additionally researched in the field. Although, it can be assumed that this species play an important role in larval population regulation of mosquitoes and thereby effect on species composition and interactions in the aquatic insect communities of the wetlands.

A 61 Larval community structure and emergence of mayflies at Plitvice Lakes NP, Croatia

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Mayflies are often used in bioassessment and monitoring of freshwater bodies because of their relative abundance in a wide variety of substrates and their sensitivity to pollution. Previous research on mayflies at the Plitvice Lakes NP considered only the larval stage while there were no data on their emergence. The goal of this research was to determine larval and adult abundance, community composition, phenology, and substrate and current velocity preference at Bijela Rijeka and Crna Rijeka springs. Sampling was conducted monthly from February 2007 till February 2008. The more shaded Crna Rijeka spring had a higher number of species and higher larval abundance, while more adults emerged at the open canopy Bijela Rijeka spring. Overall, four species were found as larvae, of which *Baetis rhodani* whose larvae preferred moss substrates was the most abundant. Other taxa showed no significant preferences towards particular substrate. In emergence traps we recorded only two species, *B. rhodani* and *Rhitrogena semicolorata*. *B. rhodani* had two generations per year, first was from April until August, and second in late autumn (October-November) while emergence of *R. semicolorata* was from May until August. In *B. rhodani* males and females emerged at the same time but with greater female abundance, while in *R. semicolorata* male emergence began one month earlier. The current study provides an important contribution to the knowledge of mayfly ecology in karstic freshwater habitats that forms a basis for further investigation and monitoring of mayflies in this area.