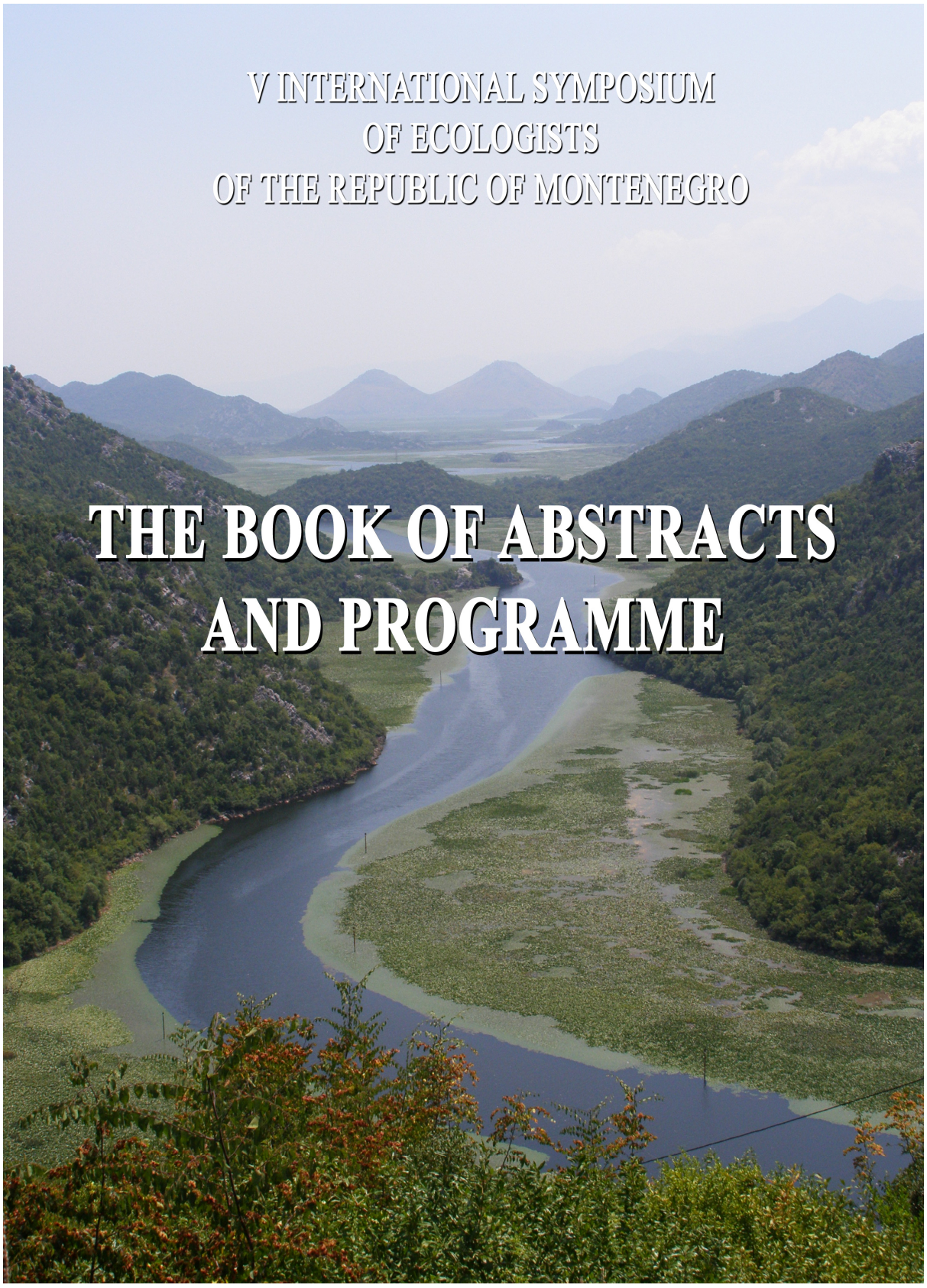
V INTERNATIONAL SYMPOSIUM
OF ECOLOGISTS
OF THE REPUBLIC OF MONTENEGRO



THE BOOK OF ABSTRACTS AND PROGRAMME

V INTERNATIONAL SYMPOSIUM OF ECOLOGISTS OF THE REPUBLIC OF MONTENEGRO

ISEM5

THE BOOK OF ABSTRACTS AND PROGRAMME

Hotel PALMA, Tivat, 02-05. 10. 2013

PUBLISHER
Department of Biology, University of Montenegro – Podgorica
Natural History Museum of Montenegro – Podgorica
Institute for Marine Biology, University of Montenegro – Kotor
Centre for Biodiversity of Montenegro – Podgorica

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CITATION
Pešić, V. (Ed.) The Book of Abstracts and Programme, V International Symposium of Ecologists of Montenegro, Tivat, 02-05.10.2013.

Cover page
Front: River Crnojevića (Skadar lake), view from Pavlove strane. Photo: V. Pešić. Back: *Ramonda serbica* Pančić, *Karucia sublacustrina* Glöer & Pešić, *Isoperla pesici* Murányi.

Printed in 250 copies.

Podgorica, October 2013.

CIP - Каталогизација у публикацији
Национална библиотека Црне Горе, Цетиње

ISBN 978-86-908743-4-7 (Centre for Biodiversity of Montenegro)
COBISS.CG-ID 22867216

Foreword

To Tivat and back – reflections on ISEM.

When delegates gathered for the first ISEM meeting in Tivat in 2004 some of them were uncertain about this new venture and how it would work out. An International Symposium of Ecologists of Montenegro in a small, little known country on a rather specialist topic? This was something not attempted before. They needn't have worried!

These meetings have been marked by their friendliness and informality, in addition to providing a platform for the exchange of information. They have also been international, (not the "International participation" often advertised) with a good mix of people from all over the world, all of whom seemed to have got on well together.

The aim was to learn more about the natural history and ecology of the Balkan area of Europe and especially Montenegro and at the same time give people the opportunity to see something of this beautiful country. Following Tivat we met in Kotor in 2006, a very special place, a world heritage site with an important fjord, a wonderful town with cobbled streets and an enormous history. ISEM 3 was held in Bijela, close to Herceg Novi, in 2008 and then in Budva. This year it has returned to Tivat.

The format has remained largely the same – Plenary lectures from invited speakers, oral presentations and poster sessions with some 'Round table' discussion. The programme at each meeting has included sessions on the protection of the environment, bio and geodiversity, terrestrial and aquatic ecosystems, ecology of populations, agroecology, biospeleology and environmental education.

Now we have reached ISEM5 and there is an opportunity to look back at the importance and success of these meetings. All of them have been important for different reasons. They have brought scientists together from different parts of the world to discuss their special interests and findings, often issues relevant to the Balkans, and through both formal and informal discussion, they have produced new ideas and collaborations for the future. As well as this, they have been useful in training young scientists to present their findings to a wider audience.

We congratulate and thank Vladimir Pešić and his team for bringing us together in a relaxed atmosphere, making lasting friendships, giving us new ideas, and providing us with much new information. It was a bold move in the first place but the meetings have been efficiently organized and a great success.

R. A. (Sandy) Baker.
Member of the Scientific Committee.

Scientific Committee:

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Dr Igor Dovgal (Kiev)
Dr Reinhard Gerecke (Tübingen)
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Organizing committee:

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Dr Dragana Milošević
Dr Danka Petrović

ISEM5 Programme

1st Day Wednesday, October 2

10^{00}-12^{00} OPENING CEREMONY

10^{00}-11^{00} Welcome words from the representatives Montenegrin authorites and from Scientific and Organizing Committee

GENERAL TIME SCHEDULE

Wednesday 02.10	Official Opening Ceremony Oral presentations Poster session	11^{00}-12^{00} 15^{30}-17^{40} 17^{30}-20^{00}
Thursday 03.10	Plenary lectures Oral presentations I Poster session I Oral presentations II Poster session II	09^{30} -10^{10} 10^{30} -12^{00} 12^{00} -15^{00} 15^{30}-16^{30} 16^{00}-19^{00}
Friday 04.10	Oral presentations I Poster session I Oral presentations II Poster session II	10^{00} -11^{30} 11^{00} -14^{00} 15^{30}-16^{00} 16^{00}-19^{00}
Saturday 05.10	Oral presentations I Poster session II Poster session II Plenary lectures Oral presentations I Poster session III Gala Dinner	09^{30} -10^{10} 12^{00} -14^{00} 15^{00} -17^{00} 15^{30} -16^{10} 16^{30} – 18^{00} 17^{00} – 19^{00} 20^{30}
Sunday 06.10	Deapartures	

Oral presentations programme

Wednesday 02.10 **15^{30}-18^{00}**	Terrestrial and aquatic ecosystems
Thursday 03.10 **10^{30}-12^{00}** **15^{30}-16^{10}**	Conservation of Biodiversity and Geodiversity Ecological Education & Ecology and NGO
Friday 04.10 **10^{00}-11^{10}** **15^{30}-16^{00}**	Protection of the Environment and Urban Ecology Advances in Biospeleological studies of Balkan peninsula
Saturday 05.10 **10^{30}-11^{00}** **16^{30}-16^{50}**	Ecology of Populations and communities Agroecology

Poster session Program

Wednesday 02.10	**Thursday 03.10**	**Friday 04.10**	**Saturday 05.10**
	Terrestrial and Aquatic ecosystems (II part) **12^{00}-15^{00}**	● Ecology and NGO & Ecological Education ●Protection of the Environment (I part) **11^{00} – 14^{00}**	Ecology of Populations **12^{00}-14^{00}**(I part) **15^{00}-17^{00}**(II part)
Terrestrial and Aquatic ecosystems (I part) **17^{30} – 20^{00}**	● Conservation of Biodiversity and Geodiversity **16^{00} – 19^{00}**	● Protection of the Environment (II part) **16^{00} – 19^{00}**	Agroecology **17^{00} – 19^{00}**

ISEM5 Programme (Detailed)

Wednesday, October 2

Terrestrial and aquatic ecosystems

15^{30}-17^{30} : Oral presentations

(Chairman: Carmen Gache and Spase Shumka)

15^{30}-15^{40} : Nuša Cukrov, Delko Barišić, Beatrix Heller, Sonja Lojen & Neven Cukrov: IMPORTANCE OF REPRESENTATIVE SEDIMENT SAMPLE FOR ENVIRONMENTAL INTERPRETATION: A CASE STUDY IN THE LAKE VISOVAC, KRKA RIVER, CROATIA

15^{40}-15^{50}: Gorbunov M.Yu. & Umanskaya M.V.: FACTORS SHAPING THE COMPOSITION OF PHOTOTROPHIC COMMUNITIES IN MEROMICTIC FRESHWATER LAKES

15^{50}-16^{00} : Umanskaya M.V., Krasnova E.S. & Gorbunov M.Yu.: THE SEASONAL AND ANNUAL DYNAMICS OF PHOTOTROPHIC PLANKTON COMMUNITIES FROM THE SMALL URBAN MEROMICTIC POND

16^{00}-16^{10} : Sead Hadžiablahović: FLORA OF SKADAR LAKE NATIONAL PARK

16^{10}-16^{20}: Gabriela Costea: PROTECTED SPECIES OF DRAGONFLIES (INSECTA: ODONATA) AND MAYFLIES (INSECTA: EPHEMEROPTERA) IN THE LOWER PRUT FLOODPLAIN NATURAL PARK ROMANIA

16^{20}-16^{30}: Tatjana Babović-Jakšić, Nebojsa Živić & Nenad Labus: THE COLLEMBOLA FAUNA OF DIFFERENT MICROHABITATS OF BECICI BEACH, MONTENEGRO

16^{30}-16^{40}: Jerina Kolitari, Sokol Duro, Alfred Caushi, Arjan Demiri, Roland Kristo & Jerina Vukaj: EVALUATION OF ACUGA (*ENCHRAULIS ENCHRASICHOLUS*) POPULATION STRUCTURE BY LENGTH AND AGE INDICATORS

16^{40}-16^{50}: Spase Shumka, Pellumb Aleksi, Odd Terje Sandlund, Arefi Cake & Sotir Mali: IMPLEMENTING THE EUROPEAN FISH INDEX (EFI) FOR ASSESSMENT OF THE STATE OF CENTRAL ALBANIAN RIVER SYSTEM

16^{50}-17^{00}: Sokol Duro, Jerina Kolitari, Neira Medja, Alfred Caushi & Arjan Demiri: EVALUATION OF SARDINE *(SARDINA PLICHARDUS)* POPULATION STRUCTURE BY LENGTH AND AGE INDICATORS

17^{00}-17^{10}: Dijana Blažeković Dimovska, Stojmir Stojanovski & Nikola Hristovski: PARASITE FAUNA OF ENDEMIC FISHES (*SALMO LETNICA* Karaman, 1924 and *SALMO OHRIDANUS* Steindachner 1892) FROM LAKE OHRID (MACEDONIA)

17^{10}-17^{20}: Carmen Gache: HABITATS' EVOLUTION AND BIRDS FAUNA'S DIVERSITY IN THE JIJIOARA RIVER BASIN (ROMANIA)

17^{20}-17^{30} : Jamarber Malltezi, Ardian Shehu, Lirim Selfo & Sulejman Sulce: ECOLOGICAL CONSIDERATION IN SUSTAINABLE HYDROPOWER DEVELOPMENT IN ALBANIA: THE CASE OF ASHTA HYDRO POWER PLANT IN SHKODRA, ALBANIA

Wednesday, October 2, 17^{30} – 20^{00} : Poster presentations (1 – 25)

1. Adriana Zyfi, Spiro Grazhdani & Alma Ahmeti: MODELING WATER QUALITY IN THE LAKE SHKODRA USING CE-QUAL-W2 MODEL

2. Rahman Ferizi & Klementina Puto: PRELIMINARY DATA ON MICROBIOLOGICAL QUALITY ASSESSMENT IN DIFFERENT FISH SPECIES FROM LUMBARDHI RIVER, KOSOVO
3. Mateusz Płóciennik, Ioannis Karaouzas, Olga Antczak & Daria Baradyn: THE CHIRONOMIDAE (DIPTERA) FAUNA OF GREECE: ZOOGEOGRAPHICAL DISTRIBUTIONS AND NEW RECORDS
4. Mateusz Płóciennik, Piotr Gadawski & Jacek Kazimierczak: NEW SPECIES OF NON-BITING MIDGES (DIPTERA, CHIRONOMIDAE) FOR COASTAL REGIONS OF CROATIA AND MONTENEGRO
5. Marsela Bitri, Spiro Grazhdani & Alma Ahmeti: TEST AND VALUDATION OF AQUA-CROP MODEL IN SIMULATING CANOPY COVER, BIOMASS AND GRAIN YIELD OF IRIGATED AND WATER DEFICIENT FIELD MAIZE
6. Skerdilaid Xhulaj: COMPOSITION AND SEASONAL VARIATION OF PHYTOPLANKTON COMMUNITY UPSTREAM OF DEVOLLI RIVER (EASTERN ALBANIA)
7. Vera D. Vukanić, Nebojiša V.Živic & Tatjana R. Jakšić: HYDROGRAPHIC AND ZOOPLANKTON DATA IN THE BAY OF KOTOR COLLECTED DURING 2007/08
8. Elizabeta Veljanoska-Sarafiloska, Suzana Patceva & Lence Lokoska: TROPHIC STATUS OF RESERVOIR "STREZEVO", REPUBLIC OF MACEDONIA
9. Eltjon Halimi, Anila Paparisto & Dritan Topi: TERRESTRIAL MACROINVERTEBRATES OF SEED BUGS (LYGAEIDAE HEMIPTERA) IN DIFFERENT ECOSYSTEMS
10. Enkeleda Ozuni, Luljeta Dhaskali, Edmond Zaimi, Kastriot Belegu, Jetmira Abeshi, Albana Munga & Ilir Dova: LEVELS OF HEAVY METALS (MERCURY, LEAD, CADMIUM AND CHROME) IN DIFFERENT TISSUES OF TWO BENTHIC FISH SPECIES OF ADRIATIC SEA
11. Gaponova Liudmyla: THE SEASONAL POPULATION DYNAMICS OF THE CENTROHELID AND ACTINOPHRYID HELIOZOANS (CENTROHELIDA, ACTOPHRYIDA) IN ARTIFICIAL POND (UKRAINE)
12. Suzana Golemi, Donalda Lacej, Djana Muriqi & Rudina Meraja: SEASONAL CHANGES ON HEMATOLOGIC AND BIOCHEMICAL PARAMETERS OF *CYPRINUS CARPIO* (LINNAEUS, 1758) IN NATURAL CONDITIONS
13. Gordienko A.P.: THE ROLE OF BACTRERIOPLANKTON IN FUNCTIONING OF MARINE ECOSYSTEM
14. Dafina Guseska, Orhideja Tasevska, Goce Kostoski & Dimitar Guseski: BIOMASS OF PELAGIC CRUSTACEA: CLADOCERA IN THE LAKE OHRID (MACEDONIA) FOR THE PERIOD 2000-2009
15. Etleva Hamzaraj & Roxhensa Kreçi: SOME MONITORING DATA ON BACTERIAL LOAD OF DEVOLLI RIVER, ALBANIA
16. Arviola Hodaj, Alma Shehu & Besnik Baraj: A PRELIMINARY ASSESSMENT ON SEASONAL VARIATIONS OF QUALITY INDICATORS OF TIRANA LAKE
17. Olivera Marković, Zdravko Ikica, Ana Pešić, Aleksandar Joksimović, Mirko Đurović & Milica Mandić: LENGTH-WEIGHT RELATIONSHIP AND CONDITION FACTORS OF THE BOGUE, BOOPS BOOPS (LINNAEUS, 1758) IN SOUTH ADRIATIC SEA (MONTENEGRO)
18. Denada Kasemi, Stela Ruci & Sajmir Beqiraj: DATA ON MACROZOOBENTHOS OF THE RADHIMA COAST, VLORA BAY, ALBANIA

19. Liljana Kola & Enver Hoxhaj: MİNİMUM LİMİT DETECTİON OF RHODAMİNE WT AND SRG EXTRA BY SYNCHRONOUS SCAN METHOD
20. Adela Kullaj & Margarita Hysko: TASTE AND ODOR EPISODES IN WATER OF BOVILLA RESERVOIR USED FOR THE WATER SUPPLY OF TIRANA
21. Eltjon Halimi, Anila Paparisto, Dritan Topi & Kastriot Misja: DATA ABOUT FAMILIE MIRIDAE (HEMIPTERA) IN DIFFERENT HABITATS OF ALBANIA CENTRAL
21. Laura Shumka: CONSIDERING IMPORTANCE OF LIGHT IN THE POST-BYZANTINE CHURCH IN CENTRAL ALBANIA
22. Sotir Mali, Spase Shumka & Margarita Hysko: IN WHAT LEVEL IS THE WATER QUALITY OF OHRID LAKE (ALBANIAN PART) COMPARED TO THE INTERNATIONAL STANDARDS?
23. Mandić M., Regner, S., Joksimović, A. & Pešić A.: SPAWNING OF SARDINE, *Sardina pilchardus* (Walb.) IN BOKA KOTORSKA BAY (SOUTH ADRIATIC SEA)
24. Goran Marković, Vesna Đikanović, Stefan Skorić & Jelena Lujić: NEW MEMBERS OF THE ZAPADNA MORAVA RIVER ICHTHYOFAUNA (SERBIA)
25. Nevila Bushati, Fiqiret Bushati & Margarita Hysko: IDENTIFICATION OF BACTERIAL OPPORTUNISTIC SPECIES THROUGH THE USAGE OF BIOCHEMICAL SYSTEMS API 20 E AND ENTEROPLURI AT SHKODRA/SKADAR LAKE

Thursday, October 3, 12^{00} – 15^{00} : poster presentations (26-53)

26. Aurel Nuro, Elda Marku, Kujtim Dule & Alda Kika: AN EVALUATION OF ORGANCHLORINATED POLLUTANTS IN CENTRAL ALBANIA
27. Olga Olkhovich, Natalia Taran, Olena Patsko & Inna Kravchenko: ASSESSMENT OF POTENTIAL HAZARDS OF BIOGENIC METAL NANOPARTICLES TO AQUATIC PLANTS
28. Patceva, S., Veljanoska-Sarafiloska, E. & Lokoska, L.: INVESTIGATIONS OF THE LOADING RATE IN THE COURSE OF RIVER VELGOSHKA AND ITS INFLUENCE ON THE TROPHIC STATE OF LAKE OHRID
29. M.K. Patsyuk: TOLERANCE OF NAKED AMOEBAS TO THE ABIOTIC FACTORS OF WATER ENVIRONMENT
30. Danijela Prodanović, Zoran Krivošej & Lidija Amidžić: FLORISTIC AND CHOROLOGICAL NEWS FROM NORTHERN KOSOVO, IN THE IBAR RIVER VALLEY
31. N.K.Revkov: THE LONG-TERM CHANGES OF THE SOFT-BOTTOM ZOOBENTHOS AT COASTAL ZONE OF THE WESTERN CRIMEA (THE BLACK SEA)
32. Mirela-Sabina Ridiche & Attila D. Sándor: ANALYSIS OF THE DATA REGARDING THE RINGED BIRDS RECOVERED IN SOUTHWESTERN ROMANIA (DOLJ COUNTY)
33. Lence Lokoska, Simon Lokoski & Kristijana Kipeska: MICROBILOGICAL INVESTIGATIONS IN THE PELAGIC ZONE OF LAKE OHRID
34. Lence Lokoska, Simon Lokoski & Kristijana Kipeska: BACTERIAL ASSESMENT OF GROUND WATER AT OHRID CITY
35. Slavica Petović & Dragana Drakulović: OCCURRENCE OF ENDEMIC ECHINODERMS IN THE BENTHIC COMMUNITIES ON SHELF OF THE MONTENEGRIN COAST
36. Sorin Trelea & Alina Elena Ignat: THE CURRENT SITUATION OF BIRD COLONIES IN THE DANUBE DELTA (ROMANIA)
37. Alma Shehu, Arben Pambuku & Aranit Gelaj: ESTIMATION OF OCCURRENCE AND SPATIAL DISTRIBUTION OF HEAVY METALS IN OHRID AND PRESPA LAKE, ALBANIA

38. Simina Stanc & Mariana Popovici : MAMMAL'S HUSBANDRY IN THE IV-XTH CENTURIES SETTLEMENTS FROM EASTERN ROMANIA
39. Simina Stanc: DIVERSITY OF THE WILD MAMMALS, HUNTED IN THE BRONZE AGES SETTLEMENTS ON THE ROMANIA`S TERRITORY
40. Talevski Trajce: DYNAMIC OF THE POPULATION OF THE PRESPA BELVICA *Alburnus prespensis* -Karaman 1924 FROM LAKE PRESPA
41. Marina Talevska: PRELIMINARY RESEARCHES OF AQUATIC VEGETATION IN REED BEDS FROM LAKES PRESPA
42. Anita Tosheva & Ivan Traykov: AQUATIC MACROPHYTES COMPOSITION IN LENTIC WATER BODIES – COMPARISON BETWEEN THE ECOREGIONS IN BULGARIA
43. Teodora Stoyanova, Ivan Traykov, Valentin Bogoev, Ivanka Yaneva, Yanka Vidinova, Violeta Tyufekchieva & Lubomir Kenderov: COMPOSITION OF THE MACROZOOBENTHOS IN SEMI-MOUNTAINOUS RIVER IN SOUTH-WESTERN BULGARIA
44. Viola Prifti & Arefi Cake: DECLINE OF THE OHRID TROUT POPULATIONS DUE TO LACK OF FISH STOCK MANAGEMENT AND OVERFISHING
46. Skerdilaid Xhulaj: COMPOSITION AND SEASONAL VARIATION OF PHYTOPLANKTON COMMUNITY UPSTREAM OF DEVOLLI RIVER (EASTERN ALBANIA)
47. Denisa Žujo Zekić, Aida Abaza & Aida Pelo: MORPHOLOGICAL AND ENVIRONMENTAL CHARACTERIZATION OF POPULATION OF WHITE-CLAWED CRAYFISH – *Austropotamobius pallipes* (Lereboullet, 1858) IN BUNA RIVER
48. Nebojša V. Živić, Tatjana Jakšić, Nenad Labus & Slavica Tomić: ECOLOGICAL DEPENDANCE OF BOTTOM MACROINVERTEBRATES FAUNA DISTRIBUTION IN TRNAVSKA RIVER, SERBIA
49. Nebojša V. Živić, Tatjana Jakšić, Vera D. Vukanić & Slaviša Milošević: THE DISTRIBUTION OF ASTACIDAE (DECAPODA) FAUNA IN KOSOVO AND METOHIJA, SERBIA
50. Predrag S. Vasić, Zoran DJ. Krivošej, Marina D. Topuzović, Darko V. Dubak & Danijela T. Prodanović: MORPHOLOGICAL – ANATOMICAL CHARACTERISTICS OF TWO COMMON JUNIPERS (JUNIPERUS COMMUNIS AND JUNIPERUS OXYCEDRUS) FROM THE AREA OF MOUNTAIN KOPAONIK
51. Stojmir Stojanovski, Lidija Velkova-Jordanovska, Dijana Blažeković-Dimovska, Stoe Smiljkov, Nikola Hristovski & Olga Rusinek: PARASITE FAUNA OF *CHONDROSTOMA NASUS* (LINNAEUS, 1758) FROM LAKE OHRID (MACEDONIA)
52. N.V. Shadrin: MULTIPLICITY OF ECOSYSTEM STABLE STATES AND SLEEPING BIODIVERSITY: TOWARDS A DEEPER UNDERSTANDING OF BIODIVERSITY DYNAMICS
53. Elena Anufriieva: UNIQUE ECOSYSTEMS OF EXTREME HABITATS: A CASE OF ATALASSOHALINE HYPERSALINE LAKES IN THE CRIMEA
56. Cecilia Şerban & Mihaela Cristescu: RARE SPECIES OF INSECTS IN ANTHROPOGENIC ECOSYSTEMS

Thursday, October 3

Conservation of Biodiversity and Geodiversity

Plenary lectures:

09^{30}-10^{10} : Tomasz Mamos, Michal Grabowski, Remi Wattier, Karolina Bacela-Spychalska & Tomasz Rewicz: FORGET PLEISTOCENE! TETHYS-PARATETHYS REGRESSIONS AND ALPIDE OROGENY PRODUCED *Gammarus* DIVERSITY IN EUROPEAN FRESHWATERS

(Chairman: Igor Dovgal)

10^{30}-12^{00} : Oral presentations

(Chairman: Svitlana Ziman and Michal Grabowski)

10^{30}-10^{40}: S. Ziman & M. Derbak: ABOUT THE CONSERVATION OF THE RARE VASCULAR PLANTS WITHIN THE "HOT SPOTS" IN THE HIGH MOUNTAINS OF THE UKRAINIAN CARPATHIANS

10^{40}-10^{50}: Iryna Dudka: CONSERVATION OF THE ENDANGERED FUNGI AND FUNGI-LIKE ORGANISMS IN UKRAINE

10^{50}-11^{00}: Anna Kuzemko: CONSERVATION OF MEADOW VEGETATION OF THE FOREST AND FOREST-STEPPE ZONES OF UKRAINE IN SITU AND EX SITU

11^{00}-11^{10}: Škrijelj, R., Đug, S. & Drešković, N.: THE RED LIST OF THE FLORA, THE FAUNA AND FUNGI IN THE FEDERATION OF BOSNIA AND HERZEGOVINA

11^{10}-11^{20}: Tomasz Rewicz, Remi Wattier, Karolina Bacela-Spychalska, Michal Grabowski & Thierry Rigaud: TWENTIETH ANNIVERSARY OF *Dikerogammarus villosus* IN WESTERN EUROPE - PHYLOGEOGRAPHY OF THE INVADER

11^{10}-11^{20}: Anna Wysocka, Michał Grabowski, Lidia Sworobowicz, Tomasz Mamos, Adrianna Kilikowska & Jerzy Sell: GENETIC DIVERSITY AND EVOLUTIONARY HISTORY OF THE LAKE OHRID *Gammarus* SPECIES FLOCK

11^{20}-11^{30}: Daria Baradyn, Mateusz Płóciennik & Nataša Popović: NON-BITING MIDGES (CHIRONOMIDAE) OF SERBIA – REVIEW OF THE MIRJANA JANKOVIĆ STUDIES

11^{30}-11^{40}: Radomir Jaskuła, Mateusz Płóciennik, Bartosz Ukleja, Maciej Podsiadło & Natalia Gawryś: GENERALISTS OR SPECIALISTS – DO TIGER BEETLES ADOPT THE SAME STRATEGY ACCORDING TO HABITAT TYPE IN DIFFERENT PART OF THE MEDITERRANEAN REGION?

11^{40}-11^{50}: Radomir Jaskuła, Tomasz Rewicz & Michał Grabowski: PLEISTOCENE SEA LEVELS AND PHYLOGEOGRAPHY OF *Calomera littoralis* IN MEDITERRANEAN

11^{50}-12^{00}: Lidija Polović & Natalija Čađenović: THE HERPETOFAUNA OF KRNOVO (MONTENEGRO)

16^{00} – 19^{00}: Poster presentations (1 – 41)

1. Bălescu Carmen Daniela & Ridiche Mirela Sabina: PRELIMINARY ORNITHOLOGICAL OBSERVATIONS IN THE AREA OF URZICUTA SETTLEMENT (DOLJ COUNTY-ROMANIA)
2. Blinkova Olena: ANALYSIS OF SYNERGIES BETWEEN THE VEGETATIONAL COVER AND THE INTENSITY OF IMPACT WATER EROSION
3. Mehmeti E., Cela D., Abazi S. & Shuka L.: OPTIMIZATION OF EXTRACTION OF ALKALOIDS FROM *GYMNOSPERMIUM MALOI*, A NEW ENDEMIC SPECIES FROM ALBANIA
4. Lorena Ciko & Sokol Abazi: STUDY ON SECONDARY METABOLITES OF CULTIVATED AND WILD *SIDERITIS SCARDICA,* GROWN IN ALBANIA

5. Minela Elezović, Emina Ademović & Samir Đug: DIVERSITY OF PLANT ENDEMIC SPECIES FROM THE LOCALITIES OSANICI AND KRUZEVAC HILL (MUNICIPALITY STOLAC)
6. Đug S., Korjenić E., Trakić S. & Drešković N.: NEW HABITAT OF EUROPEAN BEAVER *CASTOR FIBER* LINNAEUS (1758) IN BOSNIA AND HERZEGOVINA
7. Vera Biberdžić & Jelena Blaženčić: CHAROPHYTES (Charales) OF ULCINJ AND VELIKA PLAŽA BEACH, MONTENEGRO
8. Ilinka Ćetković & Gordana Kasom: THE CONTRIBUTION TO THE KNOWLEDGE OF MACROMYCETES OF MONTENEGRO
9. Viorica Arcan: AVIFAUNA'S MONITORING IN SOME TERRESTRIAL ECOSYSTEMS ADJACENT OF GALATI (GALAȚI COUNTY)
10. Snežana Dragićević: CONTRIBUTIONS TO THE BRYOPHYTE FLORA OF ULCINJ, MONTENEGRO
11. Shukri Fetahu, Skender Kaçiu, Sali Aliu, Imer Rusinovci, Salih Salihu & Avni Beluli: GENETIC CHARACTERIZATION AND PHENOTYPE DIVERSITY OF COMMON BEANS LANDRACES (Pharsalus vulgaris L.) IN KOSOVA
12. Ernest Gjuraj, Sokol Abazi, Ina Veliaj & Jonida Salihila: STUDY OF THE PHYSICAL-CHEMICAL PARAMETERS OF *OLEUM HYPERICI* PRODUCED UNDER MICROWAVE EXTRACTION OF *HYPERICUM PERFORATUM*
13. Besnik Hallaçi & Lulëzim Shuka: *Allium pthioticum* BOISS. & HELDR., *Allium victorialis* L. and *Melampyrum bihariense* A. KERNER – THREE NEW SPECIES IN THE FLORA OF ALBANIA
14. Lyubov Hristova, Evelina Damyanova & Veneta Kapchina-Toteva: *EX SITU* CONSERVATION OF ENDANGERED BULGARIAN *ARTEMISIA ERIANTHA* TEN. (ASTERACEAE) BY *IN VITRO* CULTURES
14. Oleksandra Ivanenko: APHYLLOPHOROID FUNGI (BASIDIOMYCOTA) OF BIOTOPES ON KYIVSKE PLATO, UKRAINE
15. Zhenya Yordanova, Maria Rogova, Milena Dimitrova & Veneta Kapchina-Toteva: *IN VITRO* CULTIVATION AND ESSENTIAL OIL COMPOSITION OF THE BULGARIAN ENDEMIC PLANT *Achillea thracica* VELEN.
16. Branko Anđić, Snežana Dragićević & Danijela Stešević: *FISSIDENS FONTANUS* (BACH.PYL.) STEUD., NEW AQUATIC MOSS IN BRYOFLORA OF MONTENEGRO
17. Zoran Krivošej, Danijela Prodanović, Predrag Lazarević, Lidija Amidžić & Vasic Predrag: *Ophioglossum vulgatum* L. (OPHIOGLOSSACEAE) IN THE FLORA OF KOSOVO AND METOHIJA (SERBIA)
18. Mamos T., Đurić P., Žganec K. & Grabowski M.: DISTRIBUTION AND MOLECULAR DIVERSITY OF *Fontogammarus dalmatinus* S. Karaman 1931 ENDEMIC TO THE DINARIC KARST
19. Zeqir Hashani & Lulëzim Shuka: *Pulsatilla halleri* (All.) Willd. AND *Viola schariensis* Erben, NEW SPECIES FOR THE FLORA OF KOSOVO
20. Katarzyna M. Zielińska, Małgorzata Misztal & Alicja Zielińska: ESTIMATING THE IMPACT OF DITCHES' PRESENCE ON THE DIVERSITY OF FOREST FLORA
21. Mahmutaj E. & Hoda P.: PRELIMINARY DATA ON FLORISTIC RICHNESS OF SPECIES WITH ECONOMICAL VALUES IN TOMORRI NATIONAL PARK
22. Mustafa Behxhet, Hajdari Avni, Veselaj Zeqir, Beadini Nexhbedin, Ibrahimi Halil, Mustafa Ndriçim & Morina Ilir: EXTENSION OF THE NATIONAL PARK "SHARRI" BOUNDARIES, SIGNIFICANT ACTION FOR PRESERVATION OF NATURAL VALUE
23. Nataliia Pashkevich: ECOLOGICAL ASSESSMENT RUDERAL COMMUNITIES ANNUAL CEREALS KYIV REGION (UKRAINE).

24. Tomasz Rewicz, Alicja Konopacka & Michal Grabowski: FRESHWATER GAMMARIDS IN MOLDOVA
25. Malidžan Suzana & Vujić Ante: CONTRIBUTION TO THE KNOWLEDGE OF THE HOVERFLIES (DIPTERA, SYRPHIDAE) OF MONTENEGRO
26. Dorina Grazhdani: THE EFFECT OF SOCIO-ECONOMIC FACTORS AND LAND CHARACTERISTICS ON ADOPTION OF RESOURCE CONSERVING AGRICULTURAL TECHNOLOGIES: CASE STUDY OF AL-PRESPA PARK
27. Siniša Škondrić, Tatijana Figurek & Nada Šumatić: FLORA OF NASEOBINA HRVAĆANI (PRNJAVOR, NW BOSNIA AND HERZEGOVINA): ECOLOGICAL AND PHYTOGEOGRAPHICAL ANALYSIS
28. Siniša Škondrić, Dražen Janković & Nada Šumatić: FLORISTIC DIVERSITY OF DUGO POLJE (MODRIČA, NW BOSNIA AND HERZEGOVINA)
29. Valbona Sota & Efigjeni Kongjika: MICROPROPAGATION AND SLOW GROWTH *IN VITRO* CONSERVATION OF *P. avium* L. AND *P. mahaleb* L. GERMPLASM
30. Monica Luca & Simina Stanc: SUINES MIGRATIONS ON ROMANIA`TERRITORY DURING THE NEOLITHIC
31. Ariana Striniqi Laçej & Kastriot Misja: CONSIDERATION AND NEW DATA ON SCARABIDAE FAMILY (INSECTA COLEOPTERA) IN NORD ALBANIA REGION
32. Velkova-Jordanoska Lidija, Panov Sasho, Kostov Vasil, Stojanovski Stojmir & Kostoski Goce: MOLECULAR (RAPD) IDENTIFICATION OF THE FOUR SPECIES OF THE GENUS BARBUS IN LAKES AND RIVERS IN R. MACEDONIA
33. Josip Boban, Dalibor Vladović, Nediljko Ževrnja, Stjepan Mekinić & Ratko Cvitanić: RARE SPECIES IN ICHTHYOLOGICAL COLLECTION OF NATURAL HISTORY MUSEUM SPLIT
34. Nediljko Ževrnja, Božena Mitić, Dalibor Vladović, Ratko Cvitanić, Stjepan Mekinić & Josip Boban: ANALYSIS OF SOME FAMILYS FROM CARL STUDNICZKA'S HERBARIUM (IV)
35. Ratko Cvitanić, Dalibor Vladović, Josip Boban, Nediljko Ževrnja & Stjepan Mekinić: REVIEW OF CAVE BEETLE FAUNA OF DR. EDUARD KARAMAN'S ENTOMOLOGY COLLECTION OF NATURAL HISTORY MUSEUM, SPLIT
36. S. Mekinić, J. Boban, D. Vladović, R. Cvitanić & N. Ževrnja: AMPHIBIANS IN HERPETOLOGICAL COLLECTION OF NATURAL HISTORY MUSEUM SPLIT
37. Gordana Kasom & Ilinka Ćetković: *NEOLENTINUS SCHAEFFERI* (GLEOPHYLLACEAE) IN MONTENEGRO
38. Danka Caković, Danijela Stešević & Snežana Vuksanović: SOME FLORISTIC AND CHOROLOGICAL CONTRIBUTION TO THE VASCULAR FLORA OF MONTENEGRO

Ecological Education & Ecology and NGO

15^{30}-16^{10} : Oral presentations

(Chairman: Oksana Golovchenko and Eriona Alla)

15^{30}-15^{40} : Eriona Alla & Mihallaq Qirjo: DIFFERENT MODES OF INTEGRATING ENVIRONMENTAL EDUCATION INTO THE ALBANIAN EDUCATION CURRICULUM

15^{40}-15^{50} : Carmen Gache: ENVIRONMENTAL ETHIC VALUES THROUGH ECOLOGICAL EDUCATION IN ONE ROMANIAN MASTER DEGREE PROGRAMME

15^{50}-16^{00} : Golovchenko O.V. THE ROLE OF POISONOUS PLANT STUDY IN THE FORMATION OF MEDICAL STUDENT ECOLOGICAL OUTLOOK

16^{00}-16^{10} : Snezana Stavreva Veselinovska & Snezana Kirova: BLENDING THE TEACHING OF ENVIRONMENTAL MATTERS AND ENGLISH AS A SECOND OR FOREIGN LANGUAGE

Friday, October 4 : 11^{00} – 14^{00} : poster presentations

1. Branko Anđić & Desanka Malidžan: USE OF MOSS SPECIES AS A BIOLOGICAL MATERIAL IN THE TEACHING BIOLOGY AND ECOLOGY
2. Maja Kazazić, Nina Zolj, Elma Šubara & Maida Đapo: ENVIRONMENTAL EDUCATION IN PRIMARY AND SECONDARY SCHOOLS IN MOSTAR AREA
3. Odeta Laknori & Rozeta Hallulli: BIOETHICS AND ECOLOGICAL EDUCATION IN BIOLOGY CURRICULA IN MIDDLE HIGH SCHOOL IN ALBANIA
4. Naela Costica, Vasile Sirbu & Ramona Pavel: OPTIMIZING THE EDUCATIONAL PROCESS THROUGH MULTIDISCIPLINARY APPROACH TO ECOLOGICAL EDUCATION TOPICS
5. Naela Costica, Vasile Sirbu & Gheorghe Bicec: ECOLOGY AND MULTIDISCIPLINARY EDUCATION

Friday, October 4

Protection of the Environment and Urban Ecology (including: *Climate change in South-eastern European countries*)

10^{00}-11^{20} : Oral presentations

(Chairman: Kledi Xhaxhiu and Ditika Kopliku)

10^{00}-10^{10}: Alma Ahmeti & Spiro Grazhdani: THE EFFECTS OF DIFFERENT TILLAGE, CROP ROTATION AND STUBBLE MANAGEMENT ON RAINFALL INFILTRATION, SOIL PROPERTIES, AND SOIL AND NUTRIENT LOSSES

10^{10}-10^{20}: Anila Mesi (Dizdari) & Ditika Kopliku: TOXIC EFFECTS OF LEAD-DOPED WATER OF DRINI AND BUNA RIVERS ON *Allium cepa* L.

10^{20}-10^{30} : Ditika Kopliku & Anila Mesi (Dizdari): CAPABILITY OF *Allium cepa* L. ROOTS IN EVALUATING ANTAGONISTIC EFFECTS OF CA^{2+} IONS TO HAZARDOUS AL^{3+} IONS

10^{30}-10^{40} : Anila Neziri & Elda Marku: POLYCHLORINATED BIPHENYLS (PCBS) LEVELS IN DRINI RIVER SURFACE WATER TRANSBOUNDARY SYSTEM

10^{40}-10^{50} : Kledi Xhaxhiu, Jehona Shllaku, Lorenc Sula, Arjan Xhelaj & Teodor Kota: THE REMOVAL OF METRIBUZINE FROM PESTICIDE CONTAMINATED WATERS USING NATURAL AND ACTIVATED PRRENJASI-CLAY

10^{50}-11^{00} : Kledi Xhaxhiu, Lorenc Sula, Jehona Shllaku, Arjan Xhelaj & Teodor Kota: COMPARISON OF THE ADSORPTION CAPACITIES OF TWO ALBANIAN CLAYS FOR THE REMOVAL OF METRIBUZINE FROM CONTAMINATED WATERS

11^{00}-11^{10} : Gazmend Zeneli & Abdulla Diku: ENVIRONMENTAL IMPACT OF NRDP IN ALBANIA: A SMALL STEP FORWARD

11^{10}-11^{20} : Edmont Laho, Fabian Cenko, Arben Kamami: DISTRIBUTION OF IRON DEFICIENCY ANEMIA (IDA) IN A HOSPITALIZED PEDIATRIC SAMPLE (RETROSPECTIVE EPIDEMIOLOGIC STUDY 2009 – 2012)

11^{00} – 14^{00} : poster presentations (1-10)

1. Abeshi, J., Dhaskali, L., Dimco, E., Elmasllari, E. & Ozuni, E.: ACCUMULATION OF MERCURY AND LEAD AT SIX KINDS OF FISH IN DURRËS BAY

2. Blerta Laze & Anila Mitre: A COMPARATIVE ANALYSIS ON TWO DIFFERENT FULLY AUTOMATED ANTI-CYTOMEGALOVIRUS IGM IMMUNOASSAYS
3. Ariola Devolli, Arta Kodra, Mariola Kodra & Edlira Shahinasi: PROBLEMS RELATED TO IMPLEMENTATION OF ALBANIAN LEGISLATION ON WASTE MANAGEMENT
4. Elenica Dimço, Jetmira Abeshi, Vasilika Dini & Xhilda Roko: THE INFLUENCE OF ENVIRONMENTAL TEMPERATURE ON THE BLOOD PARAMETERS OF STRAY DOGS
5. Ralitsa Tsekova, Anelia Kenarova, Valentin Bogoev & Silvena Boteva: IMPACT OF URANIUM MINING ACTIVITIES ON SOIL BACTERIAL AND LUMBRICIDAE COMMUNITIES INHABITING THE MINING AREA
6. D. Petrović, S. Krivokapić & D. Jančić. CONTENTS OF HEAVY METALS (Zn, Mn, Cu) IN DIFFERENT PARTS OF *TRAPA NATANS* L. FROM SKADAR LAKE, MONTENEGRO
7. Milica Mijanović & Slađana Krivokapić: TOTAL PHENOLIC CONTENTS OF THE HONEY FROM MONTENEGRO
8. Veselinka V. Grudić, Vesna L. Vukašinović-Pešić, Nada Z. Blagojević, Snežana Brašanac & Đina Perić: ADSORPTION OF CADMIUM FROM WATER USING NEUTRALIZED RED MUD AND ACTIVATED NEUTRALIZED RED MUD
9. Kiril Lisichkov, Stefan Kuvendziev, Mahi Ljatifi & Gjorgji Zhezhov: ANALYSIS OF THE ACTIVATED SLUDGE WASTEWATER TREATMENT PROCESS BY APPLICATION OF A PROCESS SIMULATOR
10. Blagica Cekova, Suzana Temelkoska & Lence Cekova: DETERMINATION OF HEAVY METALS THAT CONTRIBUTE TO WATER POLLUTION IN MID-FLOW OF VARDAR RIVER

$16^{00} – 19^{00}$: poster presentations (11-25)

11. Dorina Grazhdani: DISCUSSING DIVERSE ISSUES AND PROSPECT FOR SUSTAINABLE SOCIAL ECONOMIC DEVELOPMENT IN PRESPA NATIONAL PARK, ALBANIA
12. Klodiola Dhamo: POSSIBILE DRUG AND FOOD INTERACTIONS IN PATIENTS TREATET IN SOME MEDICAL CENTERS OF TIRANA
13. Dražana Radonjić & Željka Đurišić: DISTRIBUTION OF LIPOLITIC BACTERIA AND IDENTIFICATION OF COLIPHORM BACTERIA IN THE WATER AT THE LOCALITY VUKOVCI AS AN INDICATOR OF THE PRESENCE OF EMERGENT SUBSTANCES IN SURFACE WATER
14. Jonida Canaj & Kozeta Vaso: EFFECT OF STORAGE TIME ON OLIVE OIL QUALITY IN ALBANIA
15. Eldi Liço, Spiro Drushku, Orela Cimbidhi & Jozefita Marku: PLASTIC WASTE MANAGEMENT IN ALBANIA AND ITS EUROPEAN PERSPECTIVE
16. Vlatko Kastratović, Slađana Krivokapić, Dijana Đurović, Nada Blagojević & Miljan Bigović: THE UPTAKE OF LEAD BY AQUATIC MACROPHYTES FROM SKADAR LAKE
17. Aferdita Laska Merkoci, Vangjel Mustaqi, Magdalena Cara, Elvin Como & Mirela Dvorani: STUDY ON VULNERABILITY OF CLIMATE CHANGE IN ALBANIA POWERED BY THE INSTITUTE OF GEOSCIENCES, ENERGY, WATER AND ENVIRONMENT
18. Lorena Hysi, Tefta Rexha & Ilda Kullolli: BONE MINERAL DENSITY AND FACTORS ASSOCIATED WITH OSTEOPOROSIS IN PRE AND POSTMENOPAUSAL ALBANIAN WOMEN

19. Vesna Markoski, Dragan Jovanov, Bojan Mitrovski & Arianit A. Reka: MONITORING OF THE QUANTITATIVE CHARACTERISTICS OF THE FEED WATERS OF THE SOURCE "RASCHE" AMD ZHEDEN ACCUMULATION – MACEDONIA
20. B. Cekova, B. Pavlovski, V. Markoska & A. Reka: EXAMINATIONS OF THE ADSORPTION FEATURE OF THE ZEOLITES TYPE 4A, SINTESIZED FROM NATURAL MATERIAL "PEMZA" - MACEDONIA
21. Albana Munga, Eriona Abazaj & Enkelda Ozuni: CHANGES IN TESTOSTERONE PROFILE SECRETION IN *Cavia porcellus* DURING CHRONIC EXPOSURE TO LEAD
22. Çiljeta Piro & Klementina Puto: MICROBIAL POLLUTION IN DRINO RIVER (GJIROKASTRA'S DISTRICT) AND ITS IMPACT ON FRESH VEGETABLES
23. Klementina Puto, Lorena Gjata, Naxhije Hila & Romina Libohova: MICROBIOLOGICAL POLLUTION IN NARTA LAGOON AND ITS IMPACT ON FISH
24. N.K.Revkov, N.A.Boltacheva & L.V.Bondarenko: LONG-TERM OBSERVATIONS OF ZOOBENTHOS IN DEEP-WATER SEWAGE DISCHARGE AREA IN YALTA GULF (SOUTHERN COAST OF CRIMEA, THE BLACK SEA)
25. Veselinka V. Grudić, Nada Z. Blagojević, Vesna L. Vukašinović-Pešić & Snežana Brašanac: KINETICS OF ASCORBIC ACID DEGRADATION IN GREEN PEPPERS

16^{00} – 20^{00} : Poster presentations (26 – 33)

26. Maksut Hadžibrahimović: THE IMPACT OF TOURISM ON THE ENVIRONMENTAL TRANSFORMATION
27. Sonja Georgievska: WATER QUALITY IN RIVERS WITH DIRECT INFLOW INTO THE RESERVOIR STREZEVO
26. Shupova Tetiana: AVIFAUNA OF SETTLEMENT ZONE OF KRIVOI ROG CITY IN UKRAINE
27. Rudina Uruci: CLIMATE CHANGES IMPACT ON ALBANIA WATER RESERVES
28. Vlatko Kastratović, Slađana Krivokapić, Dijana Đurović, Nada Blagojević & Miljan Bigović: RISK ASSESSMENT CODE (RAC) METALS IN SEDIMENTS FROM THE MOUTH OF RIVER MORAČA
29. A. Ahmeti, G. Xhixha, G. P. Bezzon, M. Bitri, C. Broggini, G. P. Buso, A. Caciolli, I. Callegari, F. Cfarku, T. Colonna, G. Fiorentini, E. Guastaldi, F. Mantovani, G. Massa, R. Menegazzo, L. Mou, D. Prifti, C. Rossi Alvarez, Dh. Sadiraj Kuqi, M. Shyti, L. Tushe, M. Xhixha Kaçeli, A. Zyfi: NATURAL RADIOACTIVITY IN CLAY BRICKS AND CEMENTS USED IN ALBANIA
30. Eralda Dano: MONITORING OF ORGANIC POLLUTANTS IN UPPER PART OF RIVER DRIN
31. A.A. Sysoev, I.V. Sysoeva & V.A. Bezymanny: THE EFFECT OF ORGANOCHLORINE PESTICIDES (OCPs) ON REPTODUCTION ACTIVITY AND PHYSIOLOGICAL STATE OF MICROALGAE IN CULTURES.
32. Blerina Xhaferaj, Jonida Canaj & Sokol Kociaj: THE PRESENCE ORGANOCHLORINE PESTICIDE RESIDUES IN VEGETABLES OF TIRANA, ALBANIA
33. Zamira Shabani, Lindita Dibra & Arlinda Ramaj: STATISTICAL STUDY ABOUT ASTHMA BRONCHIALIS IN REGIONAL HOSPITAL OF SHKODRA DURING 2008-2012

Advances in Biospeleological studies of Balkan peninsula

15^{30}-16^{10} : Oral presentations

(Chairman: Lada Lukić Bilela and Slavko Polak)

15^{30}-15^{40} : Lada Lukić Bilela, Roman Ozimec, Kazimir Miculinić & Damir Basara: A COMPREHENSIVE VALORIZATION OF MEGARA CAVE WITH A VIEW TO PRESERVATION AND PROTECTION
15^{40}-15^{50} : Roman Ozimec: RED BOOK OF CROATIAN CAVE FAUNA, A MODEL FOR A WHOLE DINARID REGION
15^{50}-16^{00} : Slavko Polak: CONTRIBUTION OF EGON PRETNER (1896-1982) TO THE KNOWLEDGE OF THE SUBTERRANEAN BEETLES (COLEOPTERA) FAUNA OF MONTENEGRO
16^{00}-16^{10}: Vladimir Pešić & Reinhard Gerecke: WATER MITES FROM PERCOLATING WATER OF CAVES FROM VIETNAM

Saturday, October 5

Ecology of Populations and communities

Plenary lectures:
09^{30}-10^{10} : Ljiljana Tomović, Rastko Ajtić, Bogoljub Sterijovski & Xavier Bonnet: POPULATION STUDIES OF REPTILES AT THE CENTRAL PART OF THE BALKAN PENINSULA
(Chairman: Vesna Mačić)

10^{30}-12^{00} : Oral presentations
(Chairman: Efigjeni Kongjika and Anton Lyakh)
10^{30}-10^{40} : Bekim Gashi, Fatbardha Babani, Fadil Millaku, Mirsade Osmani & Efigjeni Kongjika: ECOPHYSIOLOGICAL DIFFERENCES BETWEEN POIKILOHYDRIC PLANTS *Ramonda serbica* AND *Ramonda nathaliae*
10^{40}-10^{50} : Anton Lyakh: TOTAL AREA OF PORES LOCATED ON THE VALVES OF CENTRIC DIATOMS FROM GENUS *Coscinoduscus*
10^{50}-11^{00} : Vesna Mačić: SOME CHARACTERISTICS OF *Cystoseira* ASSEMBLAGES OF INTERTIDAL FRINGE ON THE COST OF MONTENEGRO
11^{00}-11^{10} : N. G. Sergeyeva, E. A. Kolesnikova, Kh. O. Kharkevych & T. N. Revkova: THE MODERN STRUCTURE OF MEIOBENTHOS UNDER PERMANENT ANTHROPOGENIC IMPACT IN THE SEVASTOPOL BAY (CRIMEA, BLACK SEA)
11^{10}-11^{20} : Mihallaq Qirjo, Enkelejda Velo & Valbona Aliko: BIOECOLOGICAL STUDY ON THE OUTBURST OF DIPLOPODES POPULATIONS (CLASS DIPLOPODA) AROUND THE WATER PUMPING STATION OF KONJAT, LUSHNJE
11^{20}-11^{30} : Roman Ozimec, Lana Baričević, Neven Matočec, Ivana Kušan, Armin Mešić & Zdenko Tkalčec: FIMICOLOUS ORGANISMS, INDICATORS OF BIODIVERSITY & GRASSLAND HABITATS: EXAMPLE FROM NATURE PARK BIOKOVO MT.
11^{30}-11^{40} : Aurora Bakaj (Çizmja) & Mirela Lika (Çekani): A PROSPECTIVE STUDY OF URINARY TRACT INFECTIONS IN SOME GROUP OF POPULATION IN TIRANA, ALBANIA
11^{40}-11^{50} : Tatjana Babović-Jakšić, Nebojsa Živić, Slaviša Stamenković, Aleksandar Djikić & Ljiljana Sretić: THE HEAVY METAL INFLUENCE ON THE HUMAN POPULATION IN KOSOVSKA MITROVICA
11^{50}-12^{00}: Goran Barović: CARTOGRAPHY IN ECOLOGY - ECOLOGY IN CARTOGRAPHY

$12^{00} – 14^{00}$: poster presentations

1. Larisa Bogdea, Constantin Cojan & Carmen Gache: BREEDING BEHAVIOUR OF SOME CICONIIFORMES SPECIES IN THE LOWER PRUT RIVER BASIN (REPUBLIC OF MOLDOVA)
2. Boltachova N.O. & Kolesnikova O.A.: CHANGES IN THE STRUCTURE OF MACROZOOBENTHOS COMMUNITY UNDER THE INFLUENCE OF INVASIVE SPECIES (BLACK SEA, SEVASTOPOL BAY)
3. Pavlović Nevenka, Tepić Marija, Dmitrović Dejan & Šukalo Goran: ZOOBENTHOS OF THE VRBAS RIVER RIGHT BANK BELOW TIJESNO IN THE ZONE OF WATER LEVEL OSCILLATIONS
4. Kramarenko S.S. & Dovgal I.V.: SPATIAL VARIABILITY IN TIME IN HYBRID ZONE OF TWO LAND SNAIL SPECIES
5. Lučić Davor, Miloslavić Marijana, Onofri Ivona, Gangai Barbara, Branka Pestorić & Dragana Drakulović: DOES A RECENT CHANGE IN THE NORTHERN ADRIATIC HYDROMEDUSAN FAUNA INDICATE THE POSSIBILITY OF SPECIES REPOPULATING?
6. Miloslavić Marijana, Lučić Davor, Onofri Ivona, Gangai Barbara & Branka Pestorić: MESOZOOPLANKTON DYNAMICS IN A STRATIFIED SEMI-ENCLOSED MARINE ENVIRONMENT (VELIKO JEZERO, SOUTH ADRIATIC SEA)
7. Nenad Labus, Nebojša Živić, Tatjana Babović-Jakšić & Jelena Krstičić: MORPHOLOGICAL CHARACTERISTICS OF A POPULATION OF THE FIRE SALAMANDER (*Salamandra salamandra*, Salamandridae) FROM ŠAR PLANINA MOUNTAIN
8. O. Grygorieva, M. Berezovskaja & O. Dacenko: RESPONSE OF CELL CULTURE OF *Chlamydomonas actinochloris* ON RE-EXPOSURE TO MICROWAVES
9. Kh. O. Kharkevych: NEW DATA ON SPECIES DIVERSITY OF TARDIGRADES OF THE BLACK SEA
10. Naxhije Hila, Mamica Kapaj & Klementina Puto: SURVEILLANCE OF GASTOENTERITIS OUTBREAKS IN THE POPULATION OF DURRES DISTRICT
11. Inna Drapun: SPECIES DIVERSITY OF THE PELAGIC OSTRACODS FROM THE ARABIAN SEA REGION
12. Jelena Lujić, Zoran Marinović, Desanka Kostić, Šandor Šipoš & Branko Miljanović: GROWTH PARAMETERS IN THREE CYPRINID FISH SPECIES, *Carassius gibelio* (Bloch, 1782), *Blicca bjoerkna* (L. 1758) AND *Abramis brama* (L. 1758) FROM THE TAMIŠ RIVER (VOJVODINA, SERBIA)
13. Jelena Lujić, Zoran Marinović, Desanka Kostić, Olivera Bjelić-Čabrilo, Branko Miljanović, Goran Marković & Violeta Bolić-Trivunović: PLOIDY ASSESSMENT AND SPECIFIC GROWTH PATTERNS IN THE PRUSSIAN CARP, *Carassius gibelio* (Bloch, 1782) FROM THE BEGEČKA JAMA RESERVOIR (VOJVODINA, SERBIA)
14. Makarov M. & Kovalyova M.: THE VERTICAL DISTRIBUTION OF ABUNDANCE AND BIOMASS OF MOLLUSCA ON ROCKS IN THE AQUATORIUM OF THE KARADAG (CRIMEA, UKRAINE, THE BLACK SEA)
15. N.G. Tarasova, T.N. Burkova, S.V. Bykova, O.V. Mukhortova & E.N. Unkovskaya: PLANKTON COMMUNITY (PHYTOPLANKTON, PROTOZOO- AND ZOOPLANKTON) ARE FORMED IN THE PHYTAL ZONE OF RAIFSKIY LAKES (VOLZHSKO-KAMSKIY STATE NATURAL BIOSPHERIC RESERVE, REPUBLIC OF TATARSTAN, RUSSIAN FEDERATION)
16. Tokarev Yu. N., Melnikov V.V., Vasilenko V.I., Juk V.F. & Dovgal P.I.: THE INFLUENCE OF THE BOTTOM TOPOGRAPHY AND WATER TEMPERATURE ON THE INTENSITY OF BIOLUMINESCENCE IN THE SEVASTOPOL COASTAL AREA

(UKRAINE)
17. Agnieszka Rewicz & Jeremi Kołodziejek: SEED HETEROMORPHISM OF *Epipactis helleborine* (L.) Crantz (ORCHIDACEAE, NEOTTIEAE)
18. Rozarta (Turku) Nezaj & Klementina Puto: ASSESMENT OF MICROBIOLOGICAL CONTAMINATION LEVEL OF DRINKING WATER FOR LEZHA REGION
19. Yu. S. Ryabceva: SOME TRAITS OF REPRODUCTIVE BIOLOGY IN *Viviparus viviparus* AND *V. sphaeridius* (Gastropoda, Viviparidae) FROM UKRAINE
20. Chovan A. & Serebryakov V.: MUTE SWAN *CYGNUS OLOR* SPRING-SUMMER GATHERINGS IN UKRAINE
21. Serikova I.M., Bryantseva Y.V., Tokarev Yu. N., Stanichnyi S.V. & Vasilenko V.I.: INTERANNUAL AND SEASONAL DYNAMICS OF THE BIOLUMINESCENCE FIELD AND PHYTOPLANKTON CHARACTERISTICS IN THE SEVASTOPOL COASTAL ZONE IN CONNECTION WITH THE HYDROLOGICAL FIELDS VARIABILITY
22. T. P. Hetman: DISTRIBUTION, ABUNDANCE AND DIVERSITY OF WRASSES (LABRIDAE, PISCES) OF THE CRIMEA, BLACK SEA
23. Orhideja Tasevska, Dafina Guseska & Goce Kostoski: STRUCTURE OF THE SUMMER ROTIFER ASSEMBLAGE IN THREE MACEDONIAN RESERVOIRS (KONCE 1, KONCE 3 AND SPILJE)
24. Pajović Igor, Petrić Dušan, Pajović Ljiljana & Dragićević Snežana: SEASONAL VARIATION IN *Stegomyia albopicta* OVIPOSITION DURING 2012 ON COASTAL PART OF MONTENEGRO
25. Ana Pavićević: INVERTEBRATE ASSEMBLAGE FROM INUNDATED SAMPLES ALONG A PERENNIAL DISTANCE GRADIENT IN AN INTERMINTTENT STREAM FROM MEDITERRANEAN PART OF MONTENEGRO
26. Mihail Dragoș Ștefănescu, Mariana Luminita Olaru & Felicia Anda Babalean: HABITAT NICHE OVERLAP OF RAPTORS ASSEMBLAGE IN THE SOUTH OF OLTENIA REGION (COMMUNITY LEVEL ANALYSIS)
27. Ljiljana Radojević, Branka Stevanović & V. Stevanović: APPLICATION OF DIFFERENT METHODS IN MICROPROPAGATION OF –SEVERAL SPECIES OF THE GENUS *AESCULUS*
28. Emilija Nenezić: THYROID HORMONES AND ALCOHOLISM
29. Slađana Gvozdenović, Vladimir Pešić & Ljiljana Tomović: PRELIMINARY POPULATION STUDY ON DICE SNAKE – *Natrix tessellata* (Laurenti, 1768) FROM SKADAR LAKE
30. Milica Divanović & Danilo Mrdak: COMPARISON OF FISHERY EFFORTS (CPUE) DURING FISHING WITH LINES AND GILL NETS IN OPEN LITTORAL WATERS OF MONTENEGRIN PART OF ADRIATIC SEA
31. Danilo Mrdak: ENVIRONMENTALLY ACCEPTABLE FLOW – A NEW MODEL FOR MONTENEGRIN RIVERS
32. Drago Marić & Jelena Rakočević: SOME LIFE HISTORY TRAITS OF *Salmo farioides* FROM MORAČA RIVER (MONTENEGRO)

Agroecology

Plenary lectures

15^{30}-16^{10} : Roman Ozimec & Davorin Marković: THE GREEN BOOK: A CONCEPT OF ENDANGERMENT ESTIMATION, RESEARCH AND CONSERVATION DIRECTIONS FOR SE EUROPE AGROBIODIVERSITY

(Chairman: Vladimir Pešić)

16^{30}-16^{50} : Oral presentations

(Chairman: Snezana Stavreva Veselinovska and Roman Ozimec)

16^{30}-16^{40}: Daniel Klee, Aleksandar Djikic & Jelena Djokic: BRIDGING PROTEIN GAP IN CHANGING CLIMATIC CONDITION IN NORTHERN KOSOVO REGION

16^{40}-16^{50} : Snezana Stavreva Veselinovska & Marjan Veselinovski: HEAVY METAL CONCENTRATIONS IN VEGETABLES WITH GROWTH STAGE AND PLANT SPECIES VARIATIONS

17^{00} – 19^{00} : poster presentations

1. Sali Aliu, Imer Rusinovci, Shukri Fetahu & Bekim Gashi: THE PHYSIOLOGICAL VARIATION FOR LEAF AREA IN SOME LOCAL MAIZE (*Zea mays* L.) POPULATION IN AGROECOLOGICAL CONDITIONS IN KOSOVA
2. Dragan Jovanov & Aleksandar Dejanovski: THE IMPACT OF THE HUMAN FACTOR ON THE EFFECTIVE ENVIRONMENTAL MANAGEMENT
3. F. Gjyriqi, I. Malollari, L. Xhagolli, P. Kotori, A. Bekteshi, Dh. Koraj, H. Manaj & A. Dhroso: BIOMASS TO ENERGY AND ENVIRONMENT FOR SUSTAINABLE DEVELOPMENT OF ALBANIA
4. Iu. Kondratiuk, P. Mamenko & S. Kots: QUANTITATIVE CHANGES IN PROTEIN CONTENT OF SYMBIOTIC SYSTEMS OF SOYBEAN UNDER INOCULATION BY RHIZOBIA WITH DIFFERENT EFFECTIVENESS
5. Nataliya Melnykova, Lyudmyla Mykhalkiv, Pavlo Mamenko & Sergii Kots: RHIZOSPHERIC BACTERIA OF CULTIVATED LEGUMES AND THEIR PLANT GROWTH PROMOTING ACTIVITY
6. Konotop Ye.O., Patsko O.V., Vorobey N.A., Kots S.Ya. & Taran N.Yu.: EFFICIENCY OF MICROBIOLOGICAL PREPARATIONS BASED ON CYANO-RHIZOBIAL ASSOCIATIONS AND NODULE BACTERIA FOR SOYBEAN PRODUCTIVITY
7. Blaga Radovanović, Vladimir Radovanović & Snežana Đekić: POTENTIAL USES OF GRAPE LEAVES FOR OBTAINING NATURAL ANTIOXIDANTS
8. Imer Rusinovci, Bajram Avdiu, Sali Aliu & Shukri Fetahu: THE FLORISTIC COMPOSITION OF THE NATURAL PASTURES MOUNTAINOUS MASSIVE OF NOVO BRDA
9. Sanel Riđanović, Lejla Riđanović & Dženita Pehilj: NEW APPROACH TO TREATMENT OF CARNIOLAN HONEY BEE (*Apis mellifera carnica*) AGAINST PARASITE *Varroa destructor*
10. Redi Buzo & Ilirjan Malollari: ENVIRONMENTAL IMPACTS IN CHARACTERIZATION OF POLYPHENOLICS CHANGES DURING RED WINE MICROOXYGENATION

Plenary Lectures

FORGET PLEISTOCENE! TETHYS-PARATETHYS REGRESSIONS AND ALPIDE OROGENY PRODUCED *Gammarus* DIVERSITY IN EUROPEAN FRESHWATERS

Tomasz Mamos[1], Michal Grabowski[1], Remi Wattier[2], Karolina Bacela-Spychalska[1] & Tomasz Rewicz[1]

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According to the classical point of view, the genus *Gammarus* had originated in inland waters and subsequently some of its representatives colonized marine habitats. Very recent studies point out reverse scenario with the Tethys Ocean and Paleocene as a spatiotemporal frame for the origin of the genus, followed by divergence of main *Gammarus* species groups later in Tertiary. Diversity, and phylogeny, within these lineages has been scarcely studied so far. Yet, already it is known that that the conventionally recognized morphospecies hide substantial cryptic diversity. That is especially true in Southern European glacial refugia. High genetic diversity of many animal species in these areas is commonly attributed to effect of Pleistocene glaciations. Our study aimed to reveal cryptic diversity and phylogeography of two morphospecies (*G. balcanicus* and *G. roeselii*) widely distributed in Europe. We used one nuclear (28S rRNA) and two mitochondrial (COI, 16S rRNA) markers sequenced for ca. 1300 individuals from 130 sampling sites in South-Eastern Europe, ranging from Alps to Crimean Peninsula and from northern Carpathians to southern Balkan Peninsula. In result, both morphospecies appeared to be complexes of dozens of highly divergent lineages, some dating back to the lower Neogene. Taking into account spatial distribution of these lineages and paleogeography of the area, the view that main *Gammarus* lineages diverged in freshwaters seems much simplified. Within *G. balcanicus*, several independent colonizations of inland waters in various areas of its present range can be assumed and related to emergence of once isolated land masses from the regressing Paratethys. Shallower phylogenetic divisions can be attributed to the Alpide orogeny, repetitively reshaping hydrography of the area. On the other side, *G. roeselii* seems to have more southern, Tethyan, origin and its diversification seems to be associated particularly with uplift and further history of Hellenides and Dinarides. Interestingly, Pleistocene glaciations do not seem to have an important impact on the large scale phylogeography of both morphospecies.

THE GREEN BOOK: A CONCEPT OF ENDANGERMENT ESTIMATION, RESEARCH AND CONSERVATION DIRECTIONS FOR SE EUROPE AGROBIODIVERSITY

Roman Ozimec[1] & Davorin Marković[1,2]

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Indigenous plant cultivars and animal breeds are important part of natural and cultural heritage, with associated many rare and endemic species. Recognizing their importance, associated habitats, landscapes and traditional agricultural practices, is obligate duty, especially in SE Europe region, recognised as one of Europe biodiversity centre. Team

experts connected with the Croatian State Institute for Nature Protection made a Green book concept, methodologically based on a concept of IUCN Red books, with basic estimation of endangerment, but also contribution on modern research and conservation directions. Traditional domestic breeds were selected as first agrobiodiversity group in Croatia for which Green book was made. In total 12 species with 62 traditional breeds are recognised with described: Croatian/English name; synonymy; threat category (FAO/EU/IUCN/NKU); origin; cultural heritage value; ecology; description; population trend and distribution; current value; endangerment causes; current regulatory protection; conservation measures. According to IUCN, 12 breeds are probably extinct (?EX), 9 globally and 3 regionally, 3 critically endangered (CR), 13 endangered (EN), 12 vulnerable (VU) and 5 not threatened. For 16 status is not established due to data deficient (DD), indicated necessarity of further researches, supported by only 26 officially recognised breeds. As next project, Green book of grape vine is planned.

POPULATION STUDIES OF REPTILES AT THE CENTRAL PART OF THE BALKAN PENINSULA

Ljiljana Tomović[1], Rastko Ajtić[2], Bogoljub Sterijovski[3] & Xavier Bonnet[4]
[1]Institute of Zoology, Faculty of Biology, University of Belgrade, Serbia; [2]Institute for Nature Conservation of Serbia, Serbia; [3]Macedonian Ecological Society, Macedonia; [4]CEBC-CNRS, France

Population studies on Reptiles in the central part of the Balkan Peninsula (Serbia, Macedonia, Montenegro and Bosnia & Herzegovina) were set up in year 2008. We performed Capture-Mark-Recapture studies on several Reptile species – *Testudo hermanni*, *Natrix natrix*, *Natrix tessellata*, *Vipera ammodytes* and *Vipera ursinii*.

Hermann's tortoise is a species under strong anthropogenic influences (illegal trade, pet trade, direct killing, road-kills, and fires) and its populations are declining in the western part of the distribution range. In the Balkans, relatively dense populations still exist, but detailed population studies are still lacking. We set up CMR studies in eight populations in three countries and marked more than 3200 individuals. In order to obtain data from variable habitats and regions, we included island and mainland populations, as well as those from continental and Mediterranean parts of the central Balkans. Results are showing that although this species is quite abundant in the region and that its populations are relatively dense, specific human activities such as road-kills, human-induced fires and illegal trade may have strong negative influence on this species in the central Balkans in the future.

Growing evidence suggest that snake populations are collapsing worldwide. Most conservation efforts are devoted to the urgent protection of few flagship species (e.g. bird & mammals), despite repeated claims that common species should not be neglected under the obvious principle – it is more efficient to prevent disasters rather than to cure their effects. This is especially true regarding unpopular organisms such as snakes.

Natricine snakes (*Natrix natrix* and *Natrix tessellata*) are still widely distributed and quite abundant in Europe. However, there are limited data about population trends and conservation threats, especially in the southern part of the continent. These snakes exhibit an extraordinary phenotypic plasticity in response to ambient conditions in terms of growth rate, fecundity, diet, activity, anti-predator behaviours, etc. Thus, they are ideal model-system for assessment of the habitat quality – better quality habitats should shelter larger individuals and/or larger populations. Our studies included populations of both species from four counties and three different habitat types – rivers, large lakes and marshes; in total, more than

8000 snakes were marked. CMR studies revealed that there is a huge variation in population density, age and sex structure, body size, age at maturity, fecundity and body condition index among populations from the central part of the Balkans. Also, we detected various conservation threats in different habitats – illegal poaching, direct killing and water pollution. We proposed conservation measures for prevention of the population declines in the future.

Vipers (as well as other poisonous snakes) have always been subject of human fears and superstitious. They are regularly killed in millions; consequently, their populations are declining in many places in the world. Similar (or even worse) situation is in the Balkans – in some countries none of the Vipers are protected by law, even in the case of highly endangered and internationally protected species, such as *Vipera ursinii*, or species under strong anthropogenic impact (for anti-venom production), such as *Vipera ammodytes*. Aims of our populations studies (more than 700 individuals marked), conducted in both lowland and mountain habitats were to examine morphological and genetic diversity, microhabitat and food preferences as well as basic population parameters (sex ratio, age structure, fecundity). We hope that results of our studies will help to all the countries in the region to cooperate and harmonize legislative concerned to formal protection of the Vipers.

Besides CMR studies, we run several behavioural tests, physiological research, morphological analyses, translocation and radio-telemetric studies, etc. We expect that the results of the comparative population studies from the central Balkans will be the basis for the estimation of the population status, threats and conservation measures for endangered Reptile species in the region.

Protection of the Environment and Urban Ecology

ACCUMULATION OF MERCURY AND LEAD AT SIX KINDS OF FISH IN DURRËS BAY

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This study assessed the concentrations of mercury (Hg) and lead (Pb) in sea water and muscle and liver of *Mugil cephalus*, *Sparus aurata, Merlucius merlucius, Scorpanea porcus, Mullus barbatus* and *Decentracus labrax.* These samples were collected in five stations in Durres bay. Fish were collected by size (small and large). The samples of water were analyzed using Absorber Spectometry Atomic "SOP ASA-01^{A}" and fish samples were analyzed using AAS -10 varian. The mean value of lead (Pb) in muscle was 0.18±0.12 mg/kg wet weigh for small fish and 0.437±0.3 mg/kg wet weigh for large fish. The mean value of mercury (Hg) varied from 0.10±0.056 for small fish and 0.307±0.1 mg /kg wet weigh for large fish. Metal levels in muscle were lower than recommended limiting standart. The results revealed that the concentrations of all the metals in the tissues (muscle and liver) were higher than the concentrations of the metals in water.

THE EFFECTS OF DIFFERENT TILLAGE, CROP ROTATION AND STUBBLE MANAGEMENT ON RAINFALL INFILTRATION, SOIL PROPERTIES, AND SOIL AND NUTRIENT LOSSES

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Data about soils in Albania show that, due to poor management in the past, a number of degradation processes are active. Soil erosion is particularly severe. A study to obtain information concerning the effects of different tillage, cropping systems and stubble management on soil and nutrient losses was undertaken between 2005 and 2010 in the Korça region, south eastern Albania. The objectives of this study were: (**i**) to quantify water erosion from agricultural land in the mountainous terrain and to find efficient farming practices to reduce runoff, soil and nutrient losses; (**ii**) to evaluate the effect of some conservation farming practices to minimize the off-site environment impacts on the quality of water leaving the agricultural watersheds. Moldboard plowing was compared with two conservation tillage methods: disking and no till. The two methods were evaluated on two crop rotations: pasture-wheat and wheat-barley-grain legume, and two stubble management treatments: stubble retained and stubble removed. The conservation tillage systems reduced soil and nutrient losses when compared to the systems using moldboard. Conservation tillage was particularly good at reducing runoff, soil and nutrient losses when used in a cereal-pasture rotation. Crop stubble retention on the soil surface favored infiltration in comparison with stubble harvesting. The results of this work showed that sound rotation, conservation tillage and retention of crop residue are important components of conservation land management and sustainable crop production systems.

A COMPARATIVE ANALYSIS ON TWO DIFFERENT FULLY AUTOMATED ANTI-CYTOMEGALOVIRUS IGM IMMUNOASSAYS

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Cytomegalovirus is a virus whose infections are frequently associated with the salivary glands in humans. The virus is spread via fluids of the body especially to the new born baby from an infected mother. Medical diagnostic is working to determine the most sensitive techniques for the detection of *Cytomegalovirus* antibodies, in the framework of which is developed this scientific work. An enzyme-linked immunosorbent assay (ELISA, applied in CHORUS instrument) and an enzyme-linked fluorescent assay (ELFA, applied in Mini-Vidas instrument) have been compared with each other for the detection of Cytomegalovirus IgM antibodies. There have been analyzed 50 patients with each technique. ELISA technique showed a specificity of 83% and a sensitivity of 87% and ELFA technique showed a specificity of 95% and a sensitivity of 97%. ELFA technique showed a better ability to detect Cytomegalovirus IgM antibodies during the early stage of acute infection. Analysis of the results confirmed the usefulness of ELFA technique to diagnose acute Cytomegalovirus, especially during the first trimester of pregnancy.

PROBLEMS RELATED TO IMPLEMENTATION OF ALBANIAN LEGISLATION ON WASTE MANAGEMENT

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The increase of population, demographic movement towards urban areas and also the inadequate social infrastructure has contributed in the increase of waste, particularly inert. Waste legislation aims to minimize the impact of waste into the environment and to improve the efficiency of the usage of resources in Albania. The main objective of this study is to prevent environmental degradation, and promoting environmental sustainability.

National Policy of Waste Management is based on four steps: Planning, Education, Resources and Legislation. This policy intends to improve waste management, reducing environmental risks and improving human health according to EC requirements.

The biggest problem regarding to waste management in Albania does not consist in the lack of law, but in the lack of institutional management planning, and technical capacities and human as well.

It is also noticed the lack of experience/tradition, economic recourses, and networks to collect and treat the waste.

Waste management in Albania has been identified as a significant environmental issue in a number of strategic documents of Environmental Research, with the aim of:

- Constructing of infrastructure for urban waste treatment, selective collection, recycling and disposing of them.
- Taking action to eliminate the uncontrolled disposal and incineration of municipal waste that continues to pose a threat to health and environment.
- Developing a clear strategy for waste disposal.

THE INFLUENCE OF ENVIRONMENTAL TEMPERATURE ON THE BLOOD PARAMETERS OF STRAY DOGS

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The goal of the study was to evaluate the impact of seasonal oscillations in hematological parameters and biochemical blood of stray dogs in Tirana district. Blood was collected in the cephalic vein of 62 clinically healthy dogs, 1 to 10 years old.

Results suggest that exposure of stray dogs to extreme temperatures of environmental conditions adversely affects physiological functions as reflected by the hematological and biochemical parameters. Hematological values including RBC count, PCV and Hgb concentration were decrease ($P < 0.05$) during the summer season. The level of plasma total protein, glucose and cholesterol was significant increase during summer compared with winter, whereas the BUN was increased during the winter season. No significant differences were found on the creatinine value and the activity of some plasma enzymes (ALT and AST) in the different seasons, but mean values of these enzymes were higher compared with the reference ones in dogs.

Taking the results suggests that seasonal variations have to be taken into consideration for a correct interpretation of the hematology and blood chemistry of stray dogs.

IMPACT OF URANIUM MINING ACTIVITIES ON SOIL BACTERIAL AND LUMBRICIDAE COMMUNITIES INHABITING THE MINING AREA

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Uranium (U) mining activities release into the environment U and heavy metals (HMs) having serious negative effects on wild life and human health. Bulgaria was one of the biggest producers of U in Europe till 1992 when the U production and milling was ceased by Bulgarian government decree. It was investigated the adverse effects of U and HMs pollution on the abundance, activity and diversity of soil bacterial and earthworm communities. The territory of interest was Senocos uranium mine, located in Pirin Mountain - Bulgaria. The soil samples and earthworms were collected in spring and autumn from 2009 to 2012. Soil bacterial activity was evaluated by dehydrogenase activity (Dha) test and community level physiological profile (CLPP). Earthworms' communities were analyzed by their abundance and species diversity. Bacterial activity and physiological diversity were low in plots both high polluted and low nutrient abundant. The lumbricidae abundance and diversity was also affected by pollution. The diversity of lumbricidae was low and unevenly distributed across the plots surveyed. The multiregression analysis manifested both the control power of pollution and environment on soil organisms. We concluded that the adverse effects on soil communities are complex including both the level of U and HMs pollution and the values of local environmental factors.

CONTENTS OF HEAVY METALS (Zn, Mn, Cu) IN DIFFERENT PARTS OF *TRAPA NATANS* L. FROM SKADAR LAKE, MONTENEGRO

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Lake Skadar is the largest lake at Balkan Peninsula. It is an aquatic area of extraordinary natural, turistic, cultural and scientific importance.

Metals are important environmental pollutants, but may also be natural component of the water. Aquatic plants serve as natural mehanical and biological filters as they clean the lake water of different polluted substances with organic or inorganic caracter, including heavy metals.

The aims of the study were to assess the migration of heavy metals between ecosystem components of Skadar lake by determning the accumulation of Zn, Mn, and Cu in the water, sediment (determination of content of bioaccesible form of metal in sediment) and different organs (root, stem,leaves) of natant perennial species *Trapa natans* L. The samples of plant material, water and sediment were taken from three different locations from Skadar lake during sammer period of the year 2012.

The results of research indicate different concentration of heavy metals at investigated plant species at almost all locations. The maximum concentration was found for manganese, and the minimum for copper. The bigger values of these three metals were found in the roots (Mn_{max}=358,8 $mgkg^{-1}$; Zn_{max}=40,03 $mgkg^{-1}$; Cu_{max} =3,8 $mgkg^{-1}$). The concentrtions of these metals were lowest in the leaves (Mn_{min} = 62,78 $mgkg^{-1}$; Zn_{min} =5,43 $mgkg^{-1}$; Cu_{min}=2,01 $mgkg^{-1}$), indicating the uptake route and transport of these metals in the macrophyte. These differences, the most probably are results of different caracter of plant in the filed of acceptance and distribution of some heavy metals in it tissue, and depend on the part of the plant. Also it is not excluded the possibility of geohemical influence of sediment nature and antropological origins of metals.

TOTAL PHENOLIC CONTENTS OF THE HONEY FROM MONTENEGRO

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Honey is rich in polyphenol compounds, which act as natural antioxidants, and were becoming increasingly popular because of their potential role to improve human healt. The honey consumed in most of Montenegro is harvested from tradicional hives and processed using tradicional methods. In this study 14 Montenegrian honey samples of different floral and geographical origin (Ulcinj, Budva, Tivat, Bar, Podgorica, Nikšić, Cetinje, Danilovgrad, Kolašin, Mojkovac, Šavnik, Pljevlja, Bijelo Polje and Plužine) were analyzed to determine their total phenolic content. The total phenolic content was tested by the Folin – Ciocalteu metod. The total phenolic content in honey samples varied from 32,2 mgGAE/g (from Kolasin) to 93 mgGAE/g (from Ulcinj). It seem that the difference arises because of the different floral composition in different locations of Montenegro.

ADSORPTION OF CADMIUM FROM WATER USING NEUTRALIZED RED MUD AND ACTIVATED NEUTRALIZED RED MUD

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Cadmium (Cd) is one of the heavy metals, which is highly toxic for living organism even if it is present in low levels. According to The World Health Organization's recommendation Cd(II) limit in drinking water is 0.005 mg/L. Among the cadmium removal technologies adsorption is very important. There is some papers which used red mud as adsorbent for cadmium. Red mud is the by-product of alumina production from bauxite.

The aim of this paper was to investigated the removal of cadmium from water with seawater-neutralized red mud (Bauxsol) and Bauxol which is acid treated (aBauxsol) and acid-heat treated (AB). The investigations were performed within the concentration range from 0.05 to 1 mmol/dm^3. The highest efficiency in the adsorption of cadmium is achieved by application of AB. For the initial concentration of cadmium 0.05 mmol/dm^3, it is removed 64 %, 86 % and 94 % of cadmium by Bauxsol, aBauxsol and AB, respectively. The maximum sorption capacities, calculated using the Langmuir isotherm, are 0.120 mmol/g, 0.154 mmol/g and 0.194 mmol/g for Bauxsol, aBauxsol and AB, respectively. It was shown that the quantity of removed cadmium decrease with increasing initial concentration of cadmium in solution for all sorbents. The time for the establishment of equilibrium depends on the initial concentration of metal. Only 60 minutes are enough to establish equilibrium in the most concentrated solution, while in the most diluted solutions it takes less than 15 minutes. The negative ΔG values indicate that sorption processes take place spontaneously at room temperature.

KINETICS OF ASCORBIC ACID DEGRADATION IN GREEN PEPPERS

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In this paper, the kinetics of degradation of pure Ascorbic acid (AA) and AA contained in the green peppers, at different temperatures for 20 days was investigated by cyclic voltammetry. It has been shown that the degradation of AA at all given temperatures follows first-order kinetics. The values of the rate constants of the investigated oxidation reactions increase with increasing temperature and the values are as follows: $5x10^{-5}$; $2x10^{-4}$; $1x10^{-3}$ and $3x10^{-3}$ min^{-1} at 25 ˚C, 35 ˚C, 65 ˚C and 90 ˚C, respectively. The temperature dependence of the rate constant follows Arrhenius equation, and the value of activation energy of the investigated acids degradation is 48.204 kJ / mol. Also, it was shown that the oxidation of AA in pepper juice is a reaction of the first order, while the lower value of the rate constant compared to pure AA ($5x10^{-3}$ min^{-1}) indicates the influence of other substances present in pepper on the stability of AA.

ANALYSIS OF THE ACTIVATED SLUDGE WASTEWATER TREATMENT PROCESS BY APPLICATION OF A PROCESS SIMULATOR

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The use of process simulation for simplification of process modeling and performance optimization of biological wastewater treatment processes is described in this paper. The software package SuperPro Designer was used for this purpose. Aerobic bio Oxidation wastewater treatment technique was considered as a representative example for continuous environmental process.

For certain dimensions of the total equipment, including the wastewater equalization tank, aerobic bio oxidation reactors, and secondary settling tanks, we simulated different quantity and constant quality of wastewater inflow, and obtained the optimum sludge residence time, optimal effluent quality, and maximum equipment utilization. Further, for constant quality and quantity of wastewater inflow, we simulated optimal equipment dimensions of the oxidation reactors and secondary settlers, and this resulted with new sludge residence time and new characteristics of the effluent water.

DETERMINATION OF HEAVY METALS THAT CONTRIBUTE TO WATER POLLUTION IN MID-FLOW OF VARDAR RIVER

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As an environmental medium, earth's water has an essential role in the creation and sustainability of life on Earth. The water is practically a source of Life. It is known that the hydrosphere was essential in the creation of biosphere. For millions of years, the water circulates through all aggregate states and provides for other life sustaining cycles. On the other hand, the water can be unpredictable and cause significant damage to all that has previously been created. This behavior can be caused by natural processes, but also can be result of uncontrolled human activities. Humans tend to consider themselves as the center of nature and fail to recognize that uncontrolled development can put in question the very existence of the civilization. Water pollutants are released from settlements (communal wastewater), industry (heavy metals, organic pollutants), mining (heavy metals, various minerals), oil industry, agriculture (nitrates, heavy metals) etc.

Increased water pollution with heavy metals corresponds to the emergence of the industrial revolution. It is the development of heavy metals industry that continually increases the emission of heavy metals, which remains as one of the biggest pollutants of receiving waters. In the frames of this work, the qualitative results of the heavy metals presence will be examined (Cu, Cd, Fe, Mn, Pb and Zn).

DISCUSSING DIVERSE ISSUES AND PROSPECT FOR SUSTAINABLE SOCIAL ECONOMIC DEVELOPMENT IN PRESPA NATIONAL PARK, ALBANIA

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This paper refers to protected regions of environmental and cultural value. For the protected area, linkages between social and ecological systems have become increasingly recognized in the past decade. Albanian part of Prespa Park (AL-Prespa), located in the southeastern corner of Albania, is a unique environment with significant natural and cultural elements that are being seriously threatened. The past symbiotic relationship between the natural environment and the local communities located within the park boundaries has changed with the advent of human activities. The local communities face many remote rural area problems, such as depopulation; inadequate services; sense of social isolation; impoverishment of biodiversity; a low level of professional skills; and difficulty marketing products. Park infrastructure is non-existent and there is a lack of cooperation between the many agencies and levels of government that have jurisdiction over the park. This case study attempts to examine stakeholder perspectives and human ecological interactions in order to better understand the sources of conflict and environmental problems in the area.

POSSIBILE DRUG AND FOOD INTERACTIONS IN PATIENTS TREATET IN SOME MEDICAL CENTERS OF TIRANA

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Drug–food interactions constitute, the potential mechanisms leading to often preventable events and health damage. The purpose of this study is evaluating the profile of potential drug-food interactions in patients treated in first aid centers and clinics of Tirana.

Selected medical files were investigated during the time patients were admited in medical centers. Potential drug-food interactions and medications taken with certain types of foods. were found.

Of all patients included in the study, experienced at least one interaction. Identified drug-food interaction, most were of moderate and minor severity. Most frequently involved in potential drug-food interaction were antidepresives (24.5%), Antihipertensives (22.4%), and anticoagulants (14.3%).

The presence of drug –food interactions is a permanent risk in the treatment of cronic diseases. The high frequency of interactions should be a concern for Albanian physicians, health care professionists and patients. Pharmacotherapy, monitoring of patients, further divulgation and awareness preventing harmful or clinically important drug-food interactions as well pharmacists and dietologists in the multidisciplinary team are some manners of contributing to treatment and consulting of cronic patients.

TOXIC EFFECTS OF LEAD-DOPED WATER OF DRINI AND BUNA RIVERS ON *Allium cepa* L.

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The *Allium cepa* L. test was applied in the present study to screen the phyto- and genotoxic effects of some surface water samples collected in Drini and Buna Rivers (North-West Albania), experimentally enriched with lead as $Pb(NO_3)_2$ salt. The roots of onion bulbs were exposed for 24, 48 and 96 h to three doses, representing respective ¼ EC_{50}, ½ EC_{50} and EC_{50} of $Pb(NO_3)_2$ loaded samples. Macro and microscopic endpoints of onion roots grown in unloaded and lead-loaded samples, as: morphological aberrations, mitotic and phase indexes, micronuclei formation and chromosomal aberration frequency and types were evaluated and compared. *A. cepa* assay exhibited different sensitivities according to water sample quality, corresponding lead concentrations and exposure times. The results revealed that excess of lead and treatment duration can cause strong toxic effects on root meristem. The most frequent chromosomal aberrations types resulted: stickiness, bridges and fragments, c-mitosis, laggard and vagrant chromosomes. Nuclear alterations as disintegrated nuclei and micronucleated cells were observed, showing high genotoxic effect induced by lead. Morpho- and cytogenetic analyses used in this investigation proved to be valuable and appropriate tools for early warning detection and bio-monitoring the heavy metal pollutants potentially present in natural water bodies.

CAPABILITY OF *Allium cepa* L. ROOTS IN EVALUATING ANTAGONISTIC EFFECTS OF Ca^{2+} IONS TO HAZARDOUS Al^{3+} IONS

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Environmental pollution by metals has become a serious problem in many developing countries as Albania, due to rapid industrial development. The present investigation focused on the capability of *Allium cepa* L. to clarify the antagonistic effects of calcium to hazardous Al^{3+} ions. The roots of onion bulbs were exposed to EC_{30}, EC_{50} and EC_{70} concentrations of $AlCl_3$ salt in tap water, firstly alone and than together with four $CaCl_2$ salt concentrations (0.5-500 mg/L). Experiments employing the evaluation of morphological aberrations in roots and mitotic and phase indexes, interphase nuclear volume and DNA content, micronuclei formation and chromosomal aberration frequency and types in root meristem, were done. Results showed remarkable root growth inhibition, reduction of mitotic activity and an increase of different chromosomal abnormalities, especially c-mitosis and stickiness, as the aluminum concentration increased, demonstrating high phyto- and genotoxic effects of aluminium in *A. cepa* roots. Otherwise the combination of Al^{3+} EC_{50} and EC_{70} with all Ca^{2+} concentrations caused an appreciable decrease of aluminum toxic activity. This study also discussed the possible mechanisms of Al-induced toxicity and Ca-protective role in plants in case of contamination by this *metal.*

DISTRIBUTION OF IRON DEFICIENCY ANEMIA (IDA) IN A HOSPITALIZED PEDIATRIC SAMPLE (RETROSPECTIVE EPIDEMIOLOGIC STUDY 2009 – 2012)

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Besides frequent pathologies of respiratory and gastro intestinal tract etc, we concluded that the irondeficency anemite are added constantly. These are more frequent and more obvious under age 4-5. The main reason are their malnutrition.

The aim of our nvestigation are: 1) The evaluate the morbidity in the pediatric service; 2). Rate the ferrodeficitare anemia, 3). The way of the patients feeding

In our retrospective study in the years 2010-2011 were analyzed and studied all admissions made in the Pediatrics service. The cases are studied and admissions with respiratory infections, gastrointestinal, urinary infections etc .All the hospitalised cases are studied for the presence and nivel of hypocrome anemia according the study criteria. The way of the patients feeding

From our work from 2896 hospitalized children results: with respiratory disease 891 cases or 31% of infections and digestive tract 695 cases or 23.5% and viroids 330 cases or about 11.5% of urinary tract infections and 110 cases or 3,8% cases etc. As with anemia ferrodeficitare are 1186 cases with 40.8% of all cases of all the hospitalised cases.

In our study it was found that the presence of irondeficency anemia is high and reaches up to 40.8% of hospitalized cases where patients about 42.5% are aged under 4 year(where normal value of hemoglobines is 11 gr). The high prevalence of hypocrome anemia is caused by the malnutricion.

BONE MINERAL DENSITY AND FACTORS ASSOCIATED WITH OSTEOPOROSIS IN PRE AND POSTMENOPAUSAL ALBANIAN WOMEN

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The aim of this study was to asses the bone mineral density (BMD) and identify factors associated with low BMD and osteoporosis in pre and postmenopausal albanian women. A total of 121 albanian women aged 23–76 years participated in the study. Subjects were divided into two groups: premenopausal and postmenopausal women. All subjects completed a questionnaire on life style factors. Height and weight were measured. Bone density was scanned using Quantitative Ultrasound (QUS). The data was analysed statistically using SPSS and the values of two groups were compared. BMD was significantly lower among postmenopausal women when compared to premenopausal women *(P=0.031)*. We found a negative correlation between age and BMD *(r= -0.338, P<0.01)*. BMI was significantly higher in postmenopausal women *(P = 0.027)* compared to premenopausal women. Results revelated that the prevalence of osteoporosis among postmenopausal women was 11.76%. The BMD was not significantly related to smoking and physical activity.

EFFECT OF STORAGE TIME ON OLIVE OIL QUALITY IN ALBANIA

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This work reports changes in the major quality parameters of Albanian olive oils stored at room and refrigerator temperatures in dark and light monitored for several months. Olive oil's characteristic aroma, taste, color and nutritive properties, stability distinguish it from other edible vegetable oils. Peroxide values, specific absorbance values, free fatty acidity, were determined. One of the primary causes of loss of olive oil quality is oxidation. Among the technological factors that influence the composition and oxidative stability of olive oils, the extraction method and storage conditions play a critical role in its quality. Oxidation takes place either in the presence of light (photooxidation) or in the dark (autoxidation) . Olive oil is considered to be resistant to oxidation in comparison with other vegetable oils because of its low content of polyunsaturated fatty acids and the presence of natural antioxidants. Abundance of oleic acid, ranging from 56 to 84% of total fatty acids, is the feature that sets olive oil apart from other vegetable oils. Olive oil provides a rich source of natural antioxidants.

PLASTIC WASTE MANAGEMENT IN ALBANIA AND ITS EUROPEAN PERSPECTIVE

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The increasing use of plastic materials in recent decades, along with the benefits and facilities that has brought in our daily lives, has also caused a number of problems mainly related to their impact on the environment as waste. So much more effective management of plastic waste is a challenge to society, but also to the chemical industry. In recent years the European Union has implemented strict laws for their management which focus mainly on three areas: reduction, recycling, reuse. Most plastic materials manufactured belong to the thermoplastic materials category, and based on their properties, these materials can be reused and recycled into useful products. In addition to recycling, the EU countries, plastic materials are also used in energy recovery. In Albania, recycling industry of plastic waste has been developing in recent years where the processing capacity estimated at 85'000ton per year, while no plants use energy from waste, as well as plants composting biodegradable waste and combustion of recyclable waste. Besides assessing the current situation in Albania plastic waste management and their comparison with EU countries, to study the recommendations are based on the technical and technological conditions.

THE UPTAKE OF LEAD BY AQUATIC MACROPHYTES FROM SKADAR LAKE

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Lead is potentially dangerous and toxic metal for most forms of life and is relatively accessible for plants from the sediment, water and aerosol sources. Many lake's plants have the ability to develop tolerance and mechanisms of resistance to toxic metals. Many studies have shown that root has the ability to take significant amounts of lead, whereas translocation to the upper plant parts is limited. As an indicator species of aquatic macrophytes were used: *Phragmites australis*, *Ceratophyllum demersum* and *Lemna minor* sampled from six localities of Skadar Lake in the 2011. year. Mean seasonal concentrations of Pb in the tissues of *C. demersum* and *L. minor* (whole plant), and the root of *P. australis*, do not differ significantly. Seasonal and spatial variations of concentration are clearly noticeable. The highest concentration of Pb was recorded in the leaf *C. demersum* in April (10.7 mg kg^{-1}) and the root of *P. australis* in October (10.1 mg kg-1). *P. australis* and *C. demersum* due to its ability to accumulate Pb, easy collection and identification, high biomass and availability throughout the year suitable for biomonitorig Pb in lake systems.

STUDY ON VULNERABILITY OF CLIMATE CHANGE IN ALBANIA POWERED BY THE INSTITUTE OF GEOSCIENCES, ENERGY, WATER AND ENVIRONMENT

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The study was of a big importance for the education process within the Department on Climate and Environment - IGEWE of the Polytechnic University of Tirana. Through this study, where the students have been involved during whole period (2008-2010) of research, they got theoretical knowledge and practical skills for analyzing the relations between the agriculture and climate in Albanian conditions.

The climate change scenario for Albania lead to decrease of precipitation amount about 12.5% up to the year 2100, as a consequence it can be expected that the cases with severe and extremely dry to have the increase tendency

The results indicated the presence of multiple risks that affects agriculture, which are associated to climate and non climate factors. These risks influence the exposure and the sensitivity of agriculture and consist of, drought, extreme weather events, land use, erosion, environmental conditions and soil conditions. Changes in climate pattern are experienced

together with wide range of non climatic risks that affects adaptive capacity, responses and the way in which agriculture is vulnerable to climate change. Current analysis shows that future vulnerability will be affected by economic situation, access to technology, institutions support, policies, in the nature and impact of climate change.

MONITORING OF THE QUANTITATIVE CHARACTERISTICS OF THE FEED WATERS OF THE SOURCE "RASCHE" AMD ZHEDEN ACCUMULATION – MACEDONIA

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The research presented in this paper will show the results of hydrological studies of surface and groundwater in the zone of the second protected area of the source "Rasche" for the period of 2009 - 2010. Additionally, the paper will present the results of the monitoring process, applied on the main characteristics of Polog valley and the source "Rasche" - the feeding mechanism of the source, climate factors that affect the regime of accumulation and of Zheden and Rasce, as well as the huge amount of water and frequent occurrence of floodings in the valley of Polog.

The paper includes a map of scheduled measuring points – allocated network of conducted activities where quantitative characteristics of surface waters from - Transverse Profile - Sarakjnici, - Transverse Profile - Silmak, - Transverse Profile – Deponija, - Transverse Profile – Rasche were monitored.

EXAMINATIONS OF THE ADSORPTION FEATURE OF THE ZEOLITES TYPE 4A, SINTESIZED FROM NATURAL MATERIAL "PEMZA" - MACEDONIA

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The Zeolite type 4A is synthesized from the natural material pemza,which carries the oxides SIO_2, Al_2O_3, Na_2O. The low temperature synthesis from 363 – 373 K is used.Absorption features are researched to the gained zeolite with the static gravimetric methode. The adsorbtional isotherm are graphicallu presented and the linear isotermic forms determines specific relations of the zeolite type 4A with the time of syntesis of 2h,4h,and 6h. The biggest specific surface has the zeolite type 4A which is synthesized for 6 h, where S = 214m^2 /g. The derived zeolite will be tested for adsorbtion of heavy metals in polluted soils and water, due to its adsorptional features.

CHANGES IN TESTOSTERONE PROFILE SECRETION IN *Cavia porcellus* DURING CHRONIC EXPOSURE TO LEAD

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Taking in consideration that lead occupies the second place in the CERLA priority list of hazardous substances, it is of special importance to evidence lead's adverse effects.

The main purpose of this study is to estimate the effect of BLL in testosterone secretion.

In order to ascertain what reproductive abnormalities occur in experimental animals when exposed to lead, approximately 4 months old animals (*Cavia porcellus*) were treated with intraperitoneal injections of different concentrations of lead acetate in aqueous solutions for 60 days.

According to the data collected, chronic exposure to lead affects greatly the profile of testosterone secretion. There is a strong negative correlation between BLLs and testosterone secretion in two of the doses applied. In very low doses of lead (tolerable daily intake) instead, the secretion of testosterone increases. Pearson's correlation coefficients are as follow; tolerable daily intake dose of lead- $r = 0.7794$, intermediate dose- $r = -0.8269$, and near lethal dose- $r = 0.8697$ (in all cases $\alpha = 0.05$).

POLYCHLORINATED BIPHENYLS (PCBS) LEVELS IN DRINI RIVER SURFACE WATER TRANSBOUNDARY SYSTEM

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The Drin River is the "connecting body" of a water system, linking the lakes, wetlands, rivers and other aquatic habitats into a single ecosystem of major importance. The water bodies and their watersheds are spread in a geographical area that includes Albania, Greece, the Former Yugoslav Republic of Macedonia, Montenegro and Kosovo. A number of PCB congeners were identified and quantified in water samples of Drini River. A total of 32 surface water samples at 8 sampling sites were collected in four seasons of 2011-2012. The PCBs were identified and quantified in the water by using L/L extraction combined with GC-μECD instrumental analyses. The total concentration of PCBs (∑PCBs) in the river water ranged 38.6 - 345 ng/L. An inclusive transboundary integrated monitoring of toxic organic micro-pollutants is needed in the future in this area.

MICROBIAL POLLUTION IN DRINO RIVER (GJIROKASTRA'S DISTRICT) AND ITS IMPACT ON FRESH VEGETABLES

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One of enviromental challenges facing Albania recently is the microbial quality of surface waters and fresh vegetables that can be irrigated with them. Drino River is one of the most important water resources in Gjirokastra's district with enviromental, social and economic values. The aim of our work during 2012 – 2013 periode was the monitoring of bacterial pollution of Drino's water and its impact on fresh vegetables. Microbiological examinations of water and lettuce samples, as well as the physical – chemical examinations of river's water collected from 6 stations were performed in four seasons: Summer - Autumn 2012, Winter - Spring 2013. The results obtained from the analysis of microbial indicators FC/FS vary for FC from 1500 to $4.6x10^6$ bacteria/100ml and for FS from 90 to$1.5x10^4$ bacteria/100ml for the Drino's water, while for the lettuce vary for FC from $4,3 \times 10^4$ to $2,1 \times 10^5$ bacteria/100ml and for FS from 2300 to 9.3×10^4 bacteria/100ml.

This situation comes from the fact that urban discharges flow directly into the river without any previous treatment. As a consequence this pollution has a great impact on public health. Urban waste treatment before its discharge into the river is still strongly recommended to start.

MICROBIOLOGICAL POLLUTION IN NARTA LAGOON AND ITS IMPACT ON FISH

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Surface waters often become part of contaminations which in most cases are of urban, agricultural, industrial origin, etc. This contamination is a consequence of urban residues and especially wastewater, which are not a subject to the cleaning process before being discharged into surface waters. The purpose of this paper is to determine the degree of water and fish pollution from pathogenic microbes, Coliforms fecal and Streptococci fecal (CF/SF), in Narta lagoon during 2012. After the analysis we realized that in the "fishing area" during April, May and June the values for fecal coliforms, are within the permitted limits. March is the only exception where the pollution is above the permitted levels by MPN, $2.3x10^4$/100ml water. "Monastery Bridge" turns out to be within the permitted levels for the CF as well as for the SF. Meanwhile for fecal streptococci in the fish taken in the area of the "Fisherman" the pollution is really high (7500, 2100 and 9300 baktere/100ml). Usually in the "fishing area" can see that the origin of contamination for March and April is from human faeces, while in May the pollution comes from animals and in June the pollution comes from both human faeces mixed with warm-blooded animals.

LONG-TERM OBSERVATIONS OF ZOOBENTHOS IN DEEP-WATER SEWAGE DISCHARGE AREA IN YALTA GULF (SOUTHERN COAST OF CRIMEA, THE BLACK SEA)

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The results of long-term study of the macrozoobenthos in the area of the first in the former USSR deepwater sewage discharge in the Gulf of Yalta are given. In the period from 1969 to 2011, in total 108 macrozoobenthos species were registered at depths of 70 to 94 m. Only 20 species are permanent components of biocenotic complex of bivalve mollusk *Modiolula phaseolina* dwelling in the studied area. Comparatively with 1969 – 70, the reduction of the macrozoobenthos species number from 75 to 39 was registered in 1976 – 1986. The actual recovery of macrobenthos species richness (58 species) and abundance (4541 ind/m^2) in 2010 – 2011 up to the level of the late 1960s - early 1970s, as well as increasing of the average biomass values from 35 g/m^2 (1969 – 1999) to 152 g/m^2 (2010 – 11) indicates the contemporary improvement the ecological status of the deep-water zone of the Yalta Gulf. Accordance between long-term changes in macrozoobenthos development and the commissioning stages of a deep-water discharge of domestic sewage was stated.

THE IMPACT OF TOURISM ON THE ENVIRONMENTAL TRANSFORMATION

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In this volume a complex and comprehensive research of influences of tourism on the environment is carried out. In the research of tourism impacts on environment, a comparative method is used enabling comparisons between domestic and foreign tourist destinations of similar types. Also, the most suitable instruments for managing tourism are elaborated. Special stress is given to: an integral approach to tourism planning, spatial aspects of tourism development, programmes for managing the environment in tourist areas, economic instruments for environmental protection and tourism development, education and training of all participants in tourism activities, information support to sustainable tourism.

WATER QUALITY IN RIVERS WITH DIRECT INFLOW INTO THE RESERVOIR STREZEVO

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The control monitoring of the regime of multipurpose water system Strezevo, and flow along the reservoir, with adequate analysis will enable to determine the temporal and spatial variation in water level in the reservoir as well as water quality in the tributaries, and the water in the reservoir. For realization of this aim, data from physico-chemical analysis of eight years of investigation of river water with direct inflow into accumulation; Strezevska,

Gopeska and Svinjiska river, from 2002-2009, are summarized. Analyzes were performed in two annual seasonal periods – spring and autumn. To present the results high average annual values of the parameters that are the main indicators of water quality were taken. Categorization of water was performed according to the Regulation on classification of waters of the Republic of Macedonia. The results of the investigations indicate that the water quality of these rivers is relatively good.

AVIFAUNA OF SETTLEMENT ZONE OF KRIVOI ROG CITY IN UKRAINE

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The Krivoy Rog city is a large industrial-urban agglomerate in Ukraine. In settlement zone of Krivoi Rog city is nesting 69 species of birds of 14 order currently.

Species composition and nesting's density of birds indicate of the strong difference between riparian avifauna's biotopes of settlement zone and avifauna's biotopes of high-density zones and parks. The spreading of avifauna occurs due to gradient of anthropogenic load on biotopes. 71.0% of species is nesting on riparian lands. 10,1–30,4% of species is nesting in residential districts and 47,8% – in parks. Species composition of birds is low in modernity multistoried buildings of residential districts. Development of riparian ecosystems in settlement zone of Krivoi Rog city is balanced according to the graphs of dominance-diversity. The living enviroment of birds of residential districts in quality on well-worn multistoried buildings. Synanthropic birds dominate in all under investigate biotopes of settlement zone.

Krivoi Rog city has favorable conditions for nesting alien species of birds, which adapted to the conditions of Ukraine about half a century ago. This city has favorable conditions for nesting of birds, which are settling and adapting up to date now too.

CLIMATE CHANGES IMPACT ON ALBANIA WATER RESERVES

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Among the social consequences of climate change, those affect the hydrological cycle and water resources are expected to be serious. The analysis of the likely impacts of the climate change for the Albanian coast reveals that drought, i. e. the prolongation of dry periods during the low – precipitation summer seasons, may be the most important direct consequence which, in turn, may lead to a cascade of secondary potentially harmful impacts, such as shortage of adequate quality drinking water. Decrease in the flow of surface waters, decrease in the recharge of aquifers. Salt water intrusion due to sea level rise may cause increased salinity in coastal aquifers. This could create public health risks and increase the costs of water treatment and upset the ecology of the coastal area. In this paper the present conditions as well as the likely impacts as regards hydrological characteristics and water resources are shortly presented.

NATURAL RADIOACTIVITY IN CLAY BRICKS AND CEMENTS USED IN ALBANIA

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This study has the aim to determine the radioactivity content of clay bricks and cements used as building materials in Albania in order to characterize their potential radiological hazard to humans. Up to 60 samples are investigated in order to measure the natural activity concentrations of ^{226}Ra (^{238}U), ^{232}Th and ^{40}K. The measurements were carried out using a fully automated high-resolution gamma-ray spectrometry using two coupled HPGe detectors (MCA_Rad system). The results indicate that the activity concentration in clay bricks ranges between 490.6 ± 19.4 Bq/kg to 820.3 ± 27.0 Bq/kg for ^{40}K, between 25.8 ± 1.4 Bq/kg to 51.9 ± 1.7 Bq/kg for ^{226}Ra and between 29.2 ± 1.9 Bq/kg to 55.1 ± 2.5 Bq/kg for ^{232}Th. While for cement the radioactivity content range between 107.3 ± 6.2 Bq/kg to 250.8 ± 10.6 Bq/kg for ^{40}K, between 40.9 ± 1.2 Bq/kg to 61.4 ± 1.6 Bq/kg for ^{226}Ra and between 11.5 ± 1.0 Bq/kg to 22.9 ± 1.3 Bq/kg for ^{232}Th. The radiological hazards due to the natural radioactivity in the samples were inferred by calculation of the activity concentration index (ACI). The corresponds activity concentration index range between 0.48 ± 0.02 to 0.63 ± 0.04 for clay bricks and 0.29 ± 0.03 to 0.37 ± 0.02 for cements. These values correspond to an annual effective dose rate lower than 1mSv/y. Indeed due to the final utilization of clay bricks and cements in the dwelling the annual effective dose rate was calculated to range between 0.28 ± 0.02 mSv/y to 0.45 ± 0.04 mSv/y and 0.08 ± 0.04 mSv/y to 0.17 ± 0.02 mSv/y respectively. Therefore, these materials are classified as A1 category (according to European Commission recommendations), i.e. materials used as bulk material without restriction.

RISK ASSESSMENT CODE (RAC) METALS IN SEDIMENTS MOUTH MORAČA

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To assess mobility and potential toxicity of metals, their speciation in sediment is the most important. Metals soluble in acids, ie. easily exchangeable and acid soluble metals are weakly bounded in sediment and in equilibrium with the liquid phase. Thus they become easily bioavailable. To assess the potential mobility and toxicity of metals, and to obtain information about the possible risk of its presence in sediment it was used suitable term so-called "Risk Assessment Code" (RAC). Risk Assessment Code determines the metal content, expressed as a percentage (%) of exchangeable and carbonate fraction, regarding the I fraction of sequential extraction of sediment. The sediment samples were taken at different seasons 2011. at four locations, from left and right mouth of Morača river into Lake Skadar. After mineralization of the sediment samples, concentrations of heavy metals (Cd, Cu, Cr, Co, Mn, Ni, Pb, Zn, V and Sr) was determined by ICP-OES technique. Based on the criteria for Risk Assessment Code, sediment samples are under following categories of risk:

	no risk	low risk	medium risk
Right estuary:	Co, Cr, Mn, Ni, Zn	Cu, Pb, V, Sr	Cd
Left estuary:	Zn	Cu, Co, Cr, Mn, Ni, Pb, V	Cd, Sr

THE REMOVAL OF METRIBUZINE FROM PESTICIDE CONTAMINATED WATERS USING NATURAL AND ACTIVATED PRRENJASI-CLAY

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In the course of selective removal of pesticides from contaminated waters we investigated the adsorptive properties of natural and H_2SO_4-activated Prrenjasi-clay (41° 4'3.88"N; 20°33'2.33"E) toward two metribuzine aqueous solutions. Metribuzine concentrations of 0.200 g/l and 0.400 g/l at 23°C and a clay fraction 0-0.250 mm were considered in this study. The adsorption evolution is studied for a period of 72 hours in each case. For a contact time of 24 h and a metribuzine concentration of 0.200 g/l, the initial recorded values for the natural and activated clay were 0.215 and 0.185 mg/g. Within 48 h the adsorption increases up to 126 % and 163 % respectively, followed by a further increase of 26.5 % and 29.2 % at 72 h. The metribuzine concentration increase to 0.400 g/l enhances the initial adsorption (24 h) of this clay up to 1.356 mg/g in both cases. At such concentration, the max. adsorbed amount recorded in each case is 1.512 and 1.732 mg/g respectively corresponding to the metribuzine-clay contact time of 48 h. Beyond this time, desorption and catalytic metribuzine degradation

of 6.5% and 10.2% strongly disadvantage the overall adsorption process leading considerable deviations from Langmuir-like adsorption kinetic model.

COMPARISON OF THE ADSORPTION CAPACITIES OF TWO ALBANIAN CLAYS FOR THE REMOVAL OF METRIBUZINE FROM CONTAMINATED WATERS

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The distinctive adsorptive properties of clays are very appealing for the removal of organic pollutants from contaminated waters. Taking advantage of this property, we investigated the adsorptive capacities of two natural and H_2SO_4 activated Albanian clays toward metribuzine. A 0.200 g/l metribuzine aqueous solution at 25 °C placed in contact upon stirring with the clays of Brari (41°21'14.49"N; 19°50'17.74"E) and Prrenjasi (41° 4'3.88"N; 20°33'2.33"E) for a period of 72 h, exhibited significantly higher adsorption of the latter. For 24 h clay-pesticide solution contact time, natural Prrenjasi clay adsorbs up to 0.218 mg/g compared to 0.05 mg/g for natural Brari clay. Increases of the clay-pesticide solution contact time leads to enhanced adsorbed amounts for both clays. Within the time interval 48-72 h, the clay of Prrenjasi shows a steeper adsorption compared to Brari clay. The H_2SO_4 activation changes insignificantly the adsorptive properties of Prrenjasi clay, but enhances dramatically the adsorption behavior of Brari clay. Increasing the metribuzine concentration from 0.200 g/l to 0.400 g/l increases the adsorption capacity approx. 7 times for both activated clays. At such metribuzine concentration, activated Prrenjasi clay reaches the max. adsorption of 1.732 mg/g within 48 h of contact time compared to 0.636 mg/g exhibited by Brari clay for 72 h.

ENVIRONMENTAL IMPACT OF NRDP IN ALBANIA: A SMALL STEP FORWARD

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The NRDP objective has been to establish or maintain sustainable, community-based natural resource management in upland and mountainous erosion-prone lands in Albania which lead to enhanced productivity and incomes derived from sustainable resource management, reduced soil degradation, improved water management, and conservation of biodiversity. The work carried out during the project and sub-projects implementation had varying levels of impacts on the surrounding environment, which has been the subject of the audit reported here. In the process of auditing the already established methodology by INTOSAI on Environmental Auditing has been used. A variety of valuation techniques were also used in the auditing, although some clear patterns emerge. The site specific reports revealed a wide range of good practices and a few problems within Albania, although their coverage cannot be claimed as exhaustive in any way. This EPA process demonstrated that the economic analysis of environmental impacts should not be conceived of as an end in itself, but needs to be

directed towards some particular problem. Public participation led to better decisions and involvement of local communities had a positive impact. The advantages of consultation were that potential disagreements and confrontations have been identified early in the process.

MONITORING OF ORGANIC POLLUTANTS IN UPPER PART OF RIVER DRIN

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The Drin River (285km) is the most constant river of Albania. Fed by melting snows from the northern and eastern mountains and by more evenly distributed seasonal precipitation, its flow does not have the extremely varying characteristics of nearly all other Albanian rivers. The total catchment area of the basin is around 19,600 km2 and it includes the Black Drin, White Drin and Buna River, as well as the Shkodra, Ohrid and Prespa lakes. The changes after 90`s have been associated with several problems of anthropogenic pollution and other problems as erosion, flooding and the input of potentially toxic hydrophobic organic pollutants (HOPs) into the river. The present study consist in the determination of a number of persistent organic pollutants in water of river Drini 24 surface water samples at 4 sampling sites in the upper part of the river were collected in four seasons of 2012-2013. A number organo chlorine pesticides (OCPs) were detected and quantified in ng/L by using LLE-GC-μECD analytical method. The concentrations of the OCP species ranged from 8.3-1948 ng/L.

DISTRIBUTION OF LIPOLITIC BACTERIA AND IDENTIFICATION OF COLIPHORM BACTERIA IN THE WATER AT THE LOCALITY VUKOVCI AS AN INDICATOR OF THE PRESENCE OF EMERGENT SUBSTANCES IN SURFACE WATER

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In the natural aquatic environment it is happens physical, chemical and biological processes that influence the content, transformation and movement of constituents in the water. A large number of chemicals causing tremendous pressure on the environment, public health, and of course the biosphere. Examination of water, viewed from the standpoint of sanitary bacteriology and chemistry, which routine works in almost all laboratories to assess hygienic-epidemiological situation of water, often related to the actual situation of water quality, however, water (surface water) represent aquatic ecosystems in which the rule applies interaction environment and organisms in them, and only on that basis can be judged on the quality of surface water. During the November 2012 research water samples from the river Morača locality Vukovci there is a significant presence of lipolitic bacteria : 4900/1ml per sample also coliphorm fecal bacteria of fecal 3100/100 ml and 112/100 ml fecal streptococci. As for presence of emergent substance in the water, there are: aromatic hydrocarbons, pharmaceuticals and resources for personal hygiene. Emergent substance, low-dose and pseudo-persistence can produce extremely strong chemical and ecological stress, which can

totally relate to changes in the environment, mainly due to not knowing and not understanding the toxicological implications. The importance is emphasized by the low doses that emergent substance (hormone-disturbing substances) in pico and nano molar concentrations, mimicking real hormones and mimic their function and cycle.

THE PRESENCE ORGANOCHLORINE PESTICIDE RESIDUES IN VEGETABLES OF TIRANA, ALBANIA

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Organochlorine pesticides are highly lipophilic and stable resulting both in their persistence in the environment and their tendency to pass up the food chain. Residues of these compounds are detectable in vegetables and have been monitored since the 1950s. Exposure data to organochlorine pesticides (OCPs) of vegetables samples were measured in different locations in Tirana. The samples were collected from diferent markets involved in the study. The samples are taken at random. There are set 21 organochlorine pesticides including: dieldrin, aldrin, endrin, lindan, chlordane, heptachlor, DDT, α HCH, β- HCH, γ- HCH, BCH, Heptachlor epoxide, op-DDE, α-endosulfan, pp-DDE, op-DDT, pp-DDD, pp-DDT, β - endosulphan, captane, methoxychlor, mirex. In this work, we have detected mostly the presence of lindane. It has been used to treat food crops and to forestry products, as a seed treatment, a soil treatment, and to treat livestock and pets. Lindane primarily affects the nervous system causing neurotoxic effects. It also appears to cause liver and kidney toxicity, and may act as an endocrine disruptor. Infants and children may be more susceptible to the potential adverse effects of lindane than adults.The samples have been examiated by the methods of FAO, with gaschromatography ECD detector, and the results are frequently used to assess degradation in the environment as well as risks to recipient. The measurements have been calculated in mg/kg levels.numerious studies have linked organochlorine pesticides exposures with cancer and other health effects.

STATISTICAL STUDY ABOUT ASTHMA BRONCHIALIS IN REGIONAL HOSPITAL OF SHKODRA DURING 2008- 2012

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Asthma is one of the most common chronic diseases that globally and currently affect ~300 million people. The prevalence of asthma has increased in affluent countries over the last 30 years but now appears to have stabilized, with ~10–12% of adults and 15% of children affected by this disease. In developing countries where the prevalence of asthma had been much lower, a rising incidence appears to be associated with increased urbanization. Asthma is both common and frequently complicated by the effects of smoking on the lungs; hence, it is difficult to be certain about the natural history of the disease in adults. The aim of this

study is to describe the incidence of all hospitalized cases with asthma bronchial at the Regional Hospital of Shkodra during the period of 2008-2012. The morbidity of this disease is studied according selected age-groups, gender and socio-demographic characteristics (place of residence: rural vs. urban areas). The data are collected at the Statistic Office of Hospital and Statistic Office of Public Health. The method is simple, descriptive and evidences the incidence of cases. The data are elaborated with Microsoft office 2007.

Agroecology

THE PHYSIOLOGICAL VARIATION FOR LEAF AREA IN SOME LOCAL MAIZE (*Zea mays* L.) POPULATION IN AGROECOLOGICAL CONDITIONS IN KOSOVA

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In Kosova, local maize populations still represent important genetic resources used directly by farmers in a small scale. Based on area and production it ranks on the second place among field crops in Kosovo. Physiological parameters, especially the leaf area and related components such as LAI, AGR and CGR are crucial factors in photosynthesis, it is especially important for maize. The experiment study area was located at the Prishtina regions. It lies between latitude 42°38'97'' N and, 21°08'45'' E longitude, elevation 571 m.a.s.l.The ten five (5) local maize populations (LMP) used in this study were collected in different regions of Kosova. The ten LMP constituted the treatment which was laid out in a Randomized Complete Block Design with three replicates (RCBD). The land preparation was done by intensive agro technique. Each plot consisted of a row 5 m long with an inter and intra row plant spacing of 0.75 x 0.25 m to give an equivalent plant populations of 53000 plant ha^{-1} . Each plot had $15m^2$ a total of 40 plants which were considered for data collection. Statistical analysis of data showed significant effect on physiological parameters. The results of investigations of leaf area (LA) in our study showed that local maize populations (LMP) showed a large variation between genotypes.The LMP -44 produced maximum LA (4136.37 $cm^{2)}$. The lowest LA (3747.33 cm^2) was given at the LMP-48. The differences between these LMP were + 389.04 cm^2 or genetic variation was 9.78%.

THE IMPACT OF THE HUMAN FACTOR ON THE EFFECTIVE ENVIRONMENTAL MANAGEMENT

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The processes of industrialization and urbanization, which are prominent in the last few years, have actualized the problem about healthy environment. In such a conditions, the issue about effectively managing the environment , by the human factor, is inevitably raised.

The subject of research in this paper is the issues resulting from polluted environment, and the principles of management of human resources within the environment.

The purpose of this research is to evaluate the impact of human factors on the efficient management of the environment, and to recognize and perceive specific opportunities and prospects for improvement of this process.

The results of this research should help future environment managers, how to deal with the problems and challenges caused as a result of the processes of urbanization and globalization, that harm the environment and produce negative effects on human life.

BRIDGING PROTEIN GAP IN CHANGING CLIMATIC CONDITION IN NORTHERN KOSOVO REGION

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Proteins are the most important ingredients in cattle feed, especially in meat and milk production. Mainly these are being added to the feed by mixing of high protein ingredients such as are: fish flour, meat flour, soybean meal, etc. However proteins which are being included in a bulky feed are highly appreciated. Especially this considers perennial legumes such a s are red clover (*Trifolium Pratense L.*.) and alfalfa (*Medicago sativa*).

In this paper there are presented results of the trials, which have considered content of raw proteins in red clover of the cultivar Lesak, in the second year, in the agro-ecological conditions of Northern Kosovo, on the soil type Eutric Cambisol, depending on mineral nutrition.

Content of proteins in leaves after the first swath in the control variant without added N has value of 19,76%, in the second swath 17,42% and in the third 17,24%. Content of proteins after added 30 kgs/ha of N raised up to 18,72% in the second swath with slightly decrease up to 18,42% in the third swath. Content of proteins in variant with added 3okgs/ha N after first swath compared to the control raised up to 18,68%, but after adding 30kgs/ha of N after second swath raised up to 19,34%, which was significantly higher compared to the control (17,24%).

Climatic factors have been monitored as well, as the total yield in protein production is impacted by the climate change. The vegetation period is monitored, and according to the findings showing wind direction shift, and the trends in air relative humidity, temperature and the ratio of precipitation/evapotranspiration, the strategy for this impact mitigation and protein production adaptation to the actual conditions was proposed.

BIOMASS TO ENERGY AND ENVIRONMENT FOR SUSTAINABLE DEVELOPMENT OF ALBANIA

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Biomass energy is important in Albania's future, consisting of the following four main resources: Urban wastes, agricultural residues, forest residues, and animal wastes. The potential of urban wastes from the main Albanian cities was calculated as approximately 405615 Toe-ton oil equivalents, predicted for the year 2010.

The energy potential from organic wastes was calculated since 1995 with a trend to be increased in the future which should be considered but a more intensive study should be carried out for real validation.

Biomass resources and potentials assessment for Albania has been studied and evaluated within the frame of National Programs of Research and Development supported from the Albanian Ministry of Education and Science and the Agency of Research, Technology and Innovation, for the period 2010-2012.

To assess future biomass production we reviewed biomass resources in Albania and studies on potentials assessment. We hope our team will benefit from the comparison of biomass supply from forestry residues, wood industry residues, agriculture and animal residues.

Our objective was to review and collect information on organic biomass in Albania. The biomass potentials were estimated on the basis of exploitable forestry areas, agriculture areas as well as animal manures. Recently our study has been has been closely related to energy, environment, technology, economy, security, and country development. We were also able to adopt the usage of the specialized engineering software for technical and economical calculations.

QUANTITATIVE CHANGES IN PROTEIN CONTENT OF SYMBIOTIC SYSTEMS OF SOYBEAN UNDER INOCULATION BY RHIZOBIA WITH DIFFERENT EFFECTIVENESS

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Symbiotic nitrogen fixation is an integral part of modern agricultural technologies. Biologization of agricultural production through this process allows not only to significantly increase the quantity and quality of crops, but also to improve the status of agro-ecosystems, which is particularly important under current rapid environmental degradation around the world. The great interest is the development of biotechnological methods to increasing the efficiency of nitrogen fixation, correction of physiological characteristics of symbionts to obtaining the additional possibility to resist of negative stress factors of the environment. The aim of our study was to investigate the possible changes in protein content of soybean symbiotic systems of varying effectiveness.

We have shown the quantitative changes in content of total protein in the roots and nodules of soybean inoculated by active and inactive strains of *Bradyrhizobium japonicum*. Probably these changes are associated with the processes of formation and functioning of the symbiotic apparatus formed between plants and rhizobia.

RHIZOSPHERIC BACTERIA OF CULTIVATED LEGUMES AND THEIR PLANT GROWTH PROMOTING ACTIVITY

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Soil microorganisms play a very important role for biocoenosis support. Due to its ability to produce biological active substances and provide the plants with essential mineral nutrients such as nitrogen and phosphorus, which come from biological nitrogen fixation and phosphate mobilization, rhizobacteria can be used as biofertilisers. Fifty five bacterial isolates were obtained from the rhizosphere of cultivated soybean and pea using selective solid media. Some of them were able to stimulate the growth of rhizobacteria as well as to increase their plant growth promoting activity. Others improved the seed germination and increased

the number of health soybean seedlings while the seeds were treated with these microorganisms. The isolates from the root zone of both legumes did not delay the growth of nodule bacteria. Besides, some of the rhizospheric bacteria stimulated the growth of above ground soybean part.

EFFICIENCY OF MICROBIOLOGICAL PREPARATIONS BASED ON CYANO-RHIZOBIAL ASSOCIATIONS AND NODULE BACTERIA FOR SOYBEAN PRODUCTIVITY

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The use of biological agents based on nitrogen-fixing microorganisms, including rhizobia, is one of the main methods for improving plant productivity, which allows maintaining soil fertility and the ecological balance of the environment. Use of manufactured fertilizers based on the nodule bacteria, and, on the other hand, creation and selection of compatible cyano-rhizobial associations are one of the ways of biological stimulation of legume-rhizobial symbiosis, which increases the importance of the rhizobia-plant interaction and efficiency of bacterial preparations.

In present study efficiency of pre-sowing treatment of soybean (*Glycine max* (L.) Merr.) seeds by manufactured fertilizer Rhizogumin, based on bacterial suspension of soybean nodule bacteria *Bradyrhizobium japonicum* M-8, and inoculation with cyano-rhizobial associations, based on the nodule bacteria, their Tn5 mutants and the cyanobacteria *Nostoc PTV* for plant productivity and resistance to environment was investigated. It was shown that binary inoculation with rhizobia and cyanobacteria may have a positive effect in case of correctly chosen inoculation agents and their ratio. Obtained data on the influence of complex bacterization for soybean growth, development, quantitative/qualitative indexes of productivity under legume-rhizobial symbiotic conditions indicate the prospects of bacterial preparations based on *Bradyrhizobium japonicum* M-8 in manufactured fertilizer Rhizogumin and cyanobacteria-rhizobia associations, including their Tn5-mutant strains.

POTENTIAL USES OF GRAPE LEAVES FOR OBTAINING NATURAL ANTIOXIDANTS

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The volume of the grape waste produced directly relates to the volume of grapes pressed and in turn depends on the specific climatic conditions of the relevant vintage. By processing 100 kilograms of grape-vine approximately 20-25 kilograms of grape marc is produced. Recently, extraction of polyphenols from grape marc has emerged as an opportune and vital business for the wine and food industry. The aim of this work is to evaluate grape leaves as a potential source of natural antioxidants – polyphenols for their possible use as dietary supplement or

food antioxidants. To this purpose antioxidant capacity and contents of phenolic compounds of the leaves extracts of five grape varieties of *Vitis vinifera* L (Vranac, Prokupac, Merlot, Gamay and Italian Rizling), grown in Serbia were investigated. The analysis show high content of polyphenols reflecting their high antioxidant activity (R^2 = 0.9819, $p<0.01$). According to the obtained results, the leaves extracts, can be considered rich natural source of phenolic compounds with good antioxidant properties.

THE FLORISTIC COMPOSITION OF THE NATURAL PASTURES MOUNTAINOUS MASSIVE OF NOVO BRDA

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Meadows (14%) and pastures (30.2%) occupy a significant part of the land in Kosovo and they are very important source of fodder for the livestock and also for the soil protection against erosion. This article presents data of the research on the floristic composition of the pastures in the Novo Berda area. This massive is located in the eastern part of Kosovo plain, which is characterised by a medium continental climate. It has been noted that there has been no authentic study of the floristic composition of the plants in their associations. This study gives an outline of the floristic composition of this massive, and also an idea on the producing capacity of the wet and dry mass of the grass in these pastures and their quality. The aim of the investigations was to examine the floristic composition and green fodder yield and quality at a number of representative sites, having in mind the distribution of natural meadows and pastures. From these studies we can survey the pasture capacity, the ratio of the edible versus non- edible vegetation, poisonous plants and the necessity of pasture upgrading. The data of the study show the presence of variation related to the floristic composition and plant cohabitation. The average presence of grasses was higher, 48,51% compared with legumes of 25,36% and other species 26,13%. Data from the table 4 show that there is a significant difference between grasses and legumes on crude protein content. The pastures with higher content of legumes and lower per cent of other plants were characterized by high content of crude proteins. The presence of legumes was relatively higher compared with investigation data presented from other authors in the region.

NEW APPROACH TO TREATMENT OF CARNIOLAN HONEY BEE (*Apis mellifera carnica*) AGAINST PARASITE *Varroa destructor*

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Varroa destructor is a parasitic mite that lives at the expense of Carniolan honeybee *(Apis mellifera carnica*). It reproduces only in a bee colony. Varroa mites have adapted well and evolutionally "outmaneuvered" their host. This is one of the classic examples of the so-called "arms race" between parasites and hosts. This antagonistic relationship depends on pathogenic alleles of the parasite and host's alleles that ensure its survival. As a result of this interaction, allelic frequencies vary in a certain period depending on virulence, population

resistance and mutation rate, where individual genotypes are favored to increase host's chances of survival. The mechanism of pathogenesis of *Varroa destructor* is quite simple. Parasite adheres to the bee's body, gradually exhausting its hemolymph. The significant increase in the number of these parasites leads to depletion of bee colonies, usually in late fall or early spring. In this study, three treatment methods against *Varroa destructor* were used. The first method is the traditional treatment with Varolik solution that contains armitraz. In the second and third, a mixture of natural substances and BeeVital hive clean solution were used respectivelly. Results show that second and third methods were far more effective, with Varolik not substantially reducing varroa numbers. This paper proposes use of organic products for treatment of *Varroa destructor*.

HEAVY METAL CONCENTRATIONS IN VEGETABLES WITH GROWTH STAGE AND PLANT SPECIES VARIATIONS

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Vegetables constitute an important part of the human diet since there contain carbohydrates, proteins, as well as vitamins, minerals and heavy metals. Heavy metals are one of a range of important types of contaminants that can be found on the surface and in the tissue of fresh vegetables (Bigdeli and Seilsepour, 2008). A number of elements, such as lead (Pb), cadmium (Cd), nickel (Ni), cobalt (Co), chromium (Cr), Copper (Cu) and Selenium (Se) (IV) can be harmful to plants and humans even at quite low concentrations. Soil pollution is caused by misuse of the soil, such as poor agricultural practices, disposal of industrial and urban wastes, etc.

The research was conducted in order to see the concentration of heavy metals in leafy vegetables spinach - *Spinacia oleracea*, garlic - *Allium sativum* and onion - *Allium cepa*. Spinach, garlic and onion seeds were sown on 23rd November 2011; samples for analysis of these plants were taken at different stages - 20, 30, 40 and 50 days after sowing. The results showed that the concentration of lead, zinc, cadmium, nickel, and cobalt increased with increasing age of the plant. The percentage of increase of heavy metals was higher from 20th to 30th day, compared to that between 30th and 40th day.

The concentration of heavy metals gradually increases in the early stage of the plant growth, and gradually declines in later stages of growth. The significant differences ($P < 0.01$) were observed between the mean metal concentrations in the three vegetables species. Higher concentrations of lead and cadmium were found in spinach, compared to garlic and onion. The order of heavy metal level in different vegetables was Cd<Co<Pb<Ni<Cr. The value of the correlation coefficient soil-plant was highest for cadmium and lowest for nickel.

ENVIRONMENTAL IMPACTS IN CHARACTERIZATION OF POLYPHENOLICS CHANGES DURING RED WINE MICROOXYGENATION

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Micro oxygenation as a innovative wine-making technique, consist in the addition of small and controlled amounts of oxygen after first alcoholic fermentation and before malolactic fermentation. The objectives of the process includes improved mouth feel (body and texture), increased oxidative stability ,color enhanced stability and decreased vegetative aroma during polyphenols changes process.A very important factor is polyphenolics organic grape composition strongly associated with the environment geographical specifics area in which it is grown the grape.This study will show the characterization of polyphenols changes of anthocyanins, flavonoids, the color intensity and total polyphenols index, maturity and oxidation index during the process of microoxygenation on the wine that comes from a specific geographic area in the southeastern region of the country. Analytical results show periodic increases of color intensity and tonality, reduction level of free anthocyanis and flavonoids free because of polycondensation reactions between tannins and anthocyanins , increased total polyphenols index and decrease the ratio between the flavonoids and anthocyanins offering a red stabilize wine proved by sensory degustation tasting for color intensity, tonality, body, tannic perception, taste and remained backtaste related with specific environmental impacts.

Ecological Education & Ecology and NGO

DIFFERENT MODES OF INTEGRATING ENVIRONMENTAL EDUCATION INTO THE ALBANIAN EDUCATION CURRICULUM

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Environmental education is becoming important dimension in the overall civic education of children in Albania aiming at Albanian citizens live in harmony with the environment. The effectiveness of introducing this type education acquires knowledge, values and experiences. This type of education starts in primary education, from the first grade to six one, and later in the secondary education structured on knowledge, skills and behaviour patterns.. The study is performed through content analysis, comparison and synthesis of topics and illustrations linked to theoretical and practical aspects of local, regional and national environmental problems. It is introduced within the obligatory curricula of the primary education, as well as in the obligatory and extra curricula in the secondary education. Most of the information and volume of knowledge comes to children through Nature Knowledge and Biology subjects. The Educational curriculum is currently under reforming process, therefore specific recommendations are provided to teachers and school principals for further improvement of education methodologies, especially through extra curricula program.

USE OF MOSS SPECIES AS A BIOLOGICAL MATERIAL IN THE TEACHING BIOLOGY AND ECOLOGY

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Use of herbarised or fresh plant material has a fixed value in the teaching of biology. This paper is a proposal for the use of certain moss species in the teaching of biology and ecology. Ten moss species are proposed for the use in classroom. For each species there is a photography given that explains how to use the classes and the distribution of species listed in the municipality of Podgorica. Data on the distribution of species were obtained during field research conducted from January to December 2012, and the use of literature data. The aim of this work is the type of moss, which will help teachers to deliver educational content in biology and ecology and to improve the quality of teaching.

ENVIRONMENTAL ETHIC VALUES THROUGH ECOLOGICAL EDUCATION IN ONE ROMANIAN MASTER DEGREE PROGRAMME

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The education gives knowledge and values, shaping the attitudes and behaviours. The ecological education concept follows to change the people attitude regarding the nature, to develop a responsible environmental behaviour and change the present unresponsive attitude to a friendly attitude of human being to the nature. Now, in Romania, the principal challenges

to achieve these aims are the lack of knowledge, cultural traditions and the present material values of live and religious education.

In the Environmental Consultancy master degree programme in our university, the students follow the discipline *Environmental Ethics* and, as part of the seminar, we discuss on different topics on human moral and environmental ethics. However, from the model of Christian Decalogue, representing the moral underpinning human relationship with peers in the Romanian society, the students are required to elaborate a proposal Decalogue of Man relationship with Nature as an exercise theme in this discipline.

We try to analyse the knowledge level and ethical attitudes of the students resulted through these debate topics. Using the debate exercise, we try also to see where is situated the present relation between the mankind and nature, respectively, if we can found inside us the capacity to change the way to look the other living beings on the Earth through the ecological education.

ENVIRONMENTAL EDUCATION IN PRIMARY AND SECONDARY SCHOOLS IN MOSTAR AREA

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Environment and environmental issues are increasingly the center of educational institutions. The student immediately informs its environment and environmental threats in the school, through the mass media, etc. Environmental education is an individual characteristic that each person need to achieve in order to properly treat the environment. Being educated does not always mean to be environmentally educated. In our work we analyzed the opinions and attitudes of students in elementary and secondary schools on how they perceive their environment and how environment can be preserved, taking into account that the young generation is a key factor for the future development and environmental preservation. Also, we have examined the opinion on whether schools are enough involved to spread environmental awareness among young people, and what alternative solutions can be used to solve the problem of lack of environmental education in educational institutions.

BIOETHICS AND ECOLOGICAL EDUCATION IN BIOLOGY CURRICULA IN MIDDLE HIGH SCHOOL IN ALBANIA

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During our study we tend to analyze all the bioethical concepts treated in biology curricula in middle high school in Albania and how they prepare the students to face and solve different ethical issues regarding environment. So for this, we studied all the biology programs and the texts approved by Ministry of Education and Science of Albania. During our work we grouped bioethical concepts by the way they are applicable: 1. Descriptive bioethics – students are taught to respect all the living things and that their actions do impress the world they live in, especially the environment. 2. Ordering bioethics – students are taught what is

ethically right or wrong and how to analyze the situation before they make a choice or take a decision. So, before they act, they think twice what is best for them and the environment they live in. 3. Interactive bioethics – students are capable to discus and debate within the society or the community.

As a conclusion we can say that in the future, it would be better that bioethical concepts occupy a bigger place in biology curricula in middle high school.

THE ROLE OF POISONOUS PLANT STUDY IN THE FORMATION OF MEDICAL STUDENT ECOLOGICAL OUTLOOK

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The environmental education is currently an obligatory element of medical education because this is helping for students to understand basic ecological knowledge and the formation in the future medics the ecological culture, environmental outlook and conscious relationship with nature. Each physician must have information about the variety of toxic plants and their effect on the human body. First of all it is necessary to find the effective ways for overcome the negative actions of poisonous plants as well as for the prevention of poisoning. At the same time the majority of poisonous plants are valuable medicinal plants. In the process of learning the outlook for the rational use of poisonous herbs in medicine due attention should be given to the study of plant communities and their individual components. It is important to use real-life examples to make students comprehend the necessity of preservation of natural ecosystems. Some species of poisonous plants require special protection. Uncontrolled gathering of medicinal herbs leads to decrease of population of various plants, notably endemic, relict species and those habitats. Thus of prime importance is to direct the student's attention to necessity of protection of biodiversity and conservation of poisonous medical plant resources.

OPTIMIZING THE EDUCATIONAL PROCESS THROUGH MULTIDISCIPLINARY APPROACH TO ECOLOGICAL EDUCATION TOPICS

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The educational process can be optimized in ecological education through multidisciplinary approach. In order to increase school performance by multidisciplinary ecological education, has organized an experimental research in the eighth grade. The experiment started with the questionnaire (pre-test) with a diagnostics function.

Based on the diagnosis of the target group, the research was guided by the idea of demonstrating the link between knowledge, skills and attitudes acquired by students through multidisciplinary education and increase school performance.

Research continued by introducing the teaching - learning - assessment of methodological changes which consisted of multidisciplinary approaches proposed.

At the end of the activities undertaken, the initial questionnaire was applied again.

ECOLOGY AND MULTIDISCIPLINARY EDUCATION

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Most students are excited to use the methods and tools of other disciplines (literature, art, physics, mathematics, chemistry, anatomy) in achieving ecological education. It made easily capturing the attention and time is set in a pleasant, relaxed, open and emotional implications. Students easily acquire new knowledge about anthropogenic ecosystems through multidisciplinary connections.

Multidisciplinary approach favors students with poor results at school, because of the freedom of expression of ideas, emotions, feelings, revealing different aspects of their personality;

Connections made with literature, arts facilitates detection of student learning style (visual, auditory, tactile etc.) and the identification of each type of intelligence (emotional, linguistic, musical, naturalist, interpersonal, intrapersonal) with significant meanings for both formative students and the teacher (differentiated design of teaching - learning - assessment);
Lessons opens up collaboration between teachers of biology, literature, music education, aesthetic education, the organization of environmental actions and artistic activities on different occasions offered by ecological events calendar.

BLENDING THE TEACHING OF ENVIRONMENTAL MATTERS AND ENGLISH AS A SECOND OR FOREIGN LANGUAGE

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Environmental education is a lifelong process which handles inter-rational components of the natural world and of that created by man, leading to mandatory management of the natural environment.

Shared processing curriculum has advantages as learning English and learning environmental education. We can't call our English teaching successful if our students, however fluent, are ignorant of world problems, have no social conscience by using their communication skills for international crime, exploitation, oppression or environmental destruction, Cates (1997). For this reason there is a growing interest for introducing environmental education in teaching English as a second/foreign language. The purpose of the incorporation of environmental education into teaching English as a second/foreign language is to raise the environmental awareness of global environmental problems. Thus in English languages teaching the positive effects are:

- It facilitates learning new words and their meaning

If an item is pre-processed in mother tongue, then one of the most important goals of learning new words in the English language is realized, i.e. learning the meaning of these words. By learning some concepts during a class of environmental education such as biotope, biocenosis, ecosystem etc., students' understanding of these concepts in English will be facilitated.

- It enhances students' concentration during class

Experiences from practice show that, when the content is re-processed, as in our case with environmental education and English language, it facilitates the prolongation of concentration. Prolonged concentration of learners also means easier learning of new concepts in both native and foreign language. If there is no concentration, the activities that take place during class will be boring, uninteresting and, eventually, everything will be useless.

- It reduces tension and fear of foreign languages

As previously mentioned, the treatment of known content not only increases the concentration, but also significantly reduces the tension and fear of foreign languages. This fear is manifested as a feeling of discomfort, tension and uncertainty that overwhelm you when you need to talk, read or write English, or when you need to understand someone who speaks English.

Conservation of Biodiversity and Geodiversity

PRELIMINARY ORNITHOLOGICAL OBSERVATIONS IN THE AREA OF URZICUTA SETTLEMENT (DOLJ COUNTY-ROMANIA)

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The paper outlines the preliminary results obtained from ornithological research in the area of Urzicuta village, located in the plain area from the central-southern part of Dolj County (southwestern Romania). The studied area has a wide range of natural and anthropogenic biotopes, such as water and / or semi-aquatic (streams, ponds, wetlands, lake) and terrestrial (scrubland, grassland, arable land, etc.) biotopes, which represent real refuges necessary for feeding, sheltering and reproduction of a great number of bird species. Many of the species recorded during our investigations (conducted in July-August 2012 and March-June 2013) are of European conservation interest, e.g. *Ixobrychus minutus, Nycticorax nycticorax, Ciconia ciconia, Anas querquedula, Falco tinnunculus, Falco vespertinus, Chlidonias hybrida, Picus viridis, Dendrocopos syriacus, Anthus campestris, Lanius collurio*, etc. and require a great deal of attention in order to reduce their vulnerability degree and / or the high risk of endangerment.

The area we refer to drew our attention through the physicochemical features of Lake Ionele located within its territory, declared a protected area of national interest (Code: 2395), due to its mineralized composition and moderate salinity. Although the lake is only 3.2 ha and the water level drops significantly (in droughty summers it dries), the resulted sludge acquires therapeutic properties, which encourages some balneary activities. Therefore, our study, besides the contribution to local fauna studies, aims to highlight the effects of anthropogenic factors on the bird coenosis formed within a lowland ecosystem characterized by spa features.

ANALYSIS OF SYNERGIES BETWEEN THE VEGETATIONAL COVER AND THE INTENSITY OF IMPACT WATER EROSION

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The method of ecological profiling shows the increase of anthropogenic transformation of vegetational cover, depending on the intensity of water erosion and the steepness of slope (for example watershed of Southern slope of the Crimean Mountains). Analysis of vegetational cover reflects the cumulative effect of the interaction of exogenous and endogenous ecological factors. Determining exogenous factors are anthropogenic. Secondary factors are endogenous factors of interspecific and intraspecific competition between sylvatic and non-sylvatic plants that fill the vacant econiche.

Herb stratum is the most sensitive indicator of the water erosion intensity. Herb stratum of erosional degraded simply plots are poor. Species of *Poaceae, Caryophyllaceae* and *Asteraceae* are the most representative. Number of cryptophytes and therophytes increases by gradient of erosional degradation. Phanerophytes are absent in intense simply

plot. The biological spectrum indicates the presence of peculiar morphological adaptations of plants to soil conditions constantly changed.

Increase of explerents established by gradient of soil water erosion digression. Limiting ecological factors are moisture and salt regime. Gradually increase of species with wide ecological amplitude (mesotopic, hemieurytopic, eurytopic) is typical. Identified regularities testify to erosional and anthropogenic enhancement of forest ecosystems degradation. This causes a reduction of forests hydrological role in the watershed, the increasing of soil erosion intensity.

OPTIMIZATION OF EXTRACTION OF ALKALOIDS FROM *GYMNOSPERMIUM MALOI*, A NEW ENDEMIC SPECIES FROM ALBANIA

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Gymnospermium maloi is a new endemic species of Albania, discovered recently in Gjirokastra district. The fresh parts of the plant are known so far as the poison for the animals in this district[1]. In our laboratory we were interested in isolating the alkaloid components of this plant. The areal parts, flowers and the tubers of the species were collected early in April and dried separately at room temperature. For the purpose of method optimization only the areal part was used. Different extraction conditions were investigated. The best yield was obtained after three 24 hours extractions with methanol at room temperature. Normal acidic, followed by basic, solvent extraction with chloroform was applied in order to separate the alkaloids from the other organics. Further purification with column chromatography in silicagel gave a series of single compounds giving a positive result with Dragendorff reagent.

STUDY ON SECONDARY METABOLITES OF CULTIVATED AND WILD *SIDERITIS SCARDICA,* GROWN IN ALBANIA

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Sideritis scardica is plant grown wild in Albania. Because of its use as an herbal tea, the demand in the market has increased lately and in several parts of Albania it has started being cultivated.

In this work, a study on chemical composition of extracts of cultivated and wild *sideritis* grown in the region of Erseka, in Albania, will be presented. The plants were grown and collected in the same place, at an altitude of 1200m above sea level. The extracts were taken with water distillation, soxhlet extraction using organic solvents and subcritical CO_2. The volatile component were analysed with GC-FID and identified with GC-MS. A very similar composition and yield of extracts of cultivated and wild *siderits* was observed. The extraction with subcritical CO_2 gave some very interesting results, because the changes in the

temperature of extraction gave a very different chemical composition of the crude extracts. Lower temperature shown a high selectivity in some secondary metabolites.

DIVERSITY OF PLANT ENDEMIC SPECIES FROM THE LOCALITIES OSANICI AND KRUZEVAC HILL (MUNICIPALITY STOLAC)

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Herzegovina area is characterized by a high degree of biological diversity of plant taxa that have a narrow range of distribution. This area, which is inhabited by a number of endemic and rare plant and animal species, is a center for conservation, formation and displacement of many species in the Balkans.

Endemic flora in Stolac is very pronounced due to specific geographical location, the influence of the Adriatic Sea, the diversity in terms of geology and soil science, altitude, expressed relief. Stolac area can be an area of particular importance in botanical terms because of the appearance of a large number of endemic plant species. The method used for the presentation of the diagnostic values of plant communities is the Braun-Blanquet method.

At the Ošanići site, we found presence of 8 endemic species, while at the mountain Križevac a total of 9 endemic species and subspecies were identified.

Research in the area of Stolac should continue and this work is a small contribution to understanding of endemic plants in this part of Herzegovina.

NEW HABITAT OF EUROPEAN BEAVER *CASTOR FIBER* LINNAEUS (1758) IN BOSNIA AND HERZEGOVINA

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Previous records on the distribution of the European beaver on the Balkan Peninsula indicate presence of several isolated and small populations. After Halley and Rosell (2002), estimated population size ranges from six in Sloveina, thirty in Serbia to 180in Croatia. In Bosnia and Herzegovina this species was recorded only in the watershed of Vrbas river in central Bosnia. During field investigation conducted in May 2013 on the territory of northeastern Bosnia, in the watershed of Spreča river, we recorded four beaver's nests counting eight adults and fourteen yearlings. The investigated area encompasses old riverbed of Spreča river at altitude of 184 meters, on the area of 6 hectares with average water depth of 2,5m. In riparian belt occur the following ecosystem types: hygrophilous woods, hygrophilous meadows, mesophilous transitional woods and scrubs, plant communities with common cattail, communities of floating vegetation and communities of submerse vegetation. Since in the lower part of the watercourse occur the same ecosystem types it could be expected further dispersal of European beaver population downstreams. Since it is on the Red list of the fauna

in Federation of Bosnia and Herzegovina, it is necessary to undertake appropriate protection measures which include designation of protected landscape.

CONSERVATION OF THE ENDANGERED FUNGI AND FUNGI-LIKE ORGANISMS IN UKRAINE

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In today's world interest in nature conservation has strongly grown up concerning on protection of biodiversity and endangered species especially. European field mycologists working on macromycetes concentrated their activity on research of endangered macrofungi distribution and on observations for the state of its habitats. The same trends in fungal conservation are followed in Ukraine. Comparison of macrofungi numbers included in two editions of the "Red Book of Ukraine" 1996 and 2009 has shown increase from 30 species to 57 ones. According to our data, the main reason of endangered fungal species increase consists in disturbance or full destruction of its habitats. Noticeable influence on decrease of endangered species locations exerted reduction of mountain bogs for *Bovista paludosa*, primeval, virgin and old-growth forests for *Phylloporus pelletieri* (Ukrainian Carpathians), disturbance of sand soils in pine forests and sea dunes for *Myriostoma coliforme* (Steppe zone of Ukraine) etc. In the last decade (2011) as the species on the edge of survival, except macromycetes, fungi-like organisms, for example myxomycete *Diacheopsis metallia,* were proposed for including in the IUCN Red List. Our studies of myxomycetes in Ukraine allow to prepare the list of species (4) for entering the new edition of the "Red Book of Ukraine". One of them *Oligonema aurantium* is proposed as the first candidate to the document since its record in Left-Bank Polissyia (Ukraine, Sumy region) is the second one in the world after *locus classicus* (Belgium, vicinities of Antwerp).

CHAROPHYTES (Charales) OF ULCINJ AND VELIKA PLAŽA BEACH, MONTENEGRO

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Paper presents results of investigation of algae in Charales order, as a part of Biodiversity monitoring programme in Montenegro during the 2012. at the area of Velika plaža beach in Ulcinj.

Total number of 9 taxa is registered, and four of them were first time noted in the ponds behind of Velika plaža beach. Based on the IUCN criteria, threat category of Charophytes in Montenegro are: *C.hispida* and *N. tenuissima* are critically endangered (CR), *C.tenuispina* endangered (EN), *C. virgata* and *C. aspera* are vulnerable (VU) and *C.globularis*, *C. contraria C.vulgaris* have low risk and vulnerability. According to the

criteria of Natura 2000 habitats directive, in the area of Velika plaža habitats classified as 2190 Wet mobile dunes are present.

The paper contents results of analysis of the factors that threaten the survival of Charophytes and their habitats, and measures for biotope protection are presented

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THE CONTRIBUTION TO THE KNOWLEDGE OF MACROMYCETES OF MONTENEGRO

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The paper presents results of investigations on macromycetes from several localities in Montenegro, during the 2012 year. The list contained 58 species. All species belong to the phyla Basidiomycota. Species *Tricholoma sejunctum* have been recorded fot the first time in Montenegro.

AVIFAUNA'S MONITORING IN SOME TERRESTRIAL ECOSYSTEMS ADJACENT OF GALATI (GALAȚI COUNTY)

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This paper presents ornithological observations made in a terrestrial ecosystem adjacent of Galati (Galati County) from December 2011 to December 2012. The study area is located near the protected natural area „Parcul Lower Everglade of Inferior Prut National Park". There were identified a number of 105 bird species belonging to 38 families and 16 orders. There were followed different aspects of systematic classification, the phenological, ecological, zoogeographical, reproduction and the conservation status of the species. The most frequently work methods used were the transect method and the direct observation method. According to the Birds Directive, there were identified 24 species belonging to Annex I: *Pelecanus onocrotalus, Phalacrocorax pygmaeus, Plegadis falcinellus, Platalea Leucorodia, Falco columbarius, Falco vespertinus, Recurvirostra avocetta, Caprimulgus europaeus, Alcedo atthis, Coracias garrulus etc.*

CONTRIBUTIONS TO THE BRYOPHYTE FLORA OF ULCINJ, MONTENEGRO

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During a field investigation carried out in 2012 at Velika plaža (Ulcinj, Montenegro), a 54 bryophyte taxa (6 liverworts and 48 mosses) were collected. All taxa are reported for the first time for Ulcinj region. For liverworts *Riccia cavernosa* and *Riccia trabutiana* this area is second known sites in the Montenegro. Moss *Campyliadelphus chrysophyllus* is protected by law in Montenegro.

FISSIDENS FONTANUS (BACH.PYL.) STEUD., NEW AQUATIC MOSS IN BRYOFLORA OF MONTENEGRO

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During the field investigations of semi-natural habitats of Podgorica city area, a new aquatic moss was reported for the flora of Montenegro - *Fissidens fontanus* (Bach.Pyl.) Steud., which is the first record for Montenegro. This paper presents data about the site, ecology and distribution of species.

GENETIC CHARACTERIZATION AND PHENOTYPE DIVERSITY OF COMMON BEANS LANDRACES (Pharsalus vulgaris L.) IN KOSOVA

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For a long time common bean landraces (Phaseolus vulgaris L.) on farm cultivation in different regions of Kosovo, and as consequence were developed diversity and variability among them. The genetic diversity among landraces makes them a valuable source as potential donor of genes for breeding and development of new cultivars of common bean. A set of 30 landraces were collected from different sites across the country. For this purpose was conducted a parallel experimental trial on laboratory and in the field at Didactic Experimental Farm (DEF) of the Faculty. The factorial trial was set up as randomized complete block design (RCBD) with three replications. Statistical analyses were performed using ANOVA by software Minitab-16. For genotype characterization of landraces were used IBPGR-Descriptor, and for each parameter were estimated 10 plants per replication. The aim of this research was genetic and phenotype characterisation for diversity among common bean landraces, belonging to Gene Bank of Kosovo (GBK). Genotype and phenotype

characterization was done for: Emerging cotyledon colour (ECC), Hypocotyls pigmentation (HP), Leaf colour of chlorophyll (LCC), Leaf colour of anthocyanin (LCA) and Days to flowering (DF). Results show a significant difference (LSDp= 0.05 and 0.01) among landraces for estimated characters.

STUDY OF THE PHYSICAL-CHEMICAL PARAMETERS OF *OLEUM HYPERICI* PRODUCED UNDER MICROWAVE EXTRACTION OF *HYPERICUM PERFORATUM*

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Olive and olive oil have an important nutritive and economic significance for Albania. Numerous studies have been conducted on olives and olive oil which testify the great nutritive benefits that olive oil has. One of the most important efforts in improving its nutritive value is the addition of other substances coming from the extraction of medicinal plants. In this presentation we will present our study on physical and chemical parameters changes of olive oil after it has extracted *Hypericum perforatum*.

For that purpose BIO olive oil and BIO local plants were chosen. Lots of tests about the extraction of this plant in olive oil were conducted. The main conditions studied were: amount of plant used (2%) and temperature under microwave extraction of *Hypericum Perforatum* in olive oil. Parameters of olive oil followed in order to see if any changes had occurred were: color, density, acidity, peroxides and also the chemical profile of olive oil. These parameters were studied for each case and for different intervals of time in order to optimize the experiment duration. The comparison of chemical composition of oil before and after extraction allowed us to determine the components of the plant extracted from the oil. The chemical analyses of fatty acid methyl esters (FAME) were done by GC-MS.

Allium pthioticum BOISS. & HELDR., *Allium victorialis* L. and *Melampyrum bihariense* A. KERNER – THREE NEW SPECIES IN THE FLORA OF ALBANIA

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In the flora of Albania, the genus *Allium* comprises ca. 23 species whereas the genus *Melampyrum* L. comprises between five and six species. In the following, based on the extensive research carried out during the y. 2010-2013, two other onions and one Cow-wheat species have been recorded as new for the flora of Albania. The Victory onion and Cow-wheat were found in Shishtaveci area, Kukësi district, between 1250 and 2100 m and *A. phthioticum* in Shebeniku and Kunora e Lurës Mts, between 1550 and 1900 m asl. They occur in different habitat types of ophiolithic and siliceous substrates in the northeastern parts of the country. The Data on taxonomy, ecology, population size and distribution of *Allium pthioticum*, *Allium victorialis* and *Melampyrum bihariense* are given in this paper.

EX SITU CONSERVATION OF ENDANGERED BULGARIAN *ARTEMISIA ERIANTHA* TEN. (ASTERACEAE) BY *IN VITRO* CULTURES

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The caespitose perennial *Artemisia eriantha* Ten. (Asteraceae) is an endangered species included in the Red Data Book of Bulgaria due to low reproduction of the species and damage by tourists. It is a glacial relict protected by the Bulgarian Biodiversity Act and included as 'vulnerable' in the IUCN Red List. The species is distributed in the mountains of Southern and Central Europe: Pyrenees, Southwestern Alps, Apennines, The Carpathians and the Balkan Peninsula mountains. The small and isolated populations are found within Rila and Pirin National Parks, sites of Natura 2000 and a natural reserve in the Central Balkan range. The *in vitro* cultivation is a current advanced method for *ex situ* conservation of endangered plant species. We successfully initiated *in vitro* cultures from *A. eriantha* seeds on water agar and half-strength MS medium with a subsequent micropropagation and whole-plant regeneration on plain MS medium.

APHYLLOPHOROID FUNGI (BASIDIOMYCOTA) OF BIOTOPES ON KYIVSKE PLATO, UKRAINE

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Aphyllophoroid fungi are polyphyletic group of organisms, which distributed over several families and orders among the division Basidiomycota. They execute decay of cellulose, hemicellulose and lignin of wood. These fungi are the major wooddecaying organisms. They play an important role in the nutrient cycle of forest ecosystems. At the same time aphyllophoroid fungi cause the development of two types of fungal wood rot: brown (destructive) and white (corrosive) rot. This process leads to the emergence and development of forest disease.

161 species, 89 genera, 34 families and 11 orders of aphyllophoroid fungi are identify in forests and cultivated agricultural biotopes on Kyivske Plato. Investigated biotopes due to “temporary flooded willow forests with *Salix alba* L.”, “birch fresh and dry forests (Betulo-Quercetum roboris)”, “alder eutrophic swamp forests (Alnetea glutinosae)”, “sub-continental hornbeam-oak forests (Carpinion betuli)”, “biotopes dominated by deciduous trees (Chelidonio-Robinion: *Robinia pseudoacacia* L., *Acer negundo* L.)”, “parks” and “fruit and ornamental gardens”. Distribution and ecological characteristic of each species of aphyllophoroid fungi in various biotopes on investigated area are given too.

IN VITRO CULTIVATION AND ESSENTIAL OIL COMPOSITION OF THE BULGARIAN ENDEMIC PLANT *Achillea thracica* VELEN.

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The genus *Achillea* (fam. Asteraceae) is presented globally by 85 species, with 19 naturally distributed species in Bulgaria. *Achillea thracica* Velen., is a Bulgarian endemic under the protection of the Bulgarian Biodiversity Law (2002) and is included in the Red Data Book of Bulgaria with the national conservation status: critically endangered (CR). The species is in the Bern Convention on the Conservation of the European Wildlife and Natural Habitats as "rare" (1979) and in the IUCN's European Red List of Vascular Plants as "Data Deficient". The aim of the presented study was to establish an effective protocol for initiation and micropropagation of *in vitro* culture and to determine the essential oil composition from the proposed threatened species. The mercuric chloride (0.1 %) was applied in sterilization of fresh stem explants from *A. thracica* and 9 explants survived out of 50 (18 %) and continued to propagate. Successful *in vitro* cultivation was achieved on hormone-free basal MS (Murashige and Skoog) medium with 30 g/l sucrose and 8 g/l agar. In addition the biosynthetic potential of plants was evaluated by comparison essential oil composition of *in vivo* grown, *in vitro* cultivated and *ex vitro* adapted plants of *A. thracica*.

Acknowledgements: This work was financially supported by the grand № SU-23-2013 of Scientific research fund at Sofia University, Bulgaria.

Ophioglossum vulgatum L. (OPHIOGLOSSACEAE) IN THE FLORA OF KOSOVO AND METOHIJA (SERBIA)

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Until recently, relatively little has been known of the presence of this species in the flora of Kosovo and Metohija. The first reliable data were given for the flora of humid lowland meadows in the vicinity of Urosevac, Kosovo, and Klina, close to Pec, Metohija (Hundozi, 1983-1986).

In the meantime, the revision of the first book on flora of Serbia appeared, as well as a supplement to the flora of Serbia within the ninth and tenth volumes; however, this type of fern was not mentioned for Kosovo and Metohija region. Our investigation of flora in Ibarski Kolasin and Rogozna Mt. found a few new localities, which presents a new contribution to the horology of this species on Kosmet territory. For this reason, they may serve as reliable data referring to localities and prevalence of this species in writing a new version of the first volume on the flora of Serbia,which is in progress.

However, our field investigation, that has lasted in this area for almost ten years, can definitely prove that *Ophioglossum vulgatum* is much more prevalent and more frequently present in Kosovo and Metohija flora than believed so far.

CONSERVATION OF MEADOW VEGETATION OF THE FOREST AND FOREST-STEPPE ZONES OF UKRAINE IN SITU AND EX SITU

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The aim of the work was to analyze the current state of conservation of meadow vegetation of the Forest and Forest-Steppe zones of Ukraine (FFSZU) in situ and ex situ and to propose strategic directions for its optimization.

It is noted that as of 01/01/2013 in FFSZU are 23 national parks, eight natural reserves and 19 regional landscape parks. In most these sites meadow vegetation represented different degrees. Rare meadow plants are protected also within a number of reserves of national and local importance as the botanical as well as other types. However, many populations of rare meadow species and valuable plots of natural meadows are still out protection. Moreover, a lack of appropriate management of grasslands in protected areas often leads to the replacement of grassland s by trees and shrubs in the course of natural succession.

It was determined that according to the "Catalogue of rare plants the botanical gardens and dendroparks of Ukraine" (2011), these the botanical institutions cultivated 66.1% of the meadow species included in the current edition of the Red Data Book of Ukraine (2009).

Based on the research were highlighted the strategic direction of optimization of meadow vegetation of Ukraine in modern terms.

DISTRIBUTION AND MOLECULAR DIVERSITY OF *Fontogammarus dalmatinus* S. KARAMAN 1931 ENDEMIC TO THE DINARIC KARST.

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Distribution of the endemic *Fontogammarus dalmatinus* was studied in Croatia. Sampling was conducted at 480 sites across the country. One location for the subspecies *F. d. krkensis* and two for *F. d. dalmatinus* were used for molecular studies based upon two mitochondrial markers (16S and COI). The subspecies *F. d. krkensis* was recorded exclusively in spring habitats and in the upper parts of the Krka River Basin, while *F. d. dalmatinus* was recorded in upper and middle section of the River Zrmanja and its tributaries as well as in the upper part of the River Una. Distribution of the two subspecies proves the known fact that the upper sections of Zrmanja and Krka Rivers were connected in the past prior to ca. 40 kya when paleo-Zrmanja changed its course towards the west. However, finding of the species in the Una River is astonishing as this river belongs to the Black Sea Drainage Area, while the former two are in Adriatic Sea catchment. Molecular study revealed a substantial level of

diversity between populations from all the three rivers. The Kimura 2-parameter distances (ca. 0.1) are of the level observed already for other species well defined in morphological terms. Thus the two formerly defined subspecies should be upgraded to a species level, and the population from the Una River should be described as another species. Moreover, phylogenetic analysis (Maksmum Likelihood) revealed that Fontogammarus lineage is nested witihin Gammarus balcanicus species group suggesting a redefinition of the genus Gammarus.

TWENTIETH ANNIVERSARY OF *Dikerogammarus villosus* IN WESTERN EUROPE - PHYLOGEOGRAPHY OF THE INVADER

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The killer shrimp, *Dikerogammarus villosus*, has been recognised as one of the 100 worst alien species in Europe, representing a major issue for local biodiversity and ecosystem functioning. During the last 20 years, it has colonised Central and Western Europe via the central and southern invasion corridors. Its spread was associated mainly with commercial shipping in large waterways but it was also transported overland to several Alpine lakes and even overseas to the British Isles. Through molecular studies we aimed to understand the dynamics of the species invasion in Europe. Our material consisted of about 500 individuals from its entire European range, sequenced for 16S and COI mitochondrial markers and about 1400 individuals sequenced for seven microsatellite loci each. In result, four major populations in Danube, Dnieper, Dniester mouth and also Durngol Liman in Turkey were identified in the species native area. Two of them, from Dnieper and Danube mouth, were donors for independent routes of invasion along central and southern corridor. Microsatellite data allow to indicate Western Europe populations as a origin of latest introduction of *Dikerogammarus villosus* to UK. Strong bottleneck effects may be seen in the populations from the isolated Alpine Lakes, showing that they come from a very low number of introduced individuals (showing high risk of overland transport). Such complex knowledge on the phylogeography of the killer shrimp may help to decrease risk of its future introductions to other areas, such as the North American Great Lakes and Balkan lakes.

FRESHWATER GAMMARIDS IN MOLDOVA

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Moldova remains one of the least known European countries with respect to its gammarid fauna. The most recent publication, already more than 20 years old, was focused upon Dniester river and its direct affluents. Almost nothing is known about species occurring in smaller rivers and streams. We update the data upon species composition and distribution of

gammarids in Moldova, based on the literature data and material collected during a weeklong expedition in August 2012. During the trip, gammarids were found in 25 localities all over the country. Interestingly, all the sampled small rivers, streams and springs were inhabited exclusively by *Gammarus kischineffensis*. The only exception was river Raut – the direct tributary of Dniester river, where *Dikerogammarus haemobaphes* and *Pontogammarus robustoides* were found. The artificial dam lakes were occupied by *P. robustoides* and *Obesogammarus crassus*.

Pulsatilla halleri (All.) Willd. AND *Viola schariensis* Erben, NEW SPECIES FOR THE FLORA OF KOSOVO

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In this paper, *Pulsatilla halleri* (All.) Willd. and *Viola schariensis* Erben are recorded for the first time in Kosovo. Both species were collected in the mountains of Koritnik, Vraca and Kallabak, located along the border of Kosovo, Albania and FYR of Macedonia. These species inhabit different habitat types in the calcareous and silicate substrates. For the identification, the new species have been compared with their closest relatives in the Balkans. In addition, morphological and taxonomic data for both species and illustrations of the entire plants are given. Finally, their distribution in Kosovo and neighboring countries is mapped, too.

ESTIMATING THE IMPACT OF DITCHES' PRESENCE ON THE DIVERSITY OF FOREST FLORA

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Many environmentalists draw attention to the role of variety of habitats in shaping the diversity of forest flora. Even small-scale disturbances such as natural gaps in canopy and hollows in ground caused by dying trees are important. These natural variations disappear as a result of forest management while anthropogenic structures, for instance roads and ditches, appear more often in forest complexes. This study analyzes an impact of drainage ditches, roadside ditches and old war trenches on increasing of flora's diversity.

We propose a simple method of data comparison between the forest area including a ditch with the forest area without such structure. The Habitat Heterogeneity Index developed by us enables analysis of such areas due to the values of different diversity indexes. We estimated that on average the presence of drainage ditches in the surveyed areas of forest phytocenoses in central Poland had increased values of such indexes as species richness of about 33%, Shannon's 19 %, evenness 5%, floristic value 38 %, floristic uniqueness 8 %. For roadside ditches these values were also increased respectively: 45%, 27%, 9%, 51%, 11%. The presence of war trenches had little impact at floristic diversity.

THE HERPETOFAUNA OF KRNOVO (MONTENEGRO)

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In Krnovo area we recorded 3 species of amphibians (*Mesotriton alpestris*, *Bombina variegata*, *Bufo bufo*) and 9 species of reptiles (*Lacerta agilis*, *Lacerta viridis*, *Podarcis muralis*, *Dinarolacerta mosorensis*, *Natrix natrix*, *Natrix tessellata*, *Coronella austriaca, Zamenis longissimus*, *Vipera ammodytes*) in 8 localities.

PRELIMINARY DATA ON FLORISTIC RICHNESS OF SPECIES WITH ECONOMICAL VALUES IN TOMORRI NATIONAL PARK

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Tomorri National Park is one of the most interesting natural areas situated in south Albania but also listed as a less studied one. Species diversity is investigated in 5 years period in 7 different itineraries geografically spread in the park area. Results so far indicate that there is a rich flora with economical values, 169 species, which represents 21% of the total flora of the park so far; 53 families and 138 genuses. The life forms spectrum indicates that there are 67 H which make the larger life form in the area, meanwhile the corotype spectrum indicates that most of the species are originated from EuAz with around 12%.

Medical plants represents the majour group with 93 species. 99 species are represented in more than one plant group. Maximum economical value plant diversity within the family has been observed in the Fabaceae with 21 species.

EXTENSION OF THE NATIONAL PARK "SHARRI" BOUNDARIES, SIGNIFICANT ACTION FOR PRESERVATION OF NATURAL VALUE

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In the territory of Kosovo are located very important and characteristic mountain`s such are: Bjeshkët e Nemuna, Sharri Mountain, Koritnik, Pashtrik, Mokna Mountains, Kopaonik, etc. Sharri and Koritnik Mountains are characterized with high diversity of flora, fauna, landscapes, high degree of plant endemic's, extraordinary geomorphology, making them important biodiversity centres in the Balkan Peninsula.

Because of its biodiversity richness and other natural values, a part of Sharri Mountains was declared a National Park in year 1986 within an area of 39,000 ha. With this declaration, parts of Sharri and Koritnik Mountains, characterized by high biodiversity and natural values were left outside the protected area.

For this reason, considering previous scientific records of different local and international scientists, group of experts implemented research about the state of flora, fauna and vegetation in this area during 2009-2012. This work resulted in the proposal for extension of the boundaries of the national park Sharri for another 23.469 ha. Considering this scientific proposal by experts, in December 2012 Assembly of Kosovo adopted the Law on the National Park "Sharri", which covers an area of 53.469 ha, that lies in the territory of five municipalities: Kaçanik, Shtërpcë, Suharekë, Prizren and Dragash.

ECOLOGICAL ASSESSMENT RUDERAL COMMUNITIES ANNUAL CEREALS KYIV REGION (UKRAINE).

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Plant type C4 photosynthesis, by some of anatomical and biochemical features, compared to C3 plants type, characterized by high productiveness in the warm and sunny and dry conditions. In anthropogenically transformed habitats under the influence specific ecological factors occurs replacing some by other plant communities. So, in Kyiv region often vegetation cover formed by ruderal communities of annual cereals (Poa annua, Eragrostis minor, E. albensis, E. pillosa, E. suaveolens, Hordeum murinum, Bromus tectorum, B. mollis L., Digitaria ischaemum, D. sanguinalis, Setaria viridis, S. glauca and other) with high projective cover, which sometimes occupy large areas. Most of these species is characterized by C4 photosynthesis. The work communities fixed distribution of annual cereals by gradient edaphic factors such as humidity, salt regime, the contents of nitrogen in the soil. This explains their restriction to well-lit after demutation habitates with light, sandy, low organic matter soils. These plant communities are often the succession stages each other or communities relation to any other syntaxons and masse distributed to other areas occupying large areas of degraded habitat substrates. For investigated region has been developed syntaxomic scheme of vegetation.

CONTRIBUTION TO THE KNOWLEDGE OF THE HOVERFLIES (DIPTERA, SYRPHIDAE) OF MONTENEGRO

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The paper presents the results of investigations on the fauna of hoverflies from the Morača canyon. A total number of 73 species belonging to 29 genera are registered. Seven species are recorded for the first time in the fauna of Montenegro. Also, two species with narow

known distribution are registred: *Cheilosia balkana* (endemic species of Alpine and Dinaric mountains) and *Merodon recurvus* (endemic species of Balkan Peninsula and Carpathians).

The review of registred species, their recent distribution, ecological caracteristics and zoogeographical composition are given, as well as analysis of present larval types.

ABOUT THE CONSERVATION OF THE RARE VASCULAR PLANTS WITHIN THE "HOT SPOTS" IN THE HIGH MOUNTAINS OF THE UKRAINIAN CARPATHIANS

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According to the concise analysis of the modern state of the rare (mainly endangered) species of the Vascular Plants within the high-mountain flora of the Ukrainian Carpathians which was published in the "Red Book of Ukraine" (2009), for many of them we noted the small size of the populations, not complete age spectra, low ability of seed reproduction, low indeces of renewal and replacing. Moreover, the such rare high-mountain species frequently occur in the same communities which are mainly the rare, endemic or relict ones. If these communities include 5-10 (sometimes 15 to 20) rare species, they are regarded as the "hot spots". According to our data, there are ca. 20 "hot spots" close to summits of the Svidovets (Dragobrat, Bliznitsa, Gerishaska), Chernogora (Petros, Shpitsy, Rebra, Turkul), Marmarosh (Pip Ivan), Gorgany (Negrovets) and Chyvchyn (Chornyi Dil, Gnetesa, Lustun) mountain massifs. The all "hot spots" are the important sectors of the of the preservation of the plant diversity within the Ukrainian Carpathians (and evidently in the other Regions of Europe), therefore, they have to be revealed and conserved *in situ*. Meanwile, we began to implement comparative study of the rare species in the experimental plots (*ex situ*) for their subsequent introduction into the natural biotopes. According to our preliminary data, more than 20 forementioned endangered species are common to the high-mountain floras of the Carpathians and Balkans, and most of them also have to be objects of the comparative study in details.

THE EFFECT OF SOCIO-ECONOMIC FACTORS AND LAND CHARACTERISTICS ON ADOPTION OF RESOURCE CONSERVING AGRICULTURAL TECHNOLOGIES: CASE STUDY OF AL-PRESPA PARK

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It is known that the farmer's willingness to adopt resource conserving agricultural technologies is likely to depend upon a wide range of economic and social factors, and land characteristics. This study is primarily focused on econometrically investigating farmers' resource conservation technology adoption decisions given their socio-economic and institutional settings. Using the survey data from AL-Prespa, a logit model is estimated employing the procedure of maximum likelihood to determine the characteristics associated

with adoption of environmentally focused technologies. Information about personal characteristics of the farm household head, the knowledge of resource conserving agricultural technologies, the resource endowment of farmers, farm management practices, cropping patterns, crop yield, role of different institutions to improve farming, and adoption of improved and indigenous resource conserving agricultural technologies, were collected through individual interviews by using a structured questionnaire. Empirical taken results suggest that the likelihood estimates of the resource conserving agricultural technologies appear to work well for the AL-Prespa model application. The findings suggest that while government financial assistance to farmers, the level of farmer education, farmers' income, and farm size has a significant positive effect on the marginal probability of technology adoption. On the other hand, tenure insecurity (measured by land rent) and age of farmer have significant negative effects on the adoption. Availability of credit to farmers, off-farm employment opportunities, and perception of the resource degradation problem has a positive influence on the probability of adoption, however, their magnitude was not found to be statistically significant. The findings could represent the regional perspective of adoption of environmentally focused technologies in agriculture, with a certain level of adjustment.

THE RED LIST OF THE FLORA, THE FAUNA AND FUNGI IN THE FEDERATION OF BOSNIA AND HERZEGOVINA

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Bosnia and Herzegovina is distinguished by high diversity which is under a very serious *threat* caused by various human activities. In order to asses the threat status of species the IUCN criteria version 3.1. have been used. The results of assessment have shown that on the Red List of the Fauna in the Federation of Bosnia and Herzegovina should be included 27 mammal, 40 bird, six reptile, four amphibian and 36 fish taxa. It is estimated thta in the country occurs some 5200 vascular plant species. Taking into acount number of species and a relativelly small country size, Bosnia and Herzegovina is one of the richest countries in Europe. The results of investigation have shown that the Red List of the Flora includes 659 taxa. The highest number (26%) belong to the category vulnerable, while for the large number of taxa (24%) it will be necessary to acquire additional data before definition of their status. The fungi are also poorly investigated. The results have shown that 86 taxa is included on The Red List of the Fungi.

Large number of taxa on the Red Lists stress the need for urgent conservation and protection of species and their habitats.

FLORA OF NASEOBINA HRVAĆANI (PRNJAVOR, NW BOSNIA AND HERZEGOVINA): ECOLOGICAL AND PHYTOGEOGRAPHICAL ANALYSIS

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Floristic research of the village Naseobina Hrvaćani and its surroundings was conducted during vegetation season 2012. Naseobina Hrvaćani is situated in NW Bosnia and Herzegovina, near Prnjavor and biogeographically is placed in contact zone of Illyrian province and the Pannonian province of central European sector. In the investigated area a total of 209 taxa of vascular plant belonging to 60 families were recorded. Division Pteridophyta represented 2.4% of the total flora and division Spermatophyta 97.6%. Among Spermatophyta, Gymnospermae was represented with 5 taxa (2.4%), while Dicotyledones were the most numerous (8.37%) in comparison to the Monocotyledones (11.5%). Families with highest number of taxa were Compositae (10%), Leguminosae (9.6%) and Labiatae (7.2%). Phytogeographical analysis showed that Sub-Central European floral element was the most dominant (23.35%), followed by Eurasian (14.7%) and Sub-Eurasian (9.6%). The most common life forms were hemicryptophytes (45.9%) and geophytes (20.6%). In the investigated area were recorded 12 adventive and 3 threatened taxa.

FLORISTIC DIVERSITY OF DUGO POLJE (MODRIČA, NW BOSNIA AND HERZEGOVINA)

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Dugo Polje is situated in NW Bosnia and Herzegovina nearby Modriča. This area was floristically investigated during vegetation season 2012. A total number of 162 vascular plant taxa were collected and systematically arranged into 129 genera and 53 families. Division Pteridophyta is represented with one species and others were Spermatophyta (99.4%). Dicotyledones (86.4%) were the most numerous within Spermatophyta and Monocotyledones were represented with 21 taxa (13%). The most numerous in species and subspecies were families: Leguminosae (9.9%), Compositae (9.3%), Labiatae (8%) and Gramineae (8). The most dominant floral element was the Sub-Central European (25.5%). Other well represented floral elements were Eurasian with 35 taxa (22.9%) and Sub-Eurasian with 20 taxa (13.1%). The life forms spectrum showed that dominant life form were hemicryptophytes (36.4%) and geophytes (20.4%). Among the whole flora one taxon is listed in "The List of plant taxa for Red Book of Flora of Bosnia and Herzegovina". Adventive plants were represented with 9 taxa (5.6%).

MICROPROPAGATION AND SLOW GROWTH *IN VITRO* CONSERVATION OF *P. avium* L. AND *P. mahaleb* L. GERMPLASM

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The present study was carried out to to find out a micropropagation and a medium-term *in vitro* preservation protocol for *P. avium* and *P. mahaleb*. Wild relatives of cultivated fruit trees represent a source of genetic variability and can be very important in breeding programs and cultivation. Otherwise, i*n vitro* conservation of plant genetic resources has become a complementary approach to the conventional conservation methods. For micropropagation were tested MS, LP and WPM media, each of them combined with 0.3 mg l^{-1} BAP; 0.1 mg l^{-1} IBA; 0.3 mg l^{-1} GA_3, from which MS media gave best results. The rooting percentages of plantlets ranged from 10 to 90%, depending on NAA concentration in the rooting media. Effect of reduced sucrose and MS salts concentrations, elimination of PGRs from nutrient media and combination of low temperature and light regime were examined using *in vitro* grown plant cultures. Maintenance in these conditions reduced microcuttings growth. The effect of low temperature (4°C) combined with reduced light regime is the most effective method of medium term preservation for both species.

SUINES MIGRATIONS ON ROMANIA`TERRITORY DURING THE NEOLITHIC

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The paper presents some archaeozoologic and archaegenetics data about the suines (Sus domesticus and Sus scrofa) during the Neolithic. For the Neolithic settlements the high number of domestic pig remains emphasizes the sedentarity of these human communities. The frequency analysis for the pig remains show the fact that in the Early Neolithic time pig has a very small prevalence, which suggests the high mobility of these communities due to the need of providing food for cattle, goats and sheep. Towards the Chalcolithic, the number of pig remains begins to rise, which suggests a higher sedentarity for the communities of this period. Along the Neolithic the percentage of cattle decreases in the detriment of the other species, out of which the pig face the most obvious rise in percentage. Thus, while in the beginnings of the Neolithic the pig is sometimes absent or in low percentage (below 5% as number of identified remains), towards the end of this period will reach sometimes even 20-25%.

The wild boar is a frequent species among the Neolithic samples. Ecologically, it is considered a forest animal, but it can be found in the grasslands, cane or the islets from the Danube Delta.

The evolution of swine breeding on Romanian territory, with the percentage difference between the number of domesticated individuals in the Early Neolithic compared to the Late Neolithic, is further explained by the genetic analysis. The studies we carried out on the mitochondrial DNA revealed for the Early Neolithic only the existence of the Near-Eastern haplotype ANC-Y1-6A among the domestic pigs in the Eastern Romania, which is

consistent with the idea that in the early stages of farming in this geographical area, pigs were imported from the Near East. In the Late Neolithic, when the farming develops and the number of pigs rises, these will present a higher variety of haplotypes. Apart from the ANC-Y1-6A Near-Eastern haplotype, appears another previously described haplotype, also with a Near-Eastern origin, the ANC-Y2-5A, together with both European haplotypes ANC-A and ANC-C. In many archaeological sites the number of the ANC-Y1-6A Near-Eastern haplotype is still dominant and the occurrence of the ANC-Cside European haplotype in pigs could only prove the introgression of the European wild boar in the domestic stock of Near-Eastern origin. For a better understanding of trade directions and farming development in the Neolithic on Romanian territory, further analysis on more samples is required for the ANC-Y2-5A Near-Eastern haplotype, identified in few samples of both wild and domestic pigs, as well as for the second ANC-Aside European haplotype, identified in Romanian pigs, but absent in the wild boars from the same period of time and geographical area.

This work was supported by Romanian grant CNCS, PN-II-RU-TE-2011-3-0146.

MOLECULAR (RAPD) IDENTIFICATION OF THE FOUR SPECIES OF THE GENUS BARBUS IN LAKES AND RIVERS IN R. MACEDONIA

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RAPD method has been used to analyze a total of 76 fish individuals collected from different localities in Republic of Macedonia. The following were encompassed: River Strumica, River Vardar and his tributaries and two natural lakes-Ohrid Lake and Prespa Lake. Samples affiliated with the four previously mentioned barbel species on the territory of Republic of Macedonia: *Barbus cyclolepis* Kar., *Barbus prespensis* Kar., *Barbus macedonicus* Kar. and *Barbus peloponnesius* Val. Ten random primers were employed to generate RAPD markers. Various RAPD profiles were observed for the different species.

CONSIDERATION AND NEW DATA ON SCARABIDAE FAMILY (INSECTA COLEOPTERA) IN NORD ALBANIA REGION

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The study of Scarabidae family is of great importance not only for the enrichment of systematical data of Albanian Coleopterofauna, but also for the role that individuals of this family play in food chain and in biological war.

Up to now in the world are known 15.000 species and only 74 referred for in Albania. We met 42 of them in Northern Albania, from which 6(six) species are reported for the first time in Albania (*Geotrupes mutator, Ontophagus citellorum, Phylognatus excavates, Hoplia parvula, Trichius zonatus, Potasia lugubris*).

In this paper we present the diversity of species of Scarabidae Family in Northern Albania. In this study we classified these species that belong to 23 different genera.

RARE SPECIES IN ICHTHYOLOGICAL COLLECTION OF NATURAL HISTORY MUSEUM SPLIT

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Ichthyological collection of Natural history museum Split is mostly regional. Some of specimens are over hundred years old.

Total of 152 different species is represented in ichthyological collection of Natural history museum Split. Two species are considered regionally extinct, three are critically endangered, nine are considered endangered and nine are considered vulnerable. In the collection there are four species that are first specimens cought and recorded for the Adriatic sea. Most of those specimens are benthic deep-sea fish. Informations for those deep sea species are data deficient.

ANALYSIS OF SOME FAMILYS FROM CARL STUDNICZKA'S HERBARIUM (IV)

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We analysed some familys: *Campanulaceae, Cactaceae* and *Haloragaceae* (orders: Campanulaceen, Cacteen and Halorageen) with total of 121 herbarium sheets (with 330 samples of herbal plants). According to the labels, the majority of herborized material was collected in the area of Austria (21 sheets). According to the affiliation to a particular herbarium collection in analysed familys or their parts the most represented is Flora Dalmatiens with 23 herbarium sheets. In reference to the part of Studniczka's herbarium which has already been analysed, there are three collection which are mentioned for the first time. Most of the samples of herbarium plants were collected by Studniczka himself (61 herbarium sheets), while others were sent to him by: Borbás, Freyn, Eggert, Halácsy, Brandmayer, Gandoger, Groves, Kumlien and others collectors.

The oldest herbarium samples dates from 1867, where as the newest ones date from 1902. The vast majority of herbarized material (herbarium sheets 74), was collected during the period from 1871 to 1880.

According to Studniczka, within 121 herbarium sheets (orders Campanulaceen, Cacteen and Halorageen) there are 15 genera with 76 species, and 20 varieties.

REVIEW OF CAVE BEETLE FAUNA OF DR. EDUARD KARAMAN'S ENTOMOLOGY COLLECTION OF NATURAL HISTORY MUSEUM, SPLIT

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Dr. Eduard Karaman (Split, 1849-1923) was a pioneer of entomology in Dalmatia. He has worked with many entomologists of that time, such as Ganglbauer, Reitter, Winkler, G. Müller, I. Novak and others. Karaman left his entire collection, about 30,000 specimens, to the city of Split, which is part of natural history museum since the beginning. The first and currently the only review and systematization of collection, was made by Peter Novak at 1952, by following the latest catalog of beetles (Winkler, 1924 – 1932). After 60 years, 2011 a project of the new revision has been started and it is still ongoing.

The collection contains five families of beetles that represent underground fauna, a total of about 550 specimens. Specimens were collected from the area of Dalmatia and other parts of Europe (Slovenia, Bosnia and Herzegovina, Austria, Montenegro...). Majority of copies have two labels. First label denotes the name of collector, date and location and second inventory sub label number. According to the labels, most specimens are collected by Karaman himself.

AMPHIBIANS IN HERPETOLOGICAL COLLECTION OF NATURAL HISTORY MUSEUM SPLIT

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Analysis of the herpetological collection of Natural History Museum in Split found that amphibians were represented in the herpetological collection by 30 inventory numbers with 46 samples. In the herpetological collection there are samples of 2 orders, 6 families, 7 genus and 11 amphiban species. The most represented samples are from Salamandridae family, infact genders *Triturus* and *Salamandra*. The largest number of samples were collected by Girometta U. and Cvitanić A. collecting at the area od Dalmatia. A large part of the collection doesn't contain information of collector or collection date. The collection was created in period of 20-ies of XX. century to the end of 2012. year.

NEOLENTINUS SCHAEFFERI (GLEOPHYLLACEAE) IN MONTENEGRO

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Neolentinus schaefferi is widespread in Europe but it is certainly rare - it has been red-listed in several countries including Croatia, the Czech Republic, Slovakia, Switzerland and Poland. This species is recorded for the first time for the territory of Montenegro in a typical floodplain forests with *Quercus robur, Fraxinus angustifolia* and *Populus alba* in the area of Ulcinj. Its detailed description, distribution and a colour photograph are given. Also, in this paper the assessment of threats of *N. schaefferii* in Montenegro according the IUCN categories and criteria is given.

SOME FLORISTIC AND CHOROLOGICAL CONTRIBUTION TO THE VASCULAR FLORA OF MONTENEGRO

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During the floristic survey at Long Ulcinj Beach and its hinterland several interesting floristic and chorological data were recorded: i) one new species for the native flora of Montenegro *Juncus pygmeus* ii) one new species for the alien flora of Montenegro *Poncirus trifolata*, and iii) two new populations of very rare species *Succisella inflexa* and *Bellardia trixago*. Both of these rare species were known for only one locality, but considering the fact that literature source about presence of *Succisella inflexa* date from 1890, it was doubtful if this species still exists in our flora. For each species details about habitat type, population size, distribution in the hinterland of Long Ulcinj Beach, general distribution/ origin are given.

Ecology of populations and communities

BREEDING BEHAVIOUR OF SOME CICONIIFORMES SPECIES IN THE LOWER PRUT RIVER BASIN (REPUBLIC OF MOLDOVA)

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This article presents results of our fieldworks carried out on breeding Ciconiiformes species within mixed or monospecific colonies. The study covers the period 2006-2012 and was done on some lakes from the Lower Prut sector, representing the Ramsar site in R. Moldova – Manta Lake, Iezer Lake (Colibasi) and scientific natural reserve "Lower Prut". These lakes have connections with the Prut River, comprising open waters, floodplains and swampy areas and channels.

In the scientific reserve "Lower Prut", the aquatic and swamp habitats are predominantly composed of willow, poplar and crack willow, so, the colonies of Ciconiiformes species are placed vertically and mixed. The suitable nesting habitat is reduced, making held the nest natural setting, but also gives a very good coexistence of inhabiting species from the area.

Mixed colony consists of the species *Ardea alba*, *Ardea cinerea*, *Phalacrocorax carbo*, occupying the central area of colony, but also the species *Plegadis falcinellus*, *Platalea leucorodia* and *Egretta garzetta*, present in the peripheries of the colony.

On the Manta Lake and Iezer Lake (Colibasi), the compact reed beds prevails, so, the Ciconiiformes species, especially the egrets, spoonbills, glossy ibises and herons form large mixed colonies, placed horizontally. We mention that in all studied associations, the species *Platalea leucorodia, Ardeola ralloides* are subdominant in installing nest within a colony or associations, while the *Ardea alba* is the dominant species, being usually found at the top or in the middle part of colony, where the safety of clutch and offspring increases.

CHANGES IN THE STRUCTURE OF MACROZOOBENTHOS COMMUNITY UNDER THE INFLUENCE OF INVASIVE SPECIES (BLACK SEA, SEVASTOPOL BAY)

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Studied the annual dynamics (2001-2008) of macrozoobenthos community structure in the contact zone of the river-sea (Sevastopol Bay). Found 5 of invasive species. The most abundant was bristle worm *Streblospio ginobranchiata*, first recorded in 2007. In 2008, the abundance and frequency of occurrence of this species increased. He took the leading position in the community in abundance. Under the influence of *S. gynobranchiata* has been a change in the structure of benthic communities in the inner part of the Sevastopol bay that affected a group of dominant species. At the time of occurrence in the Sevastopol Bay of *S. gynobranchiata* in 2007 there was a sharp decline in the diversity community, then, in 2008, community diversity increased somewhat, but did not reach the initial level. The trophic structure of the community has also changed. There has been a decrease in the number of native species that occupy similar ecological niche to the invasive species.

The presented results were obtained with the partial financial support of the EC 7th FP project «In situ monitorihg of oxygen depletion in hypoxic ecosystems of coastal and open seas, and land-locked water bodies» (HYPO, # X 226213)

ZOOBENTHOS OF THE VRBAS RIVER RIGHT BANK BELOW TIJESNO IN THE ZONE OF WATER LEVEL OSCILLATIONS

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Along the river Vrbas several hydro power plants have been built and their operation affects the oscillations of the water level downstream. The aim of this paper is to determine the composition and seasonal monitoring of the state of zoobenthos of Vrbas in the zone of water level oscillations. Zoobenthos samples were collected using a Surber net in summer 2009 and autumn 2011 on the right side of midstream of the Vrbas river downstream of Tijesno, in three segments of longitudinal profiles (fast, moderate and diffused flow) with three points on each transversal profile of each segment (bank, 3 m and 6 m). A greater number of taxa have been found in the summer compared to the autumn, in all segments. The Chironomidae larvae were the dominant taxon in most points, all three segments and in both seasons. Their position on the bank of the diffused flow is replaced by Oligochaeta in the autumn. Density of the Mollusca settlements decreases while moving away from the bank, indicating their greater tolerance to changes in water level of Vrbas, in contrast to Annelida and Arthropoda, whose number of individuals rises in the same profile.

SPATIAL VARIABILITY IN TIME IN HYBRID ZONE OF TWO LAND SNAIL SPECIES

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The changes of qualitative and quantitative characters in zone of introgressive hybridization of land snails *Brephulopsis cylindrica* and *B.bidens* were traced at a period from 1991 to 2009. The manifestation of bimodal distribution of qualitative characters was marked in 1996, which is probably due to the gradual elimination of hybrid individuals. As for quantitative characters the bimodality was noted only in 2003. However the variability for both groups of characters becomes by more or less unimodal mode by 2009. This may concerned with the increasing of the average temperature in the summer months observed in the region at a period from 2005 to 2009.

It is our opinion that these data support the view on the reduced productivity of interspecific hybrids. However, in case of any changes in environmental factors (for example increasing of temperature) the hybrids may prove to be more viable. In case if such factor changes will be of a periodic nature the pattern of variation in the hybrid zone will also demonstrated periodic changes. On the other hand, if environmental factors will have the

unidirectional trend in a long period of time, the elimination of the parent species might show. In this case the hybridization can be a leading factor in microevolution and speciation.

DOES A RECENT CHANGE IN THE NORTHERN ADRIATIC HYDROMEDUSAN FAUNA INDICATE THE POSSIBILITY OF SPECIES REPOPULATING?

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During the last 50 years ecological changes were already noted in the northern Adriatic, and many species disappeared from this zone. Following concern about substantial changes in the northern Adriatic, in this study we present the comparative results of the composition and abundance of hydromedusan fauna of northern Adriatic, pointing to the possibility of species repopulating recent years. Presented data are results of investigations during three study periods: the first from 1999-2002, second from 2003-2007 and the third from 2009-2011. Our results clearly showed that the number of species and their abundance increase from the first to the third investigated period. We assume that some species were introduced by input currents in the northern Adriatic, which is confirmed by the increasing density of trachymedusa, but abundances of some species were several times higher than in previous records. Although the abundance of hydrozoan species vary during their life cycles, our high mean and maximum values of this metagenetic specimens could indicate the possibility of establishing stable populations in the area. These changes are consistent with the recent changes in the plankton composition and abundance, probably caused by a climatic forcing and recognized oligotrophication of the entire northern Adriatic.

MESOZOOPLANKTON DYNAMICS IN A STRATIFIED SEMI-ENCLOSED MARINE ENVIRONMENT (VELIKO JEZERO, SOUTH ADRIATIC SEA)

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A yearlong study of the mesozooplankton species composition, abundance and biomass distribution was conducted from February 2008 to February 2009 in the semi-enclosed marine lake Veliko Jezero. The degree of isolation strongly influences the composition of the community. Therefore, zooplankton populations in the lake were characterized by high abundance and a low number of species compared to the neighbouring open Adriatic. A total of 58 mesozooplankton taxa were identified. Copepods were found to be the dominant group over the entire sampling period and accounted for between 19% and 62% of total mesozooplankton density. The most abundant were cyclopoida-oithonids (*Oithona similis* and *O. nana*), and small calanoids *Paracalanus parvus* and *Acartia clausi*. The highest

abundance and biomass were recorded during the summer, while the lowest values were related to the bottom hypoxia during autumn. Increased salinity in the surface during autumn suggests a stronger inflow of open Adriatic waters and coincides with increased biodiversity. Our analyses were based on the data available, indicating strong physical forcing as the primary influence on variation in zooplankton dynamics of the investigated area.

A PROSPECTIVE STUDY OF URINARY TRACT INFECTIONS IN SOME GROUP OF POPULATION IN TIRANA, ALBANIA

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Four hundred pepole were monitored for urinary tract infections (UTIs) in Tirana, Albania. The study included all the patients who were admitted or visited the outpatient departments in the Public Health Directory and had urinary tract infection confirmed by positive urine culture reports. As the ground for planting urine is used blood agar, endo agar, McConkey, etc.. In the present study 103 (25.75%) of the samples were found to have significant bacteriuria and remaining 297 (74.25%) samples were found to have either non significant bacteriuria or very low bacterial count or sterile urine. Out of 103 isolated pathogens the most common isolate was *Escherichia coli* (19%), followed by *Staphylococcus saprophyticus* (1.75%), *Proteus vulgaris* (1.75%), group B *Streptococcus* (1%), *Klebsiella spp.* (0.75%) and *Pseudomonas aeruginosa* (0.50 %). Women are more susceptible to urinary tract infections, especially against *Escherichia coli*, resulting positive in 23% of cases; While *Staphylococcus saprophyticus* has a female percentage of 2%. In this study are presented significant data showing univariante analysis that accompanying leukocyturia with *Eschericia coli* is significant.

MORPHOLOGICAL CHARACTERISTICS OF A POPULATION OF THE FIRE SALAMANDER (*Salamandra salamandra*, Salamandridae) FROM ŠAR PLANINA MOUNTAIN

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The fire salamander, *Salamandra salamandra* (Linnaeus, 1758) is tailed amphibian which inhabits southern and central parts of Europe. In the Balkans, could be found in the highland area, up to 1700 m asl. Here, we present the results of the analysis of morphological characteristics of fire salamander population from Šar planina mountain (Serbia). On the samples taken from eight localities univariant and multivariant statistical analyses have been performed. For 17 morphometric characters basic parameters of descriptive statistics have been calculated, separately by sexes. The analysis of variance (ANOVA) showed that sexes significantly differed in many characters. Males had bigger forelimb length, hindlimb length and forefoot length, but females were larger in head width. Also, percentages of states for threee qualitative traits were presented. Prevails of symmetrical type of pattern of dorsal

blotches. Results are discussed in comparison with the literature data for other populations from the territory of central Balkans and Europe.

ECOPHYSIOLOGICAL DIFFERENCES BETWEEN POIKILOHYDRIC PLANTS *Ramonda serbica* AND *Ramonda nathaliae*

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These species are good examples of ecophysiological divergence regarding the plant water relations and the adaptations to the conditions of water regime in the habitat. Aim of this study was to investigation of different ecological conditions of these species in their habitats and to comparison of photosynthetic activity responses and relative water content (RWC) during dehydration and rehydration cycle. *R. serbica* inhabits in more humid and cooler habitats, primarily sheltered by forest canopy, while *R. nathaliae* is found in more open, drier and warmer habitats. In this case, our results of RWC showed that dehydration of *R. serbica* leaves was very slow, especially in the first stage. On other hand, rehydration was restored rapidly in *R. nathaliae*. Therefore, the preservation of the RWC in *R. serbica* more than in *R. nathaliae*, in first stage of dehydration, could be as a result of these conditions. During dehydration when RWC were more than 40 %, photochemical efficiency of PSII for photochemistry, the Fv/Fm ratio, decreased about 40 % in *R. nathaliae* plants, but a strong reduction with 60 % was recorded for *R. serbica*. Following rehydration, the Fv/Fm ratio recovered more rapidly in *R. nathaliae*. Moreover, the present results suggest that *R. nathaliae* was more resistant during desiccation than *R. serbica*, and recovered more rapidly to normal physiological activity after rewatering.

RESPONSE OF CELL CULTURE OF *Chlamydomonas actinochloris* ON RE-EXPOSURE TO MICROWAVES

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The effect of microwave treatment on the development of a population of cells of *Chlamydomonas actinochloris* in lag phase in a liquid medium was investigated. Irradiation was carried out at different doses and then monitoring of culture within a few weeks was conducted. At the same time the number of cells and their functional status was controlled by fluorescent measurements of suspensions. It is shown that a single dose of irradiation at less than 80 J/g has little effect on cell growth. Whereas after a dose of 100 J/g the functional state of cell culture deteriorates and cells numbers decrease. However, the negative effects of radiation in a few days come to naught and finally the number and functional status of the

irradiated culture is higher than the control one as a result of renovation of the population by descendants of the most viable cells.

Two years after the experiment the treated culture was again irradiated at the same dose. It is shown that repeated exposure make worse the functional state of culture. It is become apparent in the termination of its development at an early stage of the experiment.

NEW DATA ON SPECIES DIVERSITY OF TARDIGRADES OF THE BLACK SEA

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New data on the marine tardigrades were obtained during the investigation of meiobenthos of different areas of the Black Sea: the coastal zone of Crimea, the northwestern part of the Ukrainian shelf and the Bosporus area.

For the first time new for the coastal zone of the Black sea species of tardigrades *B. gilmartini* McGinty, *B. spinicauda* Gallo D'addabbo, Sandulli, De Zio Grimaldi, *Florarctus hulingsi* Renaud-Mornant, *Styraconyx qivitoq* Kristensen, Higgins, *S. nanoqsunguak* Kristensen, Higgins, *Wingstrandarctus corallinus* Kristensen, *Megastygarctides orbiculatus* McKirdy, Schmidt, McGinty-Bayly, and *Megastygarctides* sp. n., were recorded.

Deep-sea tardigrades *Dipodarctus subterraneus* Renaud-Debyser, and *Tanarctus ramazzottii* Renaud-Mornant, were found in the Bosporus region and near Kerch Peninsula.

For the first time data on the distribution, abundance, diversity and vertical distribution in bottom sediments of tardigrades species of the Black Sea were obtained and analyzed. At first, the role of tardigrades in the benthos community of Crimean coast was evaluated.

According to our data, fauna of tardigrades increased to 19 species, 14 of which are new records for the Black Sea, and 1 according to preliminary data, new for science.

A part of this work was supported from EC 7th FP project HYPOX No226213 and PERSEUS EC Project No. 287600.

"SURVEILLANCE OF GASTOENTERITIS OUTBREAKS IN THE POPULATION OF DURRES DISTRICT"

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Gastroenteritis is the most frequent disease all over the world other in the developed countries or in the developing ones. But in the recent years the numbers of gastroenteritis outbreaks has increased significantly. The disease may be caused by various viruses, bacteria, or parasites. Generally, gastrointestinal pathogens are spread directly from one person to another person, via aerosols of vomit, from contact with contaminated surfaces, or by consuming contaminated foods or water. Gastroenteritis outbreaks frequently occur as epidemics which appear to be related to environmental factors. Age, climate, living conditions, hygiene and cultural habits are important factors. Considering what we said above, we undertake such a

study to demonstrate the dynamics of gastroenteritis outbreaks in Durres district during the January to December 2012. The study includes 12340 cases of gastroenteritis in 43% of females and 57% of males. As far as geographic distribution of population is concern 83.8% of cases are isolated in urban areas and 16.2 % of cases in rural areas. Children are at particularly high risk for gastroenteritis and concern 64,8% of cases encountered in this period.

SPECIES DIVERSITY OF THE PELAGIC OSTRACODS FROM THE ARABIAN SEA REGION

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A total of 69 species of pelagic ostracods have been identified from the Arabian Sea region (four of them to the genus status, at least three ones as the new), based on the samples collected within the framework of the Netherlands Indian Ocean Program (NIOP; cruise B2, 1993), the U.S. Joint Global Ocean Flux Study (U.S. JGOFS; cruises TN039, TN043, TN045, TN050, TN054, 1994–1995) and the U.S. Global Ocean Ecosystems Dynamics Program (GLOBEC; cruises MB9503, MB9506, 1995). The most of ostracod species are belonged to the family Halocyprididae (33 genera); three species – to the family Cypridinidae. For the analysis of species diversity the Shannon and Simpson indices were used. The increase in species diversity of ostracods in north-south direction is shown by the example of deep stations (up to 1000 m) during the cruise MB9503, between monsoons, when upwelling along the coast of Oman have minimal influence on the zooplankton distribution. For the bathymetric distribution of ostracods a few species in the upper 0-50 m and the maximum species diversity in depths 100-500 m are typical. The greatest abundance of ostracods and clear dominance of one or more species were observed in the zone of upwelling influence.

THE HEAVY METAL INFLUENCE ON THE HUMAN POPULATION IN KOSOVSKA MITROVICA

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Results that were presented in this paper work came out from the research during May, June and July 2004 on the sample of 58 children in order to investigate the level and the pathways of the exposure of children in Kosovska Mitrovica and Zvecan. These children were from 24 -36 months old.

From the total number of 58 children, 24 of them (60%) did not show increased level of the lead in the blood, meaning 10µg/dL(WHO). All of these children were Serbian nationality. 18 children (32,3%) had lead blood level between 10-19,99 µg/dL, Five of them (1,16%) had concentration from 20-44,9 µg/dL.

Twelve children (4,8%) had concentration from 45 µg/dL and up. All of these children were Roma nationality and we consider that illegal lead smelting in the camp where they live had influenced such high blood level concentrations.

APPLICATION OF DIFFERENT METHODS IN MICROPROPAGATION OF SEVERAL SPECIES OF THE GENUS *AESCULUS*

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In order to improve and/or to preserve endemic, ornamental woody species (OWS), different biological programmes including *in vitro* tissue culture, molecullar genetics and genetic engineering have been employed. Micropropagation (M) *via* androgenesis (AN) by androgenic embryos (AEs), somatic embryogenesis (SE) by somatic embryos (SEs), secondary somatic embryogenesis (SSE) by secondery somatic embryos (SSEs) and genetic transformation (GT) of the OWS play an important role for the production of trees with desirable characters. The results presented here are focused on the micropropagation of *Aesculus hippocastanum, A. flava and A. parviflora via* AN in anther and suspension uninuclear microspores culture by AEs and *via* SSE by SSEs. The SE in immature ovule culture of *A. hippocastanum* by SEs was achieved on MS agar medium with 2,4-dichlorphenoxyacetic acid (2,4-D) and kinetin (Kin), (1mg L^{-1}, each).

Anthers of *Aesculus* spp. were collected from selected trees. They were isolated from closed flower buds of different size (3, 4 and 5 mm. in lenght). Anthers or microspores of A*esculus* species were cultured on MS agar (0.7%), or MS liquid medium containing mineral solution of Murashige and Skoog (1962), 2% sucrose, organic compounds and (in mgL^{-1}): 2,4-D and Kin (1.0, each). The AEs formation of *A. hippocastanum* and *A. flava* in anther culture were formed by direct microspores division. The AEs formation of horse chestnut were efficient only in suspension culture. In anther culture of A. *parviflora,* the AEs were formed *via* androgenic callus. For these species, it is commonly noticed that the effective number of embryogenic and callogenic microspores is very low. Formation of pollen-derived plantlets in anthers culture of *Aesculus* spp. seems to be connected to pollen dimorphism (PD). During the first week, PD of microspores was still visible. After the 3-10 weeks, numerous microspores differentiated into globular, torpedo and SEs with cotyledones of horse chestnut, red chestnut and yellow buckeye. The AEs were separated from anthers and multiplied on MS medium with 2, 4-D and Kin (0.01, 1.0 mg L^{-1}, respectively). Plantlets of *A. hippocastanum* and *A. flava* have haploid chromosome number, but anthers of *A. parviflora* produced haploid androgenic calli. The AEs of all species germinated on MS agar hormone-free medium, or on MS+ Kin +GA_3 (1.0 mg L^{-1}, each). The SSEs appeared on the cotyledones and radiculi of AEs of *Aesculus* spp. Pantlets regeneration of *Aesculus* spp. by the AN, SE and SSE was successfully achieved. The 2,4-D and Kin. were necessary for the induction, while for the further development of AEs, SEs and SSEs different concentration of IAA or IBA and GA_3 were applied. These methods can be used in the GT applicable in the pharmaceutical industry due to the production of secondary metabolites and for protection and conservation of endemic species of the genus *Aesculus*. The micropropagated plants of *Aesculus* spp. will be reintroduced in their natural environment.

GROWTH PARAMETERS IN THREE CYPRINID FISH SPECIES, *Carassius gibelio* (Bloch, 1782), *Blicca bjoerkna* (L. 1758) AND *Abramis brama* (L. 1758) FROM THE TAMIŠ RIVER (VOJVODINA, SERBIA)

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During 2009 and 2010, a complex investigation of the eco-status of the Tamiš River was conducted. Within the ichthyological research, ichthyofauna composition, age, sex, and growth rate of various fish species were observed. The aim of this study was to determine the Von Bertalanffy growth parameters for three cyprinid fish species and thus complement the results obtained in the mentioned study. Ichthyological sample was collected during 2009 and 2010 at Sečanj, Banatski Despotovac and Opovo sites with standard electrofishing device and gill nets of various mesh sizes. The sample included a total of 52 *Carassius gibelio*, 58 *Blicca bjoerkna* and 56 *Abramis brama* individuals. Immediately after the catch, individuals were weighted for body weight (±1 g) and measured for total length (±1 mm). Growth parameters were assessed by fitting the von Bertalanffy growth function to length-at-age data using FiSAT II software. Growth parameters in *Carassius gibelio* were L_∞ = 50.40±14.28 cm, K = 0.2±0.1 year^{-1}, t_0 = -0.74±0.37, in *Blicca bjoerkna* were L_∞ = 34.86±3.75 cm, K = 0.28±0.06 year^{-1}, t_0 = -0.71±0.12, and in *Abramis brama* were L_∞ = 45.67±6.82 cm, K = 0.22±0.08 year^{-1}, t_0 = -0.44±0.38. All growth parameters were in accordance with data presented in FishBase.

PLOIDY ASSESSMENT AND SPECIFIC GROWTH PATTERNS IN THE PRUSSIAN CARP, *Carassius gibelio* (Bloch, 1782) FROM THE BEGEČKA JAMA RESERVOIR (VOJVODINA, SERBIA)

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Prussian carp is one of the most widespread invasive fish species. It is known that it occurs in two biotypes, diploid and triploid. The aim of this study was to determine the ploidy level and specific growth patterns of individuals from the Begečka Jama site. A total of 26 individuals were sampled during May 2013 using standard electrofishing device. Blood was taken from the caudal vein and blood smears were prepared for ploidy assessment. Mean erythrocyte nucleus area of 11.16±0.32 μm^2 indicates that individuals were diploid. For determining specific growth patterns a total of 14 morphometric characteristics were measured, including standard length, snout to dorsal fin base, snout to pectoral fin base, snout to pelvic fin base, dorsal fin, anal fin and head lengths, eye diameter and dorsal fin, pectoral fin, pelvic fin, anal fin, head and body heights. Morphometric characteristics were ln-transformed and growth patterns were calculated according to the equation: lny =a + b*lnSL where y was the measured characteristic, a the intercept and b the growth coefficient. Isometric growth was observed when b=1. T-test was used to test deviations from the isometric growth. Only dorsal fin height and anal fin height showed allometric growth ($p < 0.05$).

TOTAL AREA OF PORES LOCATED ON THE VALVES OF CENTRIC DIATOMS FROM GENUS *Coscinoduscus*

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Unicellular diatom algae constrained in silicon frustule that consists of two valves and cingulum and is perforated by tiny pores. The material exchange between diatom algae and environment occurs through these pores and characteristics of material flow are related to the total area of pores on the surface of diatom frustule. Pores on the valves of centric diatoms are grouped into areolae which are optimally packed and arranged in spiral rows that conform to phyllotaxis law. The mathematical model that simulates pore arrangement is used to calculate the total area of pores located on the valves of centric diatom. The obtained results show that the porosity of valves of some centric diatoms from genus *Coscinodiscus* is about 4-8% and this value is species specific. Such as 100% of valve surface absorbed sunlight it is supposed that the ratio between matter and energy flows through diatom valve surface is about 1:15. It was proposed to use the ratio between the total area of diatom frustule and the total area of pores on its surface for the characteristics of microalgae production.

SOME CHARACTERISTICS OF *Cystoseira* ASSEMBLAGES OF INTERTIDAL FRINGE ON THE COST OF MONTENEGRO

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Canopy-forming macroalgae of the genus *Cystoseira* are habitat formers and climax vegetation on the hard bottom in the Mediterranean Sea, but unfortunately they are also sensitive to a variety of environmental stressors and their loss is reported worldwide. By the EU Water Frame Directive these algae are used in assessment of ecological status, so aim of this study was to provide some characteristics of their assemblages in the intertidal fringe on the cost of Montenegro. Wet biomass on 5 locations wearied between 49 g/m^2 and 5345 g/m^2 for *C. amentacea* var. *stricta* and 39-1268g/m^2 for *C. compressa.* The morphological characteristics of these 2 species were also very variable in space and time and cannot be considered as good indicators if not monitored for a long time or combined with other indicators.

THE VERTICAL DISTRIBUTION OF ABUNDANCE AND BIOMASS OF MOLLUSCA ON ROCKS IN THE AQUATORIUM OF THE KARADAG (CRIMEA, UKRAINE, THE BLACK SEA)

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The vertical distribution (on depths 0 – 12 m) of average abundance and biomass of mollusks in summer 2009 – 2012 years on the biggest rocks (Golden gate, Mayak) in the aquatorium of the Karadag nature reserve was analyzed. We took 23 samples. In the whole, 18 species of

Mollusca, relating to classes: Bivalvia (2 species), Gastropoda (14 species) and Polyplacophora (2 species) were found. Only one species, *Mytilaster lineatus* (Gmelin, 1791), was found on all depths. The maximum of abundance of mollusks on a depth 3 m (almost 17000 ind./m^2) was remarked, mainly to due to *M. lineatus* and highest biomass – on depth 2 m (almost 10 kg/m^2) because of *Mytilus galloprovincialis* Lamarck, 1819 was found. The minimum of abundance of Mollusca on depth 12 m (near 1200 ind./m^2) and biomass on depth 10 m (100 g/m^2) was found. So, the vertical distribution of mollusks on rocks of Karadag is uneven and different species has their peaks of abundance and biomass. However in average the abundance and biomass of it from 0 to 2 – 3 m are increased and from 2 – 3 to 10 – 12 m are decresead. Relatively low abundance and biomass of Mollusca on depth 0 m can be explain of influence of surf, but on depth 10 – 12 m - by the closeness of bottom, and, probably, migrations of Gastropoda from bottom to rocks and back and so decreasing of amount of food for mollusks-phytophags.

BIOECOLOGICAL STUDY ON THE OUTBURST OF DIPLOPODES POPULATIONS (CLASS DIPLOPODA) AROUND THE WATER PUMPING STATION OF KONJAT, LUSHNJE

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For more than ten years, several population outburst of two millipedes species respectively *Anoploiulus apfelbecki* (Verhoef 1898) and *Pachyiulus varius* (Fabricius 1781) are reported in the cultivated plains of Konjat, Lushnja. The terrain typology (soil structure, the water table of the underground waters, etc), as well as the presence of several organic polluting sources are among the primary causes of these outbursts. The estimation of individual number and the biomass in the area around the pumping station shows very high values: from 1.48 ind/l (Apr. 2011) to 3.87 ind/l (Sep. 2011) or 647 ind/m^3 (Apr. 2011) to 1,705 ind/m^3 (Sep. 2011). All lab tests with different pesticides available of the market, such as Cipermetrine, Deltametrine, Willotrine and Kaotrine confirm that the chemical pest control has low efficiency. Considering the strict hygiene and sanitation requirement for such environment, the study suggests a practical solution for the physical and chemical control of the individual number of diplopods migrating towards this pumping station.

PLANKTON COMMUNITY (PHYTOPLANKTON, PROTOZOO- AND ZOOPLANKTON) ARE FORMED IN THE PHYTAL ZONE OF RAIFSKIY LAKES (VOLZHSKO-KAMSKIY STATE NATURAL BIOSPHERIC RESERVE, REPUBLIC OF TATARSTAN, RUSSIAN FEDERATION)

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The study of planktonic organisms, developing in macrophytes communities, caused developing an idea of species diversity of organisms (phyto-, protozoo- and zooplankton) in

lakes (Mukhortova *et al*., 2010; Tarasova *et al.*, 2010). Species diversity of planktonic organisms is considerably higher in the phytal zone, than of the communities developing in the pelagic and littoral lake zones lake due to higher evenness of phytophilous communities. Shannon index is uncommonly high (up to 6 bits / ind.) in the phytal lake zone. The greatest species number of all planktonic community components was found in ecotype of rooted emophyte in all lakes. Specificity of phytophilous communities is confirmed by a low of Sørensen's similarity coefficient, calculated for the plankton community components, developing in pelagic, littoral and phytal lakes zones.

FIMICOLOUS ORGANISMS, INDICATORS OF BIODIVERSITY & GRASSLAND HABITATS: EXAMPLE FROM NATURE PARK BIOKOVO MT.

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Fimicolous (coprophilous) organisms use excrements of ruminants (Ruminantia) and odd-toed ungulates (Perissodactyla) for development of larvae, as a food and/or residency. They are important element of biodiversity with important ecological role, especially in grassland habitats, using very ephemeral substrate; occurrence of some fimicolous organisms is short-lived and occasional. Their disappearance indicate disturbance of the ecosystem, cessation of extensive use of pastures for cattle breeding which, as a rule, results in degradation of grassland sites and their succession, followed by the reduction in number of grassland species, and in the end in disappearance of taxa specific to grasslands. Therefore, fimicolous organisms are very suitable as ecological indicators. The complementary research of fimicolous organisms was performed during 2010-2012 where over 90 fimicolous taxa have been recorded, with some species new to fauna of Mt. Biokovo and Croatia, but also with 4 taxa potentially new to science. In total, 35 species of fimicolous fungi have been detected, 25 of them belong to the phylum Ascomycota, 9 taxa to phylum Basidiomycota, and one to phylum Zygomycota. Coleopterans (Coleoptera) are represented with 59 taxa belong to families: Aphodiidae (13), Geotrupidae (4), Histeridae (6), Hydrophilidae (6), Nitidulidae (2), Scarabaeidae (16) and Staphylinidae (12).

THE INFLUENCE OF THE BOTTOM TOPOGRAPHY AND WATER TEMPERATURE ON THE INTENSITY OF BIOLUMINESCENCE IN THE SEVASTOPOL COASTAL AREA (UKRAINE)

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Such biophysical parameters as bioluminescence intensity, temperature, and salinity were recorded in 2009-2012 in the coastal area of Sevastopol using a towed hydrobiophysical complex "Salpa-M". 12 tows were made in different seasons of the year. It was observed that the variability of bioluminescence and temperature in all seasons depended on the bottom topography (of the ancient river-bed of the Chernaya River). These results are confirmed statistically by one-way ANOVA. However, the mode of distribution of bioluminescence intensity was different in different seasons. It is shown that these changes can be related to seasonal changes in water temperature, particularly with the formation of the seasonal thermocline. The results of one-way ANOVA confirmed this effect of water temperature, with a high reliability. However, in the summer, the relationship between the intensity of bioluminescence with the temperature was negative, while in winter it was positive. Thus, the relief of the sea bed, the water temperature and possible the internal waves which form as a result of the interrelation of the above mentioned factors can significantly affect the marine biophysical fields such as the field of bioluminescence.

SEED HETEROMORPHISM OF *Epipactis helleborine* (L.) Crantz (ORCHIDACEAE, NEOTTIEAE)

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Backgraund We quantified the morphological differences in seed morphological traits between and within different populations of *E. helleborine* and we correlate these variations with local environmental conditions.

Methods Mature seeds (30 per capsules) were taken from live plants from 3 dehisced of capsules from the same individual (n = 30 × 3 × 30). We measured the following morphological and anatomical traits of seed: i) seed length, ii) seed width , iii) seed circuit, iv) seed area, v) embryo length, vi) embryo width, vii) embryo circuit, and viii) embryo area. We also calculated the volume of seeds, volume of embryos and percent of free air space in the test. To document edaphic differences among sites, soil texture and chemistry were analyzed.

Results The statistically significant differences in almost all studied characters were found between the plants from natural habitats and human disturbance habitats.

Conclusion Morphological traits of *E. helleborine* seeds removal varied significantly among populations, but there were no consistent differences among the regions studied. This study of seed trait differences may contribute to our understanding of optimum habitat conditions and the ecophysiological adaptations of plants.

ASSESMENT OF MICROBIOLOGICAL CONTAMINATION LEVEL OF DRINKING WATER FOR LEZHA REGION

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The presence of indicators at a level outside of specified limits may reflect a problem in the treatment process or in the integrity of the distribution system. Testing water for each of these potential pathogens (disease causing agents) would be difficult and expensive. Instead, for water quality and public health it measures coliform total levels. This study is undertaken to evaluate the level of microbial contamination of drinking water for Lezha Region. There is a data collection of the results of the drinking water microbiological analyses for the period of May 2012 – May 2013. Study and analyzing all the data and comparing them in order to see the trend of the pollution level of the drinking water. After microbiologically examination of 891 water drinking samples for this period, and after data analyse it resulted high levels of microbial contamination of drinking water for Lezha Region, MPN = 16, and for a considerable number of samples as 18.57 % of water samples on April 2013.

SOME TRAITS OF REPRODUCTIVE BIOLOGY IN *Viviparus viviparus* AND *V. sphaeridius* (Gastropoda, Viviparidae) FROM UKRAINE

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Some peculiarities of reproductive biology in *Viviparus viviparus* and *V. sphaeridius* were investigated in Ukrainian part of their areals. The seasonal variations of number and size of viviparids embryos from two different habitats has been analyzed. The seasonal changes both of fertility and fecundity levels in these populations are also being examined. It is shown that female adults of viviparids contain a three age-class embryos throughout the year (June, 2010 – May, 2011). Embryos of second age-class (with 2.25-2.75 of shell whorls) are dominated in all periods. It was also noted that female fertility is predominated in Ukrainian populations during the year. Lowest fecundity in *V. viviparus* from river South Bug (2.63 embryos per mollusk individual) was noted in the summer 2010 whereas highest fecundity (20.88) was noted in the winter 2010-2011. It was found that maximal embryo numbers in *V. viviparus* (40) and *V. sphaeridius* (32) depends on the shell size. It was observed that the viviparid fertility levels in river Bucha was lower than in South Bug. By this is possible meant that the environmental conditions in river Bucha are unfavorable for viviparid mollusks.

MUTE SWAN *CYGNUS OLOR* SPRING-SUMMER GATHERINGS IN UKRAINE

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In the middle of the last century Mute Swan was usual breeding species in the large rivers deltas (the Danube, Dniester and Dnieper) in Ukraine. Since the 70-s step by step it started to breed on inland water bodies of the country. Penetration came from the Baltic (in Western Ukraine) and Black Seas. Now swans are breeding everywhere where it possible in the country.

But unusual phenomenon occurs to observe in 2013 – it is spring-summer gatherings. Six gatherings (10-50 birds) were recorded, what hasn't being seen here before. Definitely these birds were nonbreeding individuals, but why? Perhaps their numbers increase too much and all breeding sites were occupied. Therefore they have to spend summer period in large gatherings.

THE MODERN STRUCTURE OF MEIOBENTHOS UNDER PERMANENT ANTHROPOGENIC IMPACT IN THE SEVASTOPOL BAY (CRIMEA, BLACK SEA)

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Sevastopol Bay is under permanent anthropogenic impact and is being considered as one of the most technogenic polluted areas of the coastal part of Crimea. The research results on soft bottoms meiobenthos in Sevastopol Bay are presented. The material was collected at 14 stations across the whole basin of Sevastopol Bay at the range of depths 1,5 – 17 m in May 2013. For study of meiobenthos two replicate samples were collected by 18 cm^2 tube from the surface of the bottom monolith lifted by Petersen grab at each station. In parallel the parameters of the environment (Eh, pH, T, C_{org}, granulometry) were determined. Meiobenthos were presented by 14 taxa: Gromiida, Ciliophora, Foraminifera, Nematoda, Polychaeta, Oligochaeta, Turbellaria, Nemertini, Kinorhyncha, Bivalvia, Gastropoda, Harpacticoida, and Ostracoda. The dominant groups were Nematoda, Foraminifera (soft-shelled), Ciliophora, and Harpacticoida. The abundance of meiobenthos varied from 14000 to 900,000 ind./m^2 depending from the localization of the sample stations. Minimum abundance was observed in the inner part of the Bay.

Presented results were partly obtained with the support of PERSEUS EC Project No. 287600.

INTERANNUAL AND SEASONAL DYNAMICS OF THE BIOLUMINESCENCE FIELD AND PHYTOPLANKTON CHARACTERISTICS IN THE SEVASTOPOL COASTAL ZONE IN CONNECTION WITH THE HYDROLOGICAL FIELDS VARIABILITY

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The results of the bioluminescence field structure and phytoplankton community development investigation during regular monitoring in the Sevastopol coastal zone (January 2009 – September 2012) are given. Sea surface temperature (SST) standard deviation and mean were derived from the satellite data for the region and their seasonal and interannual variability were analyzed. The areas with extreme SST interannual variability have been found and interannual variability of the bioluminescence field produced in the Black Sea mainly by the phytoplankton has been analyzed.

Bioluminescence field was registered by multiple profiling of bioluminescence bathyphotometer that also allowed registering vertical profiles of water temperature, salinity and density in the layer 0-60 m. The phytoplankton samples were taken simultaneously by the 5 L bathometer from subsurface and bioluminescence maximum layer. The significant relationships between bioluminescence filed intensity and dinoflagellates biomass (luminescent, nonluminescent and total) have been found. The predictive model to estimate luminescent dinoflagellates biomass from bioluminescence intensity was developed based on linear regression equations.

Dependence of the biotic parameters interannual dynamics and climate specifics has been found during investigation period. Thus, in 2010 with the abnormally hot summer and warm winter, the maximum bioluminescence level, abnormally high values of phytoplankton biomass and high species diversity were registered whereas abnormally low water temperatures in winter 2012 led to the significant decrease in all the parameters. In the subsurface water layer there were two periods of intensive dinoflagellates development – spring (May) and autumn (October and November).). In 2012 combination of intensive cooling in February and quick warming of the surface water in April led to changes in the dinoflagellates community and bioluminescence field and shifted their spring maximum to the summer (June). In the summer stratified period there is a vertical relocation of the bioluminescence energy and deepening of the luminescent dinoflagellates development under the thermocline (30 – 60 m).

DISTRIBUTION, ABUNDANCE AND DIVERSITY OF WRASSES (LABRIDAE, PISCES) OF THE CRIMEA, BLACK SEA

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Actual data on spatial distribution of the wrasses fish (Labridae) in the coastal waters of the Black Sea coast of Crimea are investigated. The studies were conducted in the period from May 2005 to November 2011 on more than 80 stations along the coast of the Crimea, including wreks and MPA waters. Totally, we have performed over 2,500 SCUBA dives in different seasons at depths up to 72 meters.

Wrasses are the most common demersal fish in the coastal waters of the Black Sea and form the basis of ihtiotsenes of the hard soils. We noted seven species belonging to three genera, 5 species of the genus are Symphodus. The common species of wrasses were *S.tinca* (L., 1758), *S. roissali* (Risso, 1810), *S. ocellatus* Forsskål, 1775 and *S. cinereus* (Bonnaterre, 1788), a rare species and species with the protected status are *Ctenolabrus rupestris* (L., 1758), *Labrus viridis* L., 1758 and *S.rostratus* (Bloch, 1791), which were recorded just near the coast of Chersones cape. The greatest abundance and diversity of wrasses were observed near Sevastopol (Chersones and Aya capes) and near the west coast of Tarkhankut cape, the lowest - in the east coast of the Crimea.

STRUCTURE OF THE SUMMER ROTIFER ASSEMBLAGE IN THREE MACEDONIAN RESERVOIRS (KONCE 1, KONCE 3 AND SPILJE)

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The aim of this study was to examine the effects of environmental factors on rotifer assemblage in reservoirs that differ in size and trophic state: eutrophic system Konce 1 and Konce 3 and mesotrophic reservoir Spilje.

Qualitative analyses of summer rotifer composition in Konce 1, 3 and Spilje showed the presence of 12 and 10 taxa, respectively.

Rotifer assemblage significantly differed in their community structure, population densities and the occurrence pattern of dominant species, due to the significant differences observed in the environmental parameters measured between Konce 1,3 and Spilje. The average density of rotifers in Konce 1,3 system was 50.049 ± 7.825 ind l^{-1}, whereas 2.898 ± 4.08 ind l^{-1} were recorded in Spilje. In Konce 1,3 rotifers were dominated by *Brachionus falcatus, Brachionus angularis* and *Hexarthra mira*, contributing 28%, 27% and 23% to rotifer abundance, respectively. In contrast, in Spilje was dominant species *Kellicottia longispina,* comprising 47% of the total rotifer density. The significant correlation between certain environmental parameters and rotifers showed that rotifers are useful biological indicators of water body ecological status. In fact, their abundance, as well as species composition and distribution, often reflect the trophic status of aquatic ecosystems.

SEASONAL VARIATION IN *Stegomyia albopicta* OVIPOSITION DURING 2012 ON COASTAL PART OF MONTENEGRO

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On the beginning of survey of *Stegomyia albopicta* in Montenegro the state was divided in three regions: Coastal (23,98% population; 11,52% of total surface of the state), Central (47,34% population; 35,6% of total surface) and North region (28,69% population; 52,88% of total surface). During 2012, thefirst year of research, Coastal region have been in focus. Oviposition traps (Schaffner et al., 2012; Bellini et al, 1996; Carrieri et al., 2012) have been placed at 41 locality: 4 in used tires storages, 11 in urban areas; 13 in semi urban areas; 12 in main touristic resting places and one on border crossing to Coatia (by municipalities: 3 in Ulcinj, 5 in Bar, 8 in Budva, 7 in Kotor; 8 in Tivat and 10 in Herceg Novi). Traps were checked once every 10 days (8-12) from beginning of May until the end of October, 18 times in total. In laboratory eggs were counted, allowed to hatch and reared to the adult stage for species identification (Schaffner, et al 2012). Variability in eggs laying, per positive localities and whole period of time was over 100% in 26,83% cases, between 90-100% in 14,63% and between 50-90% in 58,54% cases. Standard deviation and variability in egg laying are also discussed separately for the beginning (May-July) and the end (August-October) of the season, as well as month by month alone. Seasonal appearance of larve and adults is also given.

HABITAT NICHE OVERLAP OF RAPTORS ASSEMBLAGE IN THE SOUTH OF OLTENIA REGION (COMMUNITY LEVEL ANALYSIS)

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The habitat niche overlap was studied across six habitat types in a raptors assemblage in the south of Oltenia region. We used a null model approach (Monte Carlo simulation) to test whether raptors community was structured or not by interspecific competition. Habitat overlap was calculated according to Pianka's formula and to assess whether the observed overlap values for different species pairs occurred by chance, we randomized the observed matrix of species utilization by two algorithms (RA2 and RA3). RA2 algorithm reveals that raptor species partitioned habitat niche in a non-random way in the study area, this pattern of habitat-type partitioning does not necessarily depend on competition but it is not a simple product of chance. RA3 algorithm could not discover a non-random raptors community organization.

Most null models do not distinguish between ecological niche shifts and character displacement. Species that differ gently in taxonomic and morphologic similarity may

nonetheless compete strongly. In our study area raptors overlap less (mean niche overlap value = 0.29139), morphology differentiation of species can explain the habitat separation and the low overlap over this niche dimension

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INVERTEBRATE ASSEMBLAGE FROM INUNDATED SAMPLES ALONG A PERENNIAL DISTANCE GRADIENT IN AN INTERMINTTENT STREAM FROM MEDITERRANEAN PART OF MONTENEGRO

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In this study study, we examined the response and recovery of invertebrate from inundated samples at three sites along an undisturbed intermittent stream in Mediterranean part of Montenegro. The onset of flow simulated by a 17-d experimental inundation led to the appearance of aquatic invertebrates in all samples. The desiccation resistant assemblage that appeared in inundated sediments after long dry periods was dominated by ostracods and oribatids, with lower densities of a small number of insect taxa. NMDS ordination show no significant changes in assemblage between the studied sites, but reveal changes with date (Rho = 0.47).

CARTOGRAPHY IN ECOLOGY - ECOLOGY IN CARTOGRAPHY

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Cartography is an universal language displaying every form of objective reality and therefore finds its application in presenting ecological themes also. Ecologic themes are very popular and spark the interest of the public daily. Cartography finds objects to display in ecological themes by fully booking its capacities, while ecology in cartography has a clear, obvious and lucid way of presenting its research and its results. Basic cartographic method, surely is the most current and the most concrete way of presenting numerous themes which treat this matter. Also, in a wide specter of possibilities of presenting thematic - ecologic maps many different methods are available which can, by specific topics of the map, be used for presenting different types of contents. Many different cartographic expressive means are used for realization of numerous cartographic methods which in a plastic way present the contents and turn the user's attention to characteristic points, appearances and processes that are taking place in the presented area. It is important to accentuate that obviousness and precision are important characteristic of cartographic expressive resources and that they reach their full application by presenting ecological themes and fulfilling the given terms. These two, basically conflicting properties, give the author of the map a chance to, with regard to the defined theme, choose the most obvious one in order to emphasize the important attributes of the presented contents and turn the attention of the user to the important indicators within the presented theme.

THYROID HORMONES AND ALCOHOLISM

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In this study we have experimental the model of alcoholism. Female and male rats Wistar albino were given 15% ethanol as only drinking solution daily one month before and during pregnancy and also during lactation. Control rats (n=12) received tap water. The interaction of alcohol with thyroid gland has not been well defined yet. It was generally accepted that long-term administration of ethanol has influence on thyroid gland morphology and thyroid hormone level too. The investigation of the impact of ethyl-alcohol (ethanol) on juvenile thyroid gland has been performed on one-day-old and 40 day –old white laboratory baby rats of strain Wistar.

The concentration of total tyroxine (T4) and triyodthyronines (T3) in blood serum has been determined by a radioimmunological analysis (RIA).

In alcoholized mothers' baby rats 24 h old there occurred a significant decrease of the level of thyroid hormones, both in triyodthyronines (T3), and in thyroxin (T4). The value T3 in these animals amounted 0.20± 0.02 nm/l, what is a significant decrease ($p<0.01$) in comparison with control animals in which its value amounted 0.29± 0.01 nmol/l whereas the T4 level in baby rats of alcoholized mothers amounted 28.20± 1.71 nmol/l and is also significantly ($p<0.01$) decreased in comparison to control animals, where it amounted 40.20± 1.59 nm/l.

In alcoholized mothers' baby rats 40 days old there occurred a significant increase ($p<0.01$) of the level of thyroid hormone, triyodthyronines (T3).

PRELIMINARY POPULATION STUDY ON DICE SNAKE – *Natrix tessellata* (Laurenti, 1768) FROM SKADAR LAKE

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The different combinations of genes, environmental impact and the adaptation of individuals to the conditions affecting the appearance of the field morphology difference between individuals of the same population. Dice snake – *Natrix tessellata* (Laurenti, 1768) in Montenegro were listed only as a kind of important for aquatic habitats, without detailed morphological and ecological parameters. This article presents the first morpho-ecological source of information on dice snake from Montenegro. Statistical data analysis included descriptive statistics, analysis of variance and covariance – ANOVA/ANCOVA and principal component analysis – PCA.

The results of analysis of ANOVA/ANCOVA showed a high degree of difference between the sexes of adults for all the characters except for the character width of the head, and that all of these parameters are relatively higher in females. An analysis of variability in the size and shape of the body showed that 97.54% of the variability is the result of differences in body size, and less than 3% in the form of the body. Principal component analysis showed a clear separation of the size and shape of the body between the males and females in adult categories, while this separation between males and females in subadult and juvenil category are very small.

Analysis of condition index showed negative values in adult females in the pre-hibernation, and in adult males in a post-hibernation period. It is interestingly, that values of the condition index are neagative in all periods in both sexes of subadult category.

Descriptive results are presented: the body color, nutrition analysis, the gender and age groups in the population and their analysis by season, seasonal and daily activity and behavior of individuals. The results of descriptive statistics, the results of ANOVA/ANCOVA and condition index values were compared with populations from the river Vrbanja (BiH) and the island Golem Grad – Lake Prespa (FYR Macedonia).

COMPARISON OF FISHERY EFFORTS (CPUE) DURING FISHING WITH LINES AND GILL NETS IN OPEN LITTORAL WATERS OF MONTENEGRIN PART OF ADRIATIC SEA

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We tested two fishing gears (lines and three panel gill nets) in terms of CPUE for each fished species. Calculated CPUE values shows that nets are more appropriate tool for fishing of *Solea impar* species in season when we convey our research. Lines showed as better but much more expensive tools then nets. Fishing with lines demand less fishing effort (higher CPUE values for all fished species) while in the same time gives opportunity for fishing on all marine substrates. Body sizes of caught species (total length and total weight) were significantly bigger for individuals fished on line then those fished with gill nets which result in higher CPUE values for lines as fishing tool. Species *Seriola dumerili* has highest CPUE value that significantly deviate from CPUE values for all other species we caught in researching season.

ENVIRONMENTALLY ACCEPTABLE FLOW – A NEW MODEL FOR MONTENEGRIN RIVERS

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This paper reports about new developed model for sustainable usage of water bodies (rivers and lakes). New model appreciate both demands, conservations of nature as well as developmental and economical needs of Montenegrin society. We give comparative overview of several models and the new developed one which are applied on two Montenegrin rivers (Obodska and Cijevna river). Our model guaranty better environmental conditions for aquatic organisms during the most important part of the year, breeding season, and allow usage of water in developmental purposes in the same time.

SOME LIFE HISTORY TRAITS OF *Salmo farioides* FROM MORAČA RIVER (MONTENEGRO)

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The length–weight relationship, condition factor, sex ratio and fecundity of the Adriatic brook trout, *Salmo farioides* were studied in specimens from the upper part of the River Morača during the pre-spawning period. A total of 253 fish were examined; the ratio of matured males to females was estimated as 1 : 0.5. Total lengths ranged from 5.1 to 36.1 cm. The length–weight relationship showed a positive allometric growth only for juvenile (age 0^+). The length–weight relationships were described as $W = 0.0124\ TL^{2.96}$ ($r = 0.9907$) for males and $W = 0.0093\ TL^{3.05}$ ($r = 0.9862$) for females, $W = 0.0052\ TL^{3.33}$ ($r = 0.9418$) for juvenile (age 0^+) and $W = 0.0129\ TL^{2.91}$ ($r = 0.9812$) for non mature ♀♂(age 1^+,2^+,3^+). Absolute fecundity ranged from 137 to 1455 eggs, and relative fecundity from 210 to 596 (mean 310.89) eggs per 100 grams of body weight. The minimum size at first sexual maturity was 13.7cm TL for females, and 11.4cm TL for males. Estimates of the average K ranged from 1.033 as shown by the juveniles 0^+, to 1.10 as shown by the mature males. Significant differences were found between mature specimens (male and female) and between juvenile specimens at age 1+ to 3^+ ($P < 0.01$).

Terrestrial and aquatic ecosystems

HABITATS' EVOLUTION AND BIRDS FAUNA'S DIVERSITY IN THE JIJIOARA RIVER BASIN (ROMANIA)

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We present our four years fieldworks' results on the birds' diversity and seasonal presence, including breeding birds populations on the valley of Jijioara River. This area is part of the Nature 2000 site ROSPA0042 *Ponds of Jijia and Miletin Rivers*. The investigated area is represent by one reservoir and a fishery ponds network, with habitats mosaic; there exist open waters and reed beds, swamp areas, dry meadows, arable lands, shrubs and bushes areas, some small clusters of trees.

We recorded 128 bird species, including some rare breeding species in Romania like *Platalea leucorodia*, *Recurvirostra avosetta*, *Himantopus himantopus* and some species with negative trend in our country like *Ardeola ralloides*, *Anas strepera* or *Porzana parva*, all of them being recorded with small number of breeding pairs in the area. Between the globally threatening bird species, we mention Ferruginous Duck (*Aythya nyroca*) and the Corncrake (*Crex crex*). During the passage, hundreds individuals of waterfowls present and waders are present on the suitable feeding areas.

Regarding the fish-eaters birds, in the migration time, the cormorants (*Phalacrocorax sp*.) appear in groups about 200 – 350 individuals, while the gulls and terns are breeding with very small effectives, using the area like stop-over point, especially during the autumn migration. In the western part of the site, we found a very high level of habitats' degradation, the birds' diversity presenting constant negative trend during our study period.

IMPORTANCE OF REPRESENTATIVE SEDIMENT SAMPLE FOR ENVIRONMENTAL INTERPRETATION: A CASE STUDY IN THE LAKE VISOVAC, KRKA RIVER, CROATIA

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Sediment is ultimate sink for all pollutants which enters in some aquatic environment and a possible delayed source of pollution. Also, sediment contains good historical record of paleoenvironmental conditions, but for correct environmental interpretation, representative sediment samples are essential.

To determine representativeness of sediment sample for studied area (Krka River National Park, Croatia), sampling was carried out in three regular plots (2 x 2 m, 3 x 3 m) at the bottom of the Visovac Lake where undisturbed sediments and continuous sedimentation were expected. 14 sediment columns were sampled by scuba diver with hand-driven acrylic corer. Sediment columns were cut in 5 cm slices and analyzed for activities of natural radionuclides (^{40}K and ^{232}Th) which are known as a good tracer of terrigenous material input.

Statistical analyzes of obtained results show good correlation (> 0.95) of ^{40}K and ^{232}Th activities in all three (0-5 cm, 5-10 cm, 10-15 cm) investigated sediment layers. Activities of ^{40}K and ^{232}Th are decreasing downstream, indicating decreasing of terrigenous

material input. Spatial variations in small distances (1m) were considerable in upper part of the Lake. That is especially evident in the surface sediment layer (0-5 cm) where variations between neighbor samples may influence environmental interpretation.

EVALUATION OF SARDINE *(SARDINA PLICHARDUS)* POPULATION STRUCTURE BY LENGTH AND AGE INDICATORS

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Sardine (*Sardina plichardus*) is dominant small pelagic species in the waters of the Mediterranean and Adriatic Sea. Knowing the age of the fish allows fisheries managers to understand the dynamics of marine reserve.

The purpose of this study was to define the age of sardines, as one of the important indicators for the assessment of fishing reserves. Determination of the age assessment based on sagittal otoliths, which found in the inner ear of fish.

The study was conducted at the Research Institute of Fishery in Durres, in the period January 2008 - December 2010. During this time, 990 fish were analyzed monthly. For each individual records were kept for weight and height. The otoliths were removed from neurocranium, watched in stereomicroscope (40 X) annual assessment circles around the otolithis opaque core. Age of fish is equal to the number of annual rings.

The study showed that the age average was 1.44 year (sd = 0.658), and 90% were 1+ and 2+ years. The average length was 13.27 cm. and about 44% of sardines with length 12.5 - 14 cm. The study will help determine the dynamics of populations of sardines accurately predicting the amount of hunt's fish.

MODELING WATER QUALITY IN THE LAKE SHKODRA USING CE-QUAL-W2 MODEL

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The main goal of this study, as part of an effort to understand the water quality dynamics in Lake Shodra, was to provide a calibrated water quality model capable of predicting future water quality conditions resulting from potential changes in lake operations and/or environmental conditions. The 2-D laterally averaged CE-QUAL-W2 model was used to simulate water quality in Lake Shkodra, for the years 2005 through 2009. Once the necessary data have been assembled into proper input format, and then simulations began. The model parameters initially were calibrated using the data from 2005 - 2006 and tested with data from 2007 - 2008. Calibration was done iteratively until an acceptable fit of the predicted and observed data was achieved. The calibration process produced an integrated modeling system of CE-QUAL-W2 with sufficient accuracy to allow evaluation of lake water quality response.

Input data required for model setup were divided into four broad categories: physical and spatial characteristics of the water body defining the computational grid; time-varying boundary conditions describing the meteorological and hydrologic influences on the water body; initial conditions, and kinetic and hydrodynamic data characterizing the physical, chemical, and biological processes. The sample data for each water quality parameter was statistically analyzed. Model results revealed that model calculated concentrations of key water quality indexes matched well with the measured values. The modeling results presented here provide a starting point for simulating the water quality in the lake. The results and conclusions from this study are not intended for use on Lake Shkodra alone. The concepts of model development can potentially be applied and also broaden its usefulness to other surface water systems.

PROTECTED SPECIES OF DRAGONFLIES (INSECTA: ODONATA) AND MAYFLIES (INSECTA: EPHEMEROPTERA) IN THE LOWER PRUT FLOODPLAIN NATURAL PARK ROMANIA

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The aquatic insects of the orders Ephemeroptera and Odonata are one of the most abundant and widespread groups of aquatic invertebrates, with adaptations which allow them to colonize the wide range of lotic and lenthic habitats typically present in functioning flood plain systems. So far, there are no studies existing that studied the aquatic insects of the Lower Prut Floodplain Natural Park on the basis of larva stages. Thus, we sampled benthic invertebrates in the Lower Prut river channel and adjacent floodplain lakes, in order to determine the hot spots of dragonfly and mayfly diversity there. Results showed that benthic invertebrate diversity was least in the floodplain lakes, which were eutrophic and fell dry during summer. Highest diversity was found in habitats within the permanent river channel. Notably, a population of the *Palingenia longicauda* (Ephemeroptera), the most endangered mayfly species of Europe, was discovered living at the lateral slopes of the river channel. In addition, *Gomphus flavipes* (Odonata) was recorded, which is mentioned in the European Union Habitats Directive as a Community interest species which require strict protection. These records in the Prut significantly enlarges the known distribution of these species and provide an informative framework to pursue future efforts of habitat management to improve and maintain habitat integrity.

PRELIMINARY DATA ON MICROBIOLOGICAL QUALITY ASSESSMENT IN DIFFERENT FISH SPECIES FROM LUMBARDHI RIVER, KOSOVO

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The principal objective of this study was to evaluate the microbial pollution impact of water in different fish species from Lumbardhi River in Kosovo. Physico-chemical parameters of water quality such as temperature, transparency, and pH were monitored.

Fish samples were collected during March-June 2013 using electrofishing method, alongside Lumbardh river. Bacteriological analyses involved *Salmonella*, faecal coliforms (FC), faecal streptococci in the following fish species: *Salmo trutta m. Fario, Squalius cephalus, Rutilus rutilus, Gobio obtusirostris* and *Carassius gibelio*.

Concerning physicochemical parameters, results showed that the temperature values varied from 17°C to 25°C and the transparency from 0.4 m to 2.2 m. On the other hand, the results show different levels of microbiological pollution in the different parts of the Lumbardh River. Salmonella, faecal coliforms and faecal streptococci are very good biomarkers of microbiological pollution of water, and can be successfully used as bioindicators of early detection of water pollution in biota.

NON-BITING MIDGES (CHIRONOMIDAE) OF SERBIA – REVIEW OF THE MIRJANA JANKOVIĆ STUDIES

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The presentation mainly consists of research results on Chironomidae fauna conducted by M. Janković in Serbia during period 1957-1998, as well as the results of R. Nedeljković (1979) and Milošević (2011). M. Janković revealed 163 species of Chironomidae at 173 sites. 44 species recorded by M. Janković have not yet been included in the list of Fauna Europaea for Yugoslavia region. Among species found by M. Janković there are rare ones, requiring protection, like *Anatopynia plumipes* and *Chernovskiia macrocera*. Multivariate analysis clearly separates assemblages of small streams in the Carpathian Mountains from the communities of larger flowing rivers present in the rest of the country. Studies on the zoobenthos conducted in Serbia in the last two decades, only to a small extent continue the studies of M. Janković. Investigation of Milošević from the South Morava partially confirm, but also reveal certain distinction when compared with the results of M. Janković. Due to the lack of reference collection it is difficult to verify the achievements of research on Chironomidae of Serbia made in the 20th century.

THE CHIRONOMIDAE (DIPTERA) FAUNA OF GREECE: ZOOGEOGRAPHICAL DISTRIBUTIONS AND NEW RECORDS

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A faunistic list of the Chironomidae family from Greece is presented along with its zoogeographical distribution. Chironomidae larvae and pupal exuviae were collected from 61 locations in mainland Greece during 2006-2008. Overall, 76 taxa were recorded. Six genera are recorded for the first time from Greece. Furthermore, 12 species are new for Greece and 5 are new for mainland Greece. Chironomidae collected from running waters were analysed with multivariate techniques. The results revealed that Chironomidae assemblages were distinguished into three zoogeographical regions with distinct climatic, geological and hydrochemical features. Running waters in northwestern Greece were generally dominated by species tolerant to water acidification. Chironomids typical of eastern uplands preferred relatively slow current and soft bottom sediments. Assemblages of the southern Peloponnese Peninsula were represented by species of relatively fast flowing, warm streams. This is the first study contributing to the knowledge of a rather neglected insect group of the Greek fauna.

NEW SPECIES OF NON-BITING MIDGES (DIPTERA, CHIRONOMIDAE) FOR COASTAL REGIONS OF CROATIA AND MONTENEGRO

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Balkan Peninsula is one of the last regions in Europe where water insect fauna is relatively weakly recognized. Presence of diverse freshwater habitats indicates potentially high biodiversity in the region. Imagines and pupal exuviae of non-biting midges (Chironomidae) were collected in coastal area of Montenegro and Croatia in autumn 2010 and in summer 2012. *Eukiefferiella fuldensis*, a new species for Montenegro, is reported from stream near Petrovac. *Tanytarsus lactescens* and *Kiefferulus tendipediformis* were recorded from Mljet Island. According to Fauna Europaea database (2013), these are new species for Croatia. The above species are widespread in Europe. So far, in the Balkan Peninsula, *K. tendipediformis* was found in Bulgaria, Romania and Turkey; *T. lactescens* only in Romania. *E. fuldensis* was not recorded in the region. *Eukiefferiella fuldensis* is stenotherm, rheophil-rheobionte species typical for cold mountain stream. *T. lactescens* and *K. tendipediformes* are rather associated with slow flowing and eutrophic stagnant waters. Prior to the finding of *E. fuldensis*, the other congeneric species, *E. brevicalcar* and *E. clypeata*, were recorded from Montenegro. Also, larvae belonging to *E. fittkaui* agg. and *E. ilkleyensis* agg. were found in river Morača and in a few other small flowing waters in previous studies (presented on 3th ISEM). With these new records, the list of Chironomidae taxa reported from Montenegro contains 30 species and the list of midges recorded from Croatia comprises 77 species.

TEST AND VALUDATION OF AQUA-CROP MODEL IN SIMULATING CANOPY COVER, BIOMASS AND GRAIN YIELD OF IRIGATED AND WATER DEFICIENT FIELD MAIZE

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Accurate crop development models are important tools in evaluating the effects of water deficits on crop yield or productivity. FAO Aqua-Crop is a water-driven simulation model that requires a relatively low number of parameters and input data to simulate the yield response to water. Its parameters are explicit and mostly intuitive and the model maintains sufficient balance between accuracy, simplicity and robustness. Although the model is simple, it emphasizes the fundamental processes involved in crop productivity and in the responses to water deficits, both from a physiological and an agronomic perspective. To understand the response of maize to water and to simulate the canopy cover and biomass production under various water inputs, it is tested the FAO Aqua-Crop model versions 3.0 using independent data sets during the cropping seasons of 2006-2009 at Lumalas site in southeastern Albania. So, in this study, aqua-crop model is parameterized and tested for corn under full (100%) and deficit (50, and 33% of full) irrigation regimes. The results are presented and discussed by years, and comparisons are made between simulated and measured values of canopy cover and cumulative biomass as sampled at intervals over the growing season, and the final biomass and grain yield. Results from this study provide a set of first estimates for these difficult-to-determine maize parameters and show that FAO Aqua-Crop is a useful tool to assist managers for making decisions in maize irrigation under water supply restrictions. Model parameterization is site-specific, and thus the applicability of key calibrated parameters must to be further tested under different climate, soil, variety, irrigation methods, and field management.

COMPOSITION AND SEASONAL VARIATION OF PHYTOPLANKTON COMMUNITY UPSTREAM OF DEVOLLI RIVER (EASTERN ALBANIA)

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Phytoplankton composition and abundance at three selected stations upstream of Devolli River, Eastern Albania, were investigated seasonally during 2011. A total of 122 taxa were recorded, of which 44 species were common at all stations. Diatoms (Bacillariophyceae) were the dominant group with 80%, followed by green algae (Chlorophyceae) with 10%, blue-green algae (Cyanophyceae) with 8% and euglenoids (Euglenophyceae) with 2%. More than 45% of the identified species belong to the five genera *Cymbella*, *Fragilaria Navicula*, *Nitzschia* and *Scenedesmus*. There were a few species which showed high cell numbers and found at all stations investigated, such as *Achnanthidium minutissimum* (Kützing) Czarnecki, *Cyclotella meneghiniana* Kützing, *Fragilaria crotonensis* Kitton, *Synedra ulna* (Nitzsch) Ehrenberg, *Chlorella vulgaris* Beyerinck and *Pediastrum boryanum* (Turpin) Meneghini. Highest species numbers were found at the first station. Cell counts were dominated by diatoms with two peaks during summer and autumn.

MULTIPLICITY OF ECOSYSTEM STABLE STATES AND SLEEPING BIODIVERSITY: TOWARDS A DEEPER UNDERSTANDING OF BIODIVERSITY DYNAMICS

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The biological systems - from molecular to ecosystem - have several alternative stable states is a new paradigm in biology and ecology, instead of one that considers the biological systems as having one point of global stability. Structure of ecosystems of extreme habitats is more responsive on the climate change; alternative states are distinguished more clearly for them. Hypersaline is among most extreme environments; we focus on ecosystems of the Crimean hypersaline lakes. Ecosystems of these lakes can be in several alternative stable states (to 5-7). The different functional groups of primary producers (plankton, floating mats, bottom biofilms, etc.) play a leading role in the different ecosystem states. A heterotrophic part of communities has also a different composition. In every ecosystem state a most part of total biodiversity is in non-active "sleeping" stage (different dormant stages). It was shown for bacteria, algae, infusorians, and animals. Every transit of ecosystem from 1st alternative steady state to a new one goes through a destabilization and disintegration of old structure. Bank of dormant stages is an ecosystem memory; it takes part in forming of new alternative ecosystem state. Ecosystem dynamics consists of two stages – coherent (fluctuations around single point of stability) and uncoherent (disintegration and forming new state).

HYDROGRAPHIC AND ZOOPLANKTON DATA IN THE BAY OF KOTOR COLLECTED DURING 2007/08

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Zooplankton was collected in the Bay of Kotor, coastal waters of southern Adriatic, from November 2007 to October 2008. At the same time we measured such hydrographic factors as temperature, salinity and transparency of sea water. The maximum temperature (28.2°C) was found in August and the minimum temperature (13.8°C) in February. Homothermia occurred in March. Maximum salinity was 39.00‰ at a depth of 25m in June. Minimum salinity was 15.08 in the surface layers during April. Transparency of the sea water was 18-36m in depth. We analysed zooplankton groups taking part in the total zooplankton collected from the study area. The following zooplankton groups were included in the analysis of species: Cladocera, Copepoda and Copelata. In the plankton samples of the study area we reported 5 species of Cladocera, 5 species of Copelata and 41 species of Copepoda. The order of abundancy and heterogeneity of zooplakters in the total sample was as follows: Copepoda 78%, Copelata 0,9%, Siphonophorae 0,88%, Chaetognatha 0,76%, Ostracoda 0,08%, Cladocera 15,7%, Pteropoda 1,2% and finally Medusae, Polychaeta, Desmomyaria nd Cyclomyaria which as a group consisted of less than 2%.

TROPHIC STATUS OF RESERVOIR "STREZEVO", REPUBLIC OF MACEDONIA

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"Strezevo" reservoir is located in the southwest part of Republic of Macedonia and it is formed on the bottom of Pelister massif. It is multipurpose reservoir which provides water for irrigation arable land of Pelagonija, water supply of population and industry, electric power production etc. Due to this wide range of function of this reservoir and its big importance for the region as well as for the Republic od Macedonia, investigations for the determination of the water quality throught monitoring physico-chemical and biological parameters have been taken. From the physico-chemical parameters in this paper will be presented some parameters like: concentration of dissolved oxygen, organic biodegradable matter (consumption of $KMnO_4$), total nitrogen and total phosphorus, and from biological parameters: concentration of chlorophyll a, total number of heterotrophic bacteria and total coliforms.

The aim of this paper is to obtain a complex picture of the water quality state from this aquatic ecosystem by using some physico-chemical and biological parameters. For this purpose seasonal dynamic of water samples collecting from the reservoir in 2010-2011, is provided from different sampling points.

The trophic status of "Strezevo" reservoir is determined with the application of the Carlson trophic state index (1977), OECD fixed boundary system for lakes in the moderate climate zone (1982) and according to the classification system founded upon the average summer values of the trophic paramerets in the surface level of the lakes according Forsberg & Ryding (1980) and Nünberg (1996).

Numeric values for the Carlson trophic state index based on Secchi disk transparency, concentration of total phosphorus and chlorophyll a, shows that the water from the reservoir Strezevo is of oligo-mezotrophic character.

Based on results from the microbiological investigations and according to the categorization of Kohl (1975) and Decree of the classification of waters (Nr 19/1999), water from "Strezevo" reservoir was mainly in I and II category.

Generaly, results from physico-chemical and biological analysis of the water from "Strezevo" reservoir shows that this aquatic ecosystem can be used for water supplying, irrigation, industry etc.

TERRESTRIAL MACROINVERTEBRATES OF SEED BUGS (LYGAEIDAE HEMIPTERA) IN DIFFERENT ECOSYSTEMS

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This paper present studying of *Lygaeidae* for the different ecosystems in Krrabë, Ibë, Petrelë, Peqin and Miraka stations. This stydy is important on the taxonomycal and ecologycal aspects to the fauna. The biological material is collected during the expeditions of 2011-2012. The collection of biological samples was achieved through the use of entomological nets of

80cm diameter. Mowing with entomological nets is achieved according to the diagonals for surfaces of 100 m^2 (10m x 10m), passing five times across each square' diagonal. The fine biological materials were placed in plastic flacons 150-200 ml. The biological samples were analyzed and determined by Stereomicroscope *ZEISS*. In that study it has been determined 48 individuals. The family *Lygaeidae* was presented by 12 genus and 17 species. The *Lygaeus* genus was represented by the highest number of speies, by 3 species, and frecuency 17.65%. Analyzing of the material to the stations, it has been found that the station with highest number of species, resulted the Petrelw station, with 10 species or frequency 58.82%, while with less species, is Mirake with with 4 species or frequency 23.53%.

DATA ABOUT FAMILIE MIRIDAE (HEMIPTERA) IN DIFFERENT HABITATS OF ALBANIA CENTRAL

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This study presents some qualitative and quantitative comparative data on the species of plant bugs (Miridae) collected in mountainous, hilly and field habitats in Krraba Iba, Petrela, Peqin and Miraka station. The collection of biological material is performed during the period 2011-2012. 77 individuals were analyzed, which represented 27 species and 17 genera. The genera Deraeocoris were the most represented with 4 species, or frequency 14.81% respectively. Most of the species, 10 species or frequency 69% were found in habitats of Kerrabe. More represented is the Paleartik Zoogeographic region by 8 species or frequency 29.63%.

LEVELS OF HEAVY METALS (MERCURY, LEAD, CADMIUM AND CHROME) IN DIFFERENT TISSUES OF TWO BENTHIC FISH SPECIES OF ADRIATIC SEA

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The purpose of the study was to monitor and evaluate the concentration level of heavy metals in different tissues of *Lophius piscatorius* and *Mullus barbatus*. Both benthic fish species used in this study originated from Adriatic Sea. The concentration level of heavy metals was measured by using atomic absorption spectrophotometer (AAS). According to the results the concentration levels of Hg, Pb, Cd and Cr measured in the muscle tissue of fish species was lower than the maximum permitted level for human consumption set by EC regulation. The results indicate that heavy metal concentration in muscle tissue of both fish species are within acceptable levels for human consumption.

THE SEASONAL POPULATION DYNAMICS OF THE CENTROHELID AND ACTINOPHRYID HELIOZOANS (CENTROHELIDA, ACTOPHRYIDA) IN ARTIFICIAL POND (UKRAINE)

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The seasonal variation of centrohelid and actinophryid heliozoans populations were monitored in pond near the village Khotov at the vicinity of Kiev (Ukraine) over 31.08.2006-02.08.2008 and 06.04.10- 14.10.2010.
We observed seasonal replacement of vegetative stage and resting stage (cyst) of these organisms. The most part of winter the vegetative stages of centrohelid and actinophryid heliozoans were not recorded. During the winter period we registered centrohelid cysts which were attached to detritus.

We revealed three features in seasonal dynamics of centrohelid and actinophryid heliozoans. First, in seasonal dynamics three peaks of centrohelid and actinophryid heliozoans density were registered: in March-April, in July-August and in October-December. Second, seasonal dynamics was characterized by rapid growth of density (as a result of increasing cysts concentration in water column with following transformation in vegetative stage), maximization of density (often as a result of fission) and rapid decline with elimination (transformation in cysts). Third, species of centrohelid and actinophryid heliozoans developed one after another. Abundance peak of different species did not coincide. Maximum of actinophryids forewent abundance peak of centrohelids. The most abundant species of centrohelids have different seasonal dynamics and developed one after another: *Choanocystis aculeata* have two peaks of density (in March-April and October-December) and *Raineriophrys forstesca* has one abundance peak (in July-August).

SEASONAL CHANGES ON HEMATOLOGIC AND BIOCHEMICAL PARAMETERS OF *CYPRINUS CARPIO* (LINNAEUS, 1758) IN NATURAL CONDITIONS

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Cyprinus carpio (Linnaeus, 1758) is one of the most important species of Shkodra Lake in scientific and economic aspects. This study was carried out between Mars 2011 and Mars 2012 and involved 80 healthy individuals of fish, randomly collected. The objective of this study was therefore to analyze and compare blood parameters in relation to seasonal variations *Cyprinus carpio* (Linnaeus, 1758) in the Albanian side of Shkodra Lake. Hematological parameters determinated in blood sample were erythrocyte count, leukocytes count, hemoglobin density and hematocrit value; while biochemical indices were glucose, protein and cholesterol. The results showed that hematogical parameters of blood were statistically different ($p<0.05$) in spring-summer period compared to other periods of year and the biochemical parameters of blood were statistically different ($p<0.05$) in autumn-winter period compared to other periods of year.

FACTORS SHAPING THE COMPOSITION OF PHOTOTROPHIC COMMUNITIES IN MEROMICTIC FRESHWATER LAKES

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Phototrophic communities of four meromictic lakes studied in 2004-2009, an urban pond in Samara and three forest karst lakes in Mari El Republic, have been compared. Three of the lakes had sulfide-containing monimolimnion. The composition and abundance of phytoplankton in the mixolimnion of these "euxinic" lakes was variable and reflected the trophic state of the lakes, which varied from oligotrophic (Shungaldan) to eutrophic (Cherny Kitchier). However, the pecularities of the phototrophic communities of the chemocline zone and monimolimnion of the lakes were more similar.

In the fourth lake, Kuznetchicha (Zvenigovsky district, Mari El rep.), the monimolimnion contains high concentration of iron (II) hydrocarbonate (>250 mg/l Fe in 1969, 120 mg/l in 2009), but only traces of sulfides were detected. Two mineralization gradients have been observed in the lake in June, 2009, the upper, less pronounced, coincides with the summer thermocline. Unlike the "euxinic" lakes, no "microbial plate" of phototrophic organisms has been observed. Instead, their development was relatively evenly distributed in a wide range of depth from the thermocline to main chemocline. Its composition also differed significantly from the three "euxinic" lakes, and was closer to polihumic dimictic lakes of the region with high concentrations of iron in the water column.

THE SEASONAL AND ANNUAL DYNAMICS OF PHOTOTROPHIC PLANKTON COMMUNITIES FROM THE SMALL URBAN MEROMICTIC POND

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Bacterioplankton and dominant species of phytoplankton have been studied during 2004-2005 and 2008 in a small meromictic pond of the Samara Botanic Garden.

The total number of bacteria has been always the highest in monimolimnion. During the most part of ice-free period phytoplankton development was concentrated in the chemocline, in a narrow zone overlapping with the "microbial plate" of the anoxigenic phototrophic bacteria (APB), while it's abundance in the mixolimnion was low.

Chemocline communities of the pond underwent strong seasonal variations. During the ice-free period the dominance in phytoplankton was shifting from euglenoids to cyanobacteria and then to cryptophytes and sinurophytes. In the late autumn phytoplankton development was spread to the mixolimnion and the algal "bloom" occurred in the surface layer. In winter the abundance of phototrophs was weak and their vertical distribution was relatively even. Species composition of APB was less variable; their maximal abundance was reached in summer months.

Interannual variations of the structure of chemocline community have also been detected. In 2004-2005 APB community dominated Chlorobium clathratiforme and Tiocapsa rosea; in 2008 the extent of Chl. clathratiforme dominance decreased due to the development of other species of Chlorobiaceae, a dominance of Chromatiaceae passed to Thiodiction elegans.

THE ROLE OF BACTRERIOPLANKTON IN FUNCTIONING OF MARINE ECOSYSTEM

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The analysis of our earlier obtained data on bacterioplankton morphometry in the Mediterranean and Black seas open waters have been conducted. Correlations of rod-like and cocci-like forms, depending on activity of the microbiological processes in water thickness have been given.

Cocci-like forms dominated in the Mediterranean and Black seas. At separate narrow horizons we marked an increase of rod-like forms, connected with an input of easily accessible organic matter of autochthone and allochthone origin.

Evaluation of the plankton aggregatedness in waters with different trophicity has been given. Considerable part of the microbial population is associated with suspension particles, size of which is acceptable for uptake not only by thin, but by rough filtrators as well, which testifies to quite high trophic role of bacteria in the water areas studied.

Productive activity of bacteria in the near-surface layer of water in the Mediterranean basin seas has been estimated.

The data we obtained testify to an important ecological role of bacterioplankton in functioning of marine ecosystem.

BIOMASS OF PELAGIC CRUSTACEA: CLADOCERA IN THE LAKE OHRID (MACEDONIA) FOR THE PERIOD 2000-2009

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In this paper the biomass of Crustacea: Cladocera in Lake Ohrid pelagic zone were studied throughout the period 2000-2009.

In the last several decades Lake Ohrid has been exposed to great pressure from anthropogenic influences. According to obtained results the cladocerans biomass varies during the investigated period.

During the winter and early spring the biomass values of the Cladocera remain low, because only two species of small quantity have been registered *Daphnia Pulicaria* and *Bosmina longirostris*. The summer-autumn period notices a remarkable increase of the biomass in Cladocera when apart from the autochthonous species; there is also an evidence of the two allochthonous species *Diaphanosoma birgei lacustris* (present in greater numerical values) and *Leptodora kindtii*.

High values of the cladocerans biomass were evidenced in the summer-autumn period 2008 and in the summer-autumn period 2009, when the biomass of cladoceras significant increased in comparison with other investigated periods.

The increased values of the cladocera biomass will have significant effect on the biomass ratio between copepods and cladocerans which direct to certain changes in zooplankton community.

SOME MONITORING DATA ON BACTERIAL LOAD OF DEVOLLI RIVER, ALBANIA

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We live in a changed and changing world, where the impact of human activities is more than evident. One of our duties is to monitor continuously human impact in environment and for this reason we decided to monitor water quality of Devolli River, as one of important rivers in southeast of Albania, based on microbiological indicators. The Devoll is a river in southern Albania, one of the source rivers of the Seman. Devoll passes through many urban areas and a relatively high human impact is expected.

Samples are collected every month from December 2012 till June 2013 in five stations along the river in Devoll District. Most Probable Number index is used for evaluation of total coliform bacteria in water, while the number of heterotrophic bacteria is determined by counting colonies on plates with PCA, cultivated with 0.1 ml sample after a series dilutions.

According to preliminary results, as it was expected, there is a high load of feacal coliform bacteria and heterotrophs in sample stations near urban areas. A seasonal change is observed in bacterial parameters. The human impact in the quality of water of Devoll river is more than evident.

A PRELIMINARY ASSESSMENT ON SEASONAL VARIATIONS OF QUALITY INDICATORS OF TIRANA LAKE

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There are many factors influencing the condition of a lake including physical dimensions (morphometry) , nutrient concentrations, oxygen availability, temperature, light, and fish species, etc. This work comprises results of the examinations of a number of indicators aiming to evaluate the environmental state of Tirana Lake water. Due to concerns about potential pollution resulting from watershed sources and adjacent increased human activities, investigation of the long-term changes in the trophic state of this lake was conducted during the period September 2011 - January 2013. Ammonia nitrogen (NH_4^+-N), soluble reactive phosphorus (PO_4^{3-}-P), nitrates and nitrites as well as physic-chemical parameters were analyzed every three months, in six different points of the lake. According to the results obtained, dissolved oxygen, phosphorus and ammonium nitrogen were found to be the primary limiting nutrients of the lake. Content of SRP resulted to be higher during June 2012, ranging from 24 to 65 $\mu g.L^{-1}$, while the levels of ammonium nitrogen were the highest during December 2011, ranging from 0.28 to 0.44 mg. L^{-1}. Dissolved oxygen was found in low levels in samples collected during September 2011 (5.4 – 7.9 $mg.L^{-1}$) while high levels were found in winter and spring as well. Conclusively, estimation of the trophic state based on nutrient levels being present in waters of Tirana lake can classify it as a mesotrophic state ecosystem.

THE COLLEMBOLA FAUNA OF DIFFERENT MICROHABITATS OF BECICI BEACH, MONTENEGRO

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Collembola fauna has been investigated in different microhabitats near the beach in Becici, Montenegro. Samples were taken from four locations: Green Stone, Hotel "Tara", hotel "NAFTAGAS" the church "St. Thomas" and a total of four different microhabitats: under larch, white pine, palms and cypresses, with the site of hotel "NAFTAGAS" samples taken under the larch and white pine. Samples were taken in May and September 2010, for each location, and results were presented as qualitative findings.

Total number of 27 species of Collembola were identified classified into six families and 15 genera. Representatives of the family Hypogastruridae Börner, 1901 and Isotomidae Schaffer 1896 were found in all the studied sites, while representatives of the families: Neanuridae Börner, 1901, Onychiuridae Lubbock, 1876, Entomobryidae Schaffer 1896 and Sminthuridae Lubbock, 1862 were present only on some locations.

The biggest number of species and highest population density of Collembola was found at the Green Stone site, micro-habitat white pine, and small number of species 6 on each site was recorded at at "Tara" hotel and Sv. Thomas church.

LENGTH-WEIGHT RELATIONSHIP AND CONDITION FACTORS OF THE BOGUE, BOOPS BOOPS (LINNAEUS, 1758) IN SOUTH ADRIATIC SEA (MONTENEGRO)

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Seasonal changes in length-weight relationships and condition factors (Fulton's and Le Cren's) of bogue; *Boops boops* (Linnaeus, 1758) were studied. Samples of bogue were collected monthly from the commercial landings during the period from September 2007 to September 2008 on Montenegrin shelf. A total of 933 individuals were measured and weighed. The total length of all analyzed specimens ranged from 10.0 to 25.9 cm and weights ranged between 9.35 g and 156.28 g, respectively. On the whole sample, the largest fraction was females (55.2%), 43.3% were males and 1.5% was undetermined. Sex ratio (M / F+M) was different from 1:1, females predominated (0.44). The length-weight relationship of females, males and all sampled specimens was described by the expression: $W=0.0192*L^{2.7443}$, $W=0.0218*L^{2.6864}$, $W=0.0203*L^{2.7184}$, respectively. The *b* values of LWRs varied during the year with season and condition. During the winter, the length-weight relationship indicated isometric allometric growth (b=3.0283), while in other season there was indicated negative allometric growth. Fulton's condition factor ranged from 0.9065 to 0.99 and Le Cren's condition factor ranged from 1.0024 to 1.0051.

DATA ON MACROZOOBENTHOS OF THE RADHIMA COAST,VLORA BAY, ALBANIA

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Macrozoobenthos of shallow rocky coast of Radhima area (south-eastern part of Vlora Bay, Albania) has been studied, focusing on the supralittoral, mediolittoral and upper limit of the infralittoral during 2006 – 2008. Replicated quantitative samples have been taken in April and October each year, by using a reticulated frame as a standard sampling area unit. This study gives data on species composition of macrozoobenthos and a general assessment of quantitative characteristics, seasonal variations and stability of zoobenthic populations in the studied area. A total of 76 taxa has been recorded, with a high dominance of mollusks, besides other species of cnidarians, flatworms, crustaceans, annelids and echinoderms. Seasonal variations were high, with a higher number of species and higher abundance in autumn season. 30 species have been found in spring and 67 in autumn. Algal coverage seems to play an important role for the species composition and abundance of zoobenthos in Radhima coast. Stability of zoobenthic community was low and this situation may be related to the high human impact in the recent years, vegetal cover and substrate typology.

MİNİMUM LİMİT DETECTİON OF RHODAMİNE WT AND SRG EXTRA BY SYNCHRONOUS SCAN METHOD

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Some fluorescent dyes, after been injected as artificial tracer in one water system, have to be measured in all collected water samples in different points of this system. The aim of this study is to detect the minimum limit of these dyes in water samples by spectral measurements. Only spectral determinations of Rhodamine WT and Sulforhodamine G (SRG) Extra in their standard solutions (solvent: distilled water) are described in this paper. Synchronous scan methods were used for the detections and measurement of dyes fluorescence by the means of a Perkin Elmer Luminescence Spectrometer LS 55. According to obtained results, the minimum limit of concentration that can be detected in water samples is respectively: Rhodamine WT 0.0025 ppb and Sulforhodamine G Extra 0.001- 0.002 ppb.

EVALUATION OF ACUGA (*ENCHRAULIS ENCHRASICHOLUS*) POPULATION STRUCTURE BY LENGTH AND AGE INDICATORS

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Açuga (Enchraulis enchrasicholus), a member of small pelagic fish group in the waters of the Mediterranean and Adriatic Sea with important economic value for all regional countries, including Albania.

The purpose of this study was to define the age of açuga, as one of the important indicators for the assessment of fishing reserves. Age evaluation based on sagital otoliths, found in the inner ear of the fish.

The study was conducted at the Research Institute of Fishery in Durres, in the period January 2008 - December 2010. During this time, 863 fish were analyzed. For each individual was kept records for weight and height then, otoliths were removed, and finally watched in stereomikroskop (40 X) annual assessment circles around the otoliths opaque core. Age of fish is equal to the number of annual rings.

The study showed that the age average was 2.22 year, and 70% were 2+ and 3+ years. The average length was 13.98 cm. About 58% of sardines were with length 12.5 - 15 cm. This study will help determine the population dynamics of anchovy fish and more accurate predictions for the amount of fish to hunt in defined time periods

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TASTE AND ODOR EPISODES IN WATER OF BOVILLA RESERVOIR USED FOR THE WATER SUPPLY OF TIRANA

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Bovilla Reservoir is one of the major hidrotechnical works of Albania. The reservoir was filled for the first time on 20.05.1998 and since 1999 has been used for the drinking water supply of Tirana, the capital city of Albania. This reservoir, from autumn 2001 repeatedly manifest an unpleasant taste and odor witch the drinking water treatment plant has been able to remove by using advanced treatment techniques such as treatment with powdered activated carbon. Microorganisms living in surface waters can cause unpleasant tastes and odors. Actinomycetes can produce considerable amounts of the earthy-musty odor compounds geosmin and methylisoborneol (MIB). These filamentous bacteria are found in both terrestrial and aquatic environments and are particularly abundant in soil. Odor compounds produced terrestrially may be washed in the reservoir causing taste and odor outbreaks. Throughout the 21- month monitoring period, raw water samples were collected and analyzed for the number of actinomycetes and some reservoir parameters. The relationships between actinomycetes number and characteristics such as flavor threshold number (FTN), chemical parameters, microbiological parameters and water level of the reservoir were investigated. Actinomycetes

were found to correlate closely with the flavor threshold number and microbiological parameters.

CONSIDERING IMPORTANCE OF LIGHT IN THE POST-BYZANTINE CHURCH IN CENTRAL ALBANIA

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The subject of this paper is application of coloring and lighting parameters as principals in well functioning of an important religious monument from the Byzantine and post byzantine periods in central Albania. The aim of the paper is to consider how the twelve-fifteen-century constructors of the Saint Mary church close to Lushnja city in village Bishqethem optically manipulated the visual space of the naves, through the particular use of light. The paper is discussing upon the points of the orientation of the main axis of the Saint Mary church that is correlated with astronomical paths and interaction between sunlight and church space itself. We try to discuss not only the fact of light as a symbolic role, but also its environmental implications in terms of surviving and existence.

The survey will serve as an important example and approach to analyze other structures and architecture examples and contributing through integrated environmental approaches in conservation and revitalization.

IN WHAT LEVEL IS THE WATER QUALITY OF OHRID LAKE (ALBANIAN PART) COMPARED TO THE INTERNATIONAL STANDARDS ?

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There are many studies on Ohrid Lake, particularly these three last decades. Some of them are focused on the coliform pollution. The increase of the inhabitant's number in the area around the Lake is followed by the different kind of pollution particularly in the Albanian littoral. The discharge of the wastewater of Pogradec city into the lake without treatment was the main cause of the high coliform pollution level until 2009. The wastewater treatment plant of Pogradec city started to function partially four years ago (2009). It is situated around 5 km far from Pogradec City. The goal of this paper is to evaluate the quality of the wastewater of Pogradec city before entering Ohrid Lake after its treatment. In order to achieve that, some physico-chemical and bacteriological analyses were carried out in 2011 and 2013. Some data about diluted oxygen, conductivity, temperature, pH and total coliforms are presented in this paper. The comparison of these data with international standards shows that some of them are comparable, but some others are higher.

SPAWNING OF SARDINE, *Sardina pilchardus* (Walb.) IN BOKA KOTORSKA BAY (SOUTH ADRIATIC SEA)

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The present study analyzes spatial distribution of sardine *Sardina pilchardus* (Walb., 1792) eggs and larvae and macroscopic maturity data from biological samples. These data are used to describe the spawning intensity of sardine in Boka Kotorska Bay. Ichthyoplankton samples were collected using Calvet (modified PairOVET) plankton net at 18 positions in December 2006 and April 2007, while reproductive characteristic of sardine were determined from samples collected on a monthly basis in the period from July 2006 to October 2007 using beach seines with minimum mesh size of 8 mm. The lowest values of gonadosomatic index (GSI) were found in June, July and August, corresponding to the state of gonad rest. The GSI increased gradually from September and October and reached the highest values in February, of 5.22 for females and 6.58 for males. Diameters of sardine eggs were in range from 1.29 to 1.66 mm, oil drop between 0.09 to 0.17 mm, while total length of larvae ranged from 2.85 to 5.01 mm, with the highest abundance in Kotor bay. The intensity of sardine spawning was calculated in accordance with the methodology that gives Karlovac (1964) for the area of the central Adriatic Sea.

NEW MEMBERS OF THE ZAPADNA MORAVA RIVER ICHTHYOFAUNA (SERBIA)

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The Zapadna Morava River (298km in length) is a major tributary of the Danube in the Republic of Serbia. The ichthyological research conducted in 2010-2012 on a number of Zapadna Morava and Međuvršje Reservoir profiles revealed the presence of 28 fish species belonging to 9 families. A marked qualitative and quantitative predominance (18 species and more than 90% of samples, respectively) of representatives of the family Cyprinidae was observed. As compared to the 1996-2002 ichthyofaunal records, 3 new species - *Gymnocephalus cernus* (Percidae) and alien *Neogobius fluviatilis* (Gobiidae) and *Hypophthalmichthys molitrix* (Cyprinidae) - were observed. The occurrence of *G. cernus* and *N. fluviatilis* in the new habitat is most likely the result of spontaneous expansion of their range, whereas the record of *H.molitrix* in the Međuvršje profile is due to the undesirable introduction and successful acclimatisation of this species during planned *Cyprinus carpio* fry stocking activity. The populations of some indigenous species such as *Zingel zingel* and *Tinca tinca* are highly thinned, facing extinction in the ecosystem analysed. These facts, along with the reduced numbers of predators, suggest deterioration in the ichthyofaunal structure of the water body.

IDENTIFICATION OF BACTERIAL OPPORTUNISTIC SPECIES THROUGH THE USAGE OF BIOCHEMICAL SYSTEMS API 20 E AND ENTEROPLURI AT SHKODRA/SKADAR LAKE

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Physico-chemical and microbiological characteristics of the watershed of the lake Shkodra/Skadar are not only affected by anthropogenic pollutions, but it is worth mentioning that the purity of surface waters and groundwaters of Lake Shkodra/Skadar are closely connected with the change of weather conditions, which are associated with the increased runoff of streams and rivers that flow into the lake, especially in spring and fall season, increased rainfalls, snow, erosion phenomenon, flooding, etc. Lake Shkodra/Skadar watershed is exposed to various sources of pollutions, which are related with the discharge of waste waters, industrial and urban pollution, agricultural activities etc. This study provides an assessment on qualitative analysis by biochemical tests API 20 E and Enteropluri enabled the identification of different species opportunistic pathogens in water obtained in the study. Using biochemical tests API 20 E and Enteropluri constitute an innovation in defining opportunistic pathogenic species. This study was conducted at the Microbiological Diagnostical Center "Wolfdieter Sixl", at the University of Shkodra "Luigj Gurakuqi".

AN EVALUATION OF ORGANCHLORINATED POLLUTANTS IN CENTRAL ALBANIA

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This study examines the levels of organochlorine pesticides and polychlorinated biphenyls in butter samples collected in central Albania (Tirana-Durres-F. Kruja). It was found that butter was suitable for the monitoring of the different classes of chlorinated hydrocarbons; such are organochlorine pesticides (OCPs), polychlorinated biphenyls (PCBs) and dioxins in the environment. Pollutant levels present in butter may indicate the occurrence of these contaminants in pastureland, and thus provide a useful environmental indicator of fluxes to pastures. These would have principally human factors although there are also other possible sources of contamination to pastures such as atmospheric component, a water-based contribution from irrigation or periodic flooding for animals on flood plains, and animal feed. Ultrasonic bath extraction assisted with n-Hexane/Dichloromethane mixture and clean-up procedures have been used for analytical treatment of samples. The quantitative analysis of organochlorines was performed by the gas chromatography method with electron capture detector (GC-ECD). The organchlorine pesticides detected were HCHs (alfa-, beta-, gama- and delta-isomers) and the DDT-related chemicals (o,p-DDE, p,p-DDE, p,p-DDD and p,p-DDT). Analysis of PCBs was based on the determination of the seven PCB markers (IUPAC Nr. 28, 52, 101, 118, 138, 153 and 180). Less chlorinated PCB congeners were found in

higher concentrations in all samples. The levels of contaminants observed for the butter samples correlate with economic factors such as agricultural factors, industrialization data or don't manage of waste repositories of pesticides for the corresponding regions. The results of surveillance on chlorinated pollutants are interpreted using Cluster statistical method.

ASSESSMENT OF POTENTIAL HAZARDS OF BIOGENIC METAL NANOPARTICLES TO AQUATIC PLANTS

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The rapid development of nanotechnology is far ahead of nano assess the impact on the environment. Studies on the effect of nanomaterials which can come in natural bodies of water with the waste water industry, it is necessary to assess their potential hazard to aquatic ecosystems. The effect of colloidal solutions of biogenic metal nanoparticles were obtained from dispersion metals granules by impulse of electric current with amplitude 100-2000 A in water (at concentrations of Mn – 1,51 mg / l, Fe – 1,32 mg / l, Cu – 0,75 mg / l, Zn – 0, 89 mg / l) on the morphology, growth, reproduction and cytophysiological processes of pleustophytes (*Limnobium stoloniferum (GFW Meyer) Grisebach* and *Lemna minor L.*) has been studied. It is shown a stimulating effect of nanoparticles of Fe, Mn, Fe, Mn and an inhibiting effect of Zn, Cu, ZnCu and Ag. A comparative assessment of the impact of metal nanoparticles and metals in ionic form on the example of Cu and Zn. Ions Zn2 + and Cu 2 + at low concentrations stimulated intracellular physiological processes, growth, development and reproduction of plants, while high concentrations inhibited this processes, it been conducted and it is shown that the effect of these nanoparticles Zn and Cu similar to the effect of ultrahigh concentration of metal in ionic form.

INVESTIGATIONS OF THE LOADING RATE IN THE COURSE OF RIVER VELGOSHKA AND ITS INFLUENCE ON THE TROPHIC STATE OF LAKE OHRID

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In the last several decades oligotrophic Lake Ohrid was not exempted from the general tendency of the enhanced anthropogenic influence. Especially large negative impact on the littoral zone of Lake Ohrid has River Velgoshka.

River Velgoshka is a shallow river with a small amount of water and a small flow. It has a larger amount of water only in the period of snow thaw and at a larger amount of rainfalls.

With aim to determine the loading rate in the separate points of River Velgoshka flow from its spring to inflow in Lake Ohrid in the region "Grashnica" were carried out investigations of physic-chemical, microbial and phytoplankton analysis of the water.

The results from all the investigated parameters indicate how the load moves along the River Velgoshka. Values significantly increase at the point Voska, which is the most loaded locality and the river water has the worst quality. After the river inflow into the lake at

the point Grashnica, values decline due to river mixing with lake water. From this it is concluded that River Velgoshka has a strong negative influence on the water trophic state of Lake Ohrid in the littoral area Grashnica where it inflows.

TOLERANCE OF NAKED AMOEBAS TO THE ABIOTIC FACTORS OF WATER ENVIRONMENT

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The tolerance ranges of most distributed naked amoeba species to main abiotic factors were analyzed in the waters of Zhytomir and Volyn' parts of Ukrainian Poessje during the period from 2009 to 2012. As a result several ecological groups of naked amoebas were set. 6 species (*Korotnevella stella*, *Cochliopodium* sp.(1), *Vannella* (cf) *lata*, *Mayorella cantabrigiensis*, *Thecamoeba striata* and *Vahlkampfia* sp.(1)) were marked as eurythermal and registered in the temperature range from 3 to 26 °C. 8 species are stenothermal thermophilic which registered in the temperature range from 4 to 26 °C (*Deuteramoeba mycophaga*, *Saccamoeba stagnicola*, *Saccamoeba* sp.(1), *Saccamoeba* sp.(3), *Mayorella vespertilioides*, *Flamella* sp., *Vahlkampfia* sp.(2), *Mayorella* sp.(1) and *Vexillifera* sp.) whereas 3 species (*Saccamoeba* sp.(3), *Paradermamoeba valamo* and *Paradermamoeba levis*) are psychrophilic stenothermal which registered in the temperature range from 3 to 6 °C. The such species as *K. stella*, *Mayorella* sp.(1), *Vannella* (cf) *lata*, *Ripella* sp., *T. striata*, *Vahlkampfia* sp.(1) and *Vahlkampfia* sp.(2)) are euryoxidic and observed in oxygen concentrations from 1.37 mg/L to 31.94 mg/L. 8 amoebae species (*S. stagnicola*, *Saccamoeba* sp.(1), *Korotnevella* sp.(2), *Vexillifera* sp., *M. cantabrigiensis*, *Stenamoeba stenopodia*, *Flamella* sp. and *Cochliopodium* sp.(1)) were observed under oxygen concentration in water no more than 18.32 mg/L and were classified as stenooxidic. 10 species (*K. stella*, *Korotnevella* sp.(2), *Vexillifera* sp., *M. cantabrigiensis, Vannella* (cf) *lata, Ripella* sp., *T. striata, Flamella* sp., *Cochliopodium* sp.(1) and *Vahlkampfia* sp.(1)) are marked under wide range of permanganate oxidability values (from 1.32 mg O_2/L to 56.5 mg O_2/L) and 5 species (*Mayorella* sp.(1), *S. stagnicola*, *Saccamoeba* sp.(1), *S. stenopodia* and *Vahlkampfia* sp.(2)) are marked in the narrow range of permanganate oxidability values (from 2.43 mg O_2/L to 38.03 mg O_2/L).

FLORISTIC AND CHOROLOGICAL NEWS FROM NORTHERN KOSOVO, IN THE IBAR RIVER VALLEY

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The terrains in the middle course of the Ibar valley were rarely visited and floristically investigated, as evidenced by scarce literature related to this part of Serbia. All the studies so

far have had a sporadic character of the research rather than an elaborate and exhaustive investigation and analysis. It was only with D. Prodanović and Z. Krivošej studies (2003) that a more detailed analysis of flora in this area began. The field investigations carried out continuously for 10 years, have led to the discovery of new taxa recorded for the first time in Kosovo and Metohija. This study presents new chronologial data for 4 floral species: *Laburnum alpinum* (Miller) Berchtold & J. Presl. (*Fabeceae*), *Epimedium alpinum* L. (*Berberidaceae*), *Bupleurum tenuissimum* L. (*Apiaceae*) and *Malus florentina* (Zuccagni) C.K. Schneid (*Rosaceae*). Updated literature and Internal database of Institute for Nature Conservation of Serbia were used to present and check an overall distribution of all studied taxa in Serbia. On the basis of relevant distribution data, all investigated species are mapped on 10x10 sq km at UTM grid system. The study of distribution of these four plant species provided useful information for better knowledge of their distribution pattern in Serbia.

GENERALISTS OR SPECIALISTS – DO TIGER BEETLES ADOPT THE SAME STRATEGY ACCORDING TO HABITAT TYPE IN DIFFERENT PART OF THE MEDITERRANEAN REGION?

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The Mediterranean Region is a one of the richest regions in Palaearctic according to species diversity of Cicindelidae. In this area more than 60 taxa of tiger beetles can be found, including some endemics. Unfortunately, for most of these species only some basic ecological data are known. The material used in this study was collected during eight "TB-Quest Expeditions" in the localities with the following species: *Calomera littoralis nemoralis*, *C. l. littoralis*, *C. fischeri fischeri*, *C. aulica aulica*, *Cephalota chiloleuca chiloleuca*, *C. circumdata circumdata*, *C. besseri*, *Cicindela campestris atlantis, C. c. campestris, C. monticola rumelica*, *C. m. albanica*, *C. maritima kirgizica*, *Cylindera germanica germanica, C. trisignata trisignata, C. t. hellenica*, *Myriochila melancholica melancholica* and *Megacephala euphratica euphratica*. The samples were collected in 187 study sites including 109 in the Balkan Peninsula and the north part of the Black Sea coast (Albania, Greece, Macedonia FYR, Montenegro, Romania, Bulgaria, Ukraine, and Moldova) and 78 in North Africa (Tunisia and Morocco). To reveal habitat preferences of tiger beetles the following environmental parameters were chosen: macrohabitat type (marine sandy beach, marine stony beach, bank of lake, bank of river, saltmarshes, oasis, ect.), pH, salinity, soil humidity, as well as soil granulometry. Among all studied tiger beetle species the most eurytopic taxa were: in Balkan Peninsula and on the Black Sea coast – *Calomera littoralis nemoralis* (which occupied all four macrohabitat types distinguished in the area) and in the Maghreb Region – *Calomera littoralis littoralis* and *Lophyra flexuosa flexuosa* (both occurred in three different types of habitat). All other 15 Cicindelidae taxa were restricted usually to single (or 2) types of macrohabitat. The CCA analysis of Cicindelidae microhabitat preferences (soil parameters) showed that most species preferred soils with predominance of dust, loam, or sand particles.

PLEISTOCENE SEA LEVELS AND PHYLOGEOGRAPHY OF *Calomera littoralis* IN MEDITERRANEAN

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The tiger beetle *Calomera littoralis* is one of the most common species among Cicindelidae occurring in southern Europe. It occurs on sea beaches, saltmarshes, as well as on river and lake banks. The aim of this study was to reveal the genetic structure of *C. littoralis* in the Mediterranean Region. The material was collected on 39 sapling sites during a few „TB-Quest Expeditions" in Ukraine, Moldova, Romania, Bulgaria, Albania, Macedonia FYR, Turkey, Greece and Montenegro. Beetles were caught using entomological hand net and preserved in 96% ethanol. The HCO and LCO universal primers were used to amplify part of COI gene (680 bp). As a result we obtained 142 sequences among which 74 haplotypes were defined. The phylogenetic analyses with using Maximum Likelihood and Neighbor-Joining methods resulted in dendrograms of same topology showing two well supported clades. The first clade grouped specimens collected in the Mediterranean and Black Seas regions while the second included only individuals from the Black Sea coast. The genetic distance (KP2) within clades was below 1% while among them it was 4%. Our results show that during the Pleistocene the population of *Calomera littoralis nemoralis* in the Mediterranean separated in the two above mentioned units. That was possibly caused by the lowered sea level and disappearance of accessible habitats joining the Mediterranean and the Black Sea coasts. Then, possibly during some of the past interglacials, the population from the Mediterranean colonized some regions of south-western Black Sea coast.

THE LONG-TERM CHANGES OF THE SOFT-BOTTOM ZOOBENTHOS AT COASTAL ZONE OF THE WESTERN CRIMEA (THE BLACK SEA)

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The long-term changes of zoobenthos at the Western coast of Crimea on depths 1–25 m were analyzed for the period 1950s–2000s. Within the period 1957–1985 the average biomass of zoobenthos was relatively invariable. Since 1985–1990 until the second half of the 1990s the increasing of average biomass was registered. So, within depth range 1–12 m the biomass increased from 280 (1985–1990) to 400 (1990–1995) and to 550 g/m^2 (1995–2000); at depths 13–25 m the average biomass altered from 190 to 400 and to 700 g/m^2, correspondingly. During the 1st decade of 2000s the decreasing of the average biomass was revealed. The similar trends of zoobenthos biomass in Sevastopol bay were observed. The peak of biomass in the 1990s can be related with mass development of filter-feeders and considerable domination in open coast of bivalve *Chamelea gallina*, and in the bay of bivalves *Cerastoderma glaucum*, *Mytilus galloprovincialis* and gastropod *Nassarius reticulatus*. At the peak in the 1990s the average biomass on the open coast was about 3–4 times higher than in the Sevastopol bay.

The presented results were obtained with the partial financial support of the PERSEUS EC Project No. 287600.

ANALYSIS OF THE DATA REGARDING THE RINGED BIRDS RECOVERED IN SOUTHWESTERN ROMANIA (DOLJ COUNTY)

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Our study synthesizes and analyzes scientific the data provided by 58 bird specimens marked with rings in 21 countries (from Europe, Africa and Asia) and recovered in southwestern Romania, Dolj county respectively. Birds under discussion originate from Hungary (14 specimens), Russia (7 specimens each), Ukraine (6 specimens), Italy (4 specimens), Finland, Serbia, Sweden (3 specimens each), Denmark, Lithuania, Poland, Slovakia (2 specimens each), Bulgaria, Czech Republic, Egypt, Germany, Norway, Romania, Senegal, Switzerland, Turkey, UK (1 specimen each).

In terms of ecological appurtenance, most species are aquatic, and belong to the following systematic orders: Pelecaniformes (*Phalacrocorax carbo, P. pygmaeus*), Ciconiiformes (*Nycticorax nycticorax, Ardea cinerea, Ciconia ciconia, C. nigra, Plegadis falcinellus, Platalea leucorodia*), Anseriformes (*Anas strepera, A. platyrhynchos, A. acuta, A. querquedula, Aythya fuligula*), Gruiformes (*Fulica atra*) and Charadriiformes (*Philomachus pugnax, Larus ridibundus, Rissa tridactyla, Sterna caspia, S. sandvicensis*). Non-aquatic species from our list belong to Galliformes (*Coturnix coturnix*) and Passeriformes (*Parus major*).

Generally, the recovery of the ringed birds was made in the wetlands from the neighbourhood of the watercourses, most being recorded in the Danube meadow. This fact demonstrates the importance of wetlands, especially those from the Danube Green Corridor as very favourable refuges for migratory bird populations, which move from nesting areas toward the wintering areas and vice versa.

MICROBILOGICAL INVESTIGATIONS IN THE PELAGIC ZONE OF LAKE OHRID

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In natural, undisturbed water ecosystems it is natural to find stable groups of interrelated microorganisms. Any imbalance introduced into such systems by external factors triggers immediate reaction of the microorganisms. Aim of these investigations was to determine vertical distribution, seasonal changes in the number of bacterioplankton and its qualitative composition in the Lake Ohrid. Samples were collected at monthly intervals from a vertical profile from the central pelagic region: 1m, 10m, 20m, 30m, 40m, 50m, 75m, 100m, 150m and 240m depth), of Lake Ohrid, far from littoral, during 2007-2009. The pelagial zone of Lake Ohrid occupies 4/5 of the lake's total surface area.The presence of some physiological groups of bacteria was analysed such as proteolytic, amilolytic, lipolytic, phosphomineralizing, heterothrophs, as well as the facultative oligotrophic bacteria. The obtained results from the research revealed that the presence and the composition of the microorganisms is space and season variable, depending on the abiotic and biotic factors.

Generally, the lake is in the category of clean waters with a domination of oligotrophic bacteria. Most bacteria hydrolysed proteins, lipids and starch. Phosphomineralizing bacteria were less numerous. The relatively low and unimportant quantity of all analyzed groups of bacteria indicate that the process of transformation of the organic material is rather slow. These results indicate of bacteriological saturated clean water which can be used for recreation and as drinking water.

BACTERIAL ASSESMENT OF GROUND WATER AT OHRID CITY

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Ground water is an important source of drinking water and mach of the world's population depends on this important natural resource for human consumption. The quality and purity of ground water has direct effect on human health.

Ground water is one of the main sources of drinking water in many household in Ohrid city. The present study was carried out to monitor the suitability of raw ground water for safe drinking purposes and to investigate the status of these sites for bacterial contaminations.

70 different localities of Ohrid city were investigated during 2011-2012. Samples were collected from the areas where people are using ground water for drinking purpose. Samples from each wells were assessed for total coliforms*, Escherichia coli*, enteroccocs and heterothrophic bacteria.

The results of this study revealed presence and significant increase in the concentration of indicator organisms only in the shallow wells (26 wells). Sewage disposal practices like soak pit system and septic tank near the bore wells are also contributing to increase in the bacterial contamination.

Thus the study reveals that shallow raw ground water is not safe for human consumption. In order to meet the potability of ground water it is recommended that continuous, effective treatment combined with constant monitoring is essential to ensure that it meets the standards of drinking water.

OCCURRENCE OF ENDEMIC ECHINODERMS IN THE BENTHIC COMMUNITIES ON SHELF OF THE MONTENEGRIN COAST

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This paper presents the results of research of echinoderms in the coastal waters of the Montenegrin coast. Collecting material was done by scuba diving and by trawl in the period 2006-2010. The results show that of the total number of echinoderm species recorded in benthic communities on the shelf of the Montenegro coast, the eleven species are Mediterranean endemics and two species are Mediterranean sub endemics.

UNIQUE ECOSYSTEMS OF EXTREME HABITATS: A CASE OF ATALASSOHALINE HYPERSALINE LAKES IN THE CRIMEA

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Unique biodiversity of extreme habitats is still poorly known. In the Crimea there are continental hypersaline lakes. They are in the calderas of the ancient mud volcanoes. Lakes are the sulfate type, small shallow with sharply changing water balance and salinity - from 15 to 410 g / l. In the summer they partially or completely dry up. Study of biodiversity of these lakes was begun in 2001. Biodiversity is not very high; the species composition varies greatly. Some species are in resting stages. Crustaceans are the largest and most diverse group of animals in the lakes. 12-year (2001-2013) studies showed that not less than 8 species of crustaceans (Anostraca, Cladocera, Ostracoda, Copepoda) inhabit lakes, including a rare species for Europe - *Artemia urmiana*. Usually no more than 2-3 species are present in a lake simultaneously; they can reach very high densities. Lakes are used by birds, including rare, endangered and listed in the Red books species for nesting, wintering, resting and feeding during migrations. Crustaceans are their main food. The Crimea occupies a cross-road position in the Afro-Eurasian waterbird flyway system. That's why the Crimean hypersaline lakes play more important than a regional role in conservation of bird diversity.

ECOLOGICAL CONSIDERATION IN SUSTAINABLE HYDROPOWER DEVELOPMENT IN ALBANIA: THE CASE OF ASHTA HYDRO POWER PLANT IN SHKODRA, ALBANIA

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Initial plans for the construction of the newest hydropower project (HPP) in Drini River were halted and the design thoroughly revisited once Albania passed new laws on environmental protection and environmental impact assessment.

The Ashta HPP will be the fourth and most downstream hydropower on the Drin River Cascade in northern Albania. The HPP was initially developed in the 70s known as Bushat HPP and some of the structures were built in the 1970s i.e. Spathara weir. The initial project included river diversion and would have seriously affected the ecological status of the Shkodra Lake (wildlife refuge shared by Albania and Montenegro) and transboundary Buna River. Environmentalists alerted the authorities and the World Bank (WB/IFC) who in 2006 revisited the design and developed an alternative that addressed the environmental concerns.
The new design envisages a smaller scale HPP which avoids both river diversion as well as impacts on the Shkodra Lake. An Environmental Impact Assessment was prepared for the project. An analysis of potential project sites was included in the EIA where the IFC was involved in the site selection. Compared with other alternatives, this project site was chosen as it (i) Keeps at a very minimum inundation of arable land, (ii) Has the shortest channel length, affecting merely a small part of the Drin River which is poorer and less valuable in habitats and biodiversity than other parts, (iii) does not affect Protected Areas and cultural/historic heritage sites, (iv) does not directly affect the Shkodra Lake ecosystem, (v)

does not affect the quantity and quality of underground water, (vi) respects international environmental standards for minimal ecological water release and introduction of a fish-pass. The impacts of Ashta HPP will be negligible compared with the impacts of existing larger dams and reservoirs upstream. With Ashta HPP the level of the Spathari reservoir will increase by 1.5 m, however mitigation measures will be in place to allow for fish migration and vegetation corridor. The Drin river body has been heavily modified due to human influence. The free flow regime of the river has been altered for decades, habitats were fragmented, and fish migration routes interrupted by upstream dams and the existing Spathari weir. The new Ashta HPP has put in place a mitigation plan that includes the construction of a fish pass, provisions for ecological water release, erosion reduction measures, and flood protection measures to allow for increased biological activity.

THE CURRENT SITUATION OF BIRD COLONIES IN THE DANUBE DELTA (ROMANIA)

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The present study was carried out between 2011-2013, when the bird colonies from central Danube Delta were monitored. The surveyed surface was of approximately 130,000 hectares. The results are reported here and they are meant to add to the investigations made by other ornithologists between 1959-1995 and 2001-2002.

Our objectives have been the qualitative and quantitative analysis of bird colonies in central Danube Delta, of their habitats, as well as estimating the human impact on bird life during mating season.

We identified mainly mixed colonies of *Phalacrocorax carbo*, *Phalacrocorax pygmeus*, *Ardea cinerea*, *Ardea purpurea*, *Ardeola ralloides*, *Egretta garzetta*, *Casmerodius albus*, *Nycticorax nycticorax*, *Platalea leucorodia*, *Plegadis falcinellus*, settled in the willows found along canals or those surrounding the lakes, as well as colonies of *Chlidonias hybridus*, *Chlidonias niger*, *Chidonias leucopterus*, asociate cu specii precum *Podiceps cristatus*, *Podiceps grisegena*, *Podiceps nigricollis*, *Larus ridibundus,* settled on the water surface. Colonies of *Corvus frugilegus* were also identified along canals, few of them in association with *Falco tinnunculus* and *Falco vespertinus*.

In comparison to results of previous studies, the number of nesting birds appears to have been reduced.

Our study indicates that mixed colonies prevail.

The species with the highest number of nesting birds identified in this study are *Phalacrocorax carbo* and *Chlidonias hybridus.*

We also noticed that the species of herons and cormorants use the same nesting sites year after year, whereas the species that nest on the water surface change both the location and the timing of egg laying according to the water level.

ESTIMATION OF OCCURRENCE AND SPATIAL DISTRIBUTION OF HEAVY METALS IN OHRID AND PRESPA LAKE, ALBANIA

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The occurrence and distribution of heavy metals in waters of Ohrid and Prespa lakes was investigated by means of their content determination in the water column. Different anthropogenic pressures, especially heavy metal originating from mining activities might have influenced the fragile equilibrium of the lake ecosystem. Heavy metal concentrations in water were investigated at selected sites of both lakes. A total of 19 samples of water have been collected and the dissolved fraction of metals such as Fe, Cd, Cr, Cu, Ni and Pb in the water column was determined using the GF-AAS technique. According to the results obtained, Fe (52.7-1.6 $\mu g.L^{-1}$), Cr (17.9-0.9 $\mu g.L^{-1}$) and Ni (12.2-3.6 $\mu g.L^{-1}$) were found in high content in the surface and bottom waters of Ohrid and Prespa lake, while the levels of Cd fall below the allowed limit of its content in surface water (*NIVA, 2000*). Compared to Ohrid lake, Prespa lake was characterized by a lower presence of heavy metals in its waters, especially for Fe, Ni and Cr. Apparent variations of metal content in different depths of each station were evident for Fe, Ni and Cr assuming that their dissolved fraction is very dependent of lake water factors such as redox potential, the presence of different ions as well as water stratification.

IMPLEMENTING THE EUROPEAN FISH INDEX (EFI) FOR ASSESSMENT OF THE STATE OF CENTRAL ALBANIAN RIVER SYSTEM

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This paper presents the results of implementation of European Fish Index (EFI) in assessing the state of central Albanian river system that includes several water bodies: Rivers Shkumbini, Erzeni, Devolli, Osumi and Langarica, a tributary of Vjosa. Along with implementation of method following the FAME program, we specifically compares the different approaches developed in other countries and further to that discuss advantages and disadvantages. Also in case of Albaia we tried to identify advances in the development of assessment methods, in time when country is planning to enter and follow the EU commitments. We do consider that in our case the major steps in case of method development, i.e. data requirements, identification of reference conditions, quantifying human pressures, selection of metrics, index calibration, index validation and practical way of method implementation. Following the Water Framework Directive (WFD) there is strong requirement for monitoring of fish fauna in rivers and other water bodies.

Following data analyses we develop an index for Albanian rivers (ARI) with priory advantages that ARI has been especially prepared for Albanian rivers and its possibility to indicate the human interventions, where other biological parameters are not so sensitive.

MAMMAL'S HUSBANDRY IN THE IV-XTH CENTURIES SETTLEMENTS FROM EASTERN ROMANIA

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The paper was realized on the study of seventeen faunal assemblages from Eastern Romania. Animal breeding was an essential activity for the inhabitants of IV-Xth centuries settlements in Romania; in the studied assemblages more than 95% represents the remains of domestic mammals. The identified domestic mammals are: cattle, sheep, goat, pig, horse and dog. As far as the number of remains and the minimum number of individuals are concerned, the prevailing domestic mammal in the investigated assemblages is cattle, excepting those at Udesti and Vararie, where pig is on the first place.

There have been identified two specialized breeding regions: one where the livestock was dominated by cattle and pig (the region with medium altitude in the Sub-Carpathians and hills), and other with cattle and sheep/goat (in the flat-land arid region with xerophile vegetation).

The correspondence analysis revealed the association of domestic species in assemblages: one significant cluster is represented by Udesti, Malesti and Vararie where the most bones of pig were identified and other cluster is represented by Ghilanesti, Barlalesti, Nicolina and Gara Banca (9th-10th centuries) where the presence of horse is higher than other assemblages.

This work was supported by the Romanian grant CNCS – UEFISCDI project number PN-II-RU-TE-2011-3-0146.

DIVERSITY OF THE WILD MAMMALS, HUNTED IN THE BRONZE AGES SETTLEMENTS ON THE ROMANIA`S TERRITORY

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This study represents a synthesis based on the archaeozoological data concerning the Bronze Ages settlements on Romania`s territory. Wild mammal remains are described in terms of their frequencies based on the number of identified specimens. The identified species are discussed in relation to their ecological characteristics. Archaeozoological results show generally a low proportion of wild mammals. The most frequent species, such as *Cervus elaphus*, *Sus scrofa*, *Capreolus capreolus*, are present in the majority of the assemblages.

From the ecological point of view, the list of hunted mammals suggests the exploitation of a certain biotope: the forest (*Cervus elaphus*, *Sus scrofa, Ursus arctos, Capreolus capreolus, Lynx lynx, Canis Lupus, Bison bonasus, Martes martes*), species of open spaces (*Lepus europaeus, Bos primigenius*), aquatic species (*Castor fiber* and *Lutra lutra*) and eurytope species (*Vulpes vulpes, Meles meles*).

Two species now extinct, *Bos primigenius* and *Castor fiber* were archaeozoologically identified. *Cervus elaphus* and *Ursus arctos* considered as present day Carpathian, appear in this period with a large distribution and a high frequency on the Romania`s territory. *Alces alces* represents an animal probably arrived during its hibernal migration, from the north-east.

This work was supported by the Romanian grant CNCS – UEFISCDI project number PN-II-RU-TE-2011-3-0146.

DYNAMIC OF THE POPULATION OF THE PRESPA BELVICA *Alburnus prespensis* -Karaman 1924 FROM LAKE PRESPA

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The aim of investigation in this paper is the dynamic of the population of prespa belvica, *Alburnus prespensis* - Karaman 1924, which is endemic species in Lake Prespa. The investigations were performed in period of two year. The experimental fishing was made at night time with fishing nets with different sizes. The researches have been completed by using standard ichthyological methods.

For determination of the condition of prespa belvica *Alburnus prespensis* population were determinated: length composition, weight composition, sex and age composition of population. The length of individuals was measured with an ichthyological ruler, whereas the weight was measured with a digital scale with one decimal. The sex of individuals was determined by viewing gonads, whereas age was determined by microscope examination and reading of the scales.

Length composition of the population of *Alburnus prespensis* is composed of many length classes. Weight composition of population is also composed of many weight classes. Age composition of the population indicates that in the experimental fishery are representatives of all age classes which are a good indication that the population is in a proper age structure. Sex composition of the population is different in each individual sample and sex structure depends on the season and location of experimental fishing.

The received results show that the population of the prespa belvica *Alburnus prespensis* - Karaman 1924 from Lake Prespa is in very good condition.

PRELIMINARY RESEARCHES OF AQUATIC VEGETATION IN REED BEDS FROM LAKES PRESPA

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Lake Prespa is second big lake in R. Macedonia and it is situated in the south-western part of the country. The lake is divided into two parts: Macro and Micro Prespa.

Reed beds are present in littoral region of Lake Prespa close to the coastline. They have different function in the lake: serve as natural mechanical and biological filters as they clean the lake water of various organic and inorganic pollutants, represent a habitat, food, shelter and breeding site for many species of fishes and birds.

In this paper are presented preliminary researches of species composition of vegetation in reed beds from 3 localities from Lake Prespa: Asamati, Slivnica near Pretor - (Macro Prespa), and Zagradec (Micro Prespa). List of plant species has been based on data obtained during field surveys in course of summer 2010 and 2011.

Received results show that in the researched localities were evidenced total of 39 different plant species which belong to 20 families: 35 species - Zagradec, 31- Asamati, and 18 - Slivnica.

These differences in the number of plant species which are present in reed beds are result of different ecological conditions present in researched localities: configuration of the lake bottom, type of soil, level of nutrients, and others.

AQUATIC MACROPHYTES COMPOSITION IN LENTIC WATER BODIES – COMPARISON BETWEEN THE ECOREGIONS IN BULGARIA

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The diversity of the physical environment in Bulgaria determines the diversity of plant species. There are approximately 4102 species of vascular plants in Bulgaria of which the aquatic plants account for up to 9%.

The aim of this study is to collect and analyze the data about the biodiversity of vascular plants in the lentic water bodies. Up to now we have investigated 110 standing water bodies (lakes and reservoirs) situated at different altitudes, from sea level to 2535m a.s.l., and on the territories of the two ecoregions in Bulgaria (12-Pontic province and 7-Eastern Balkans). The accent of the study is put on reservoir macrophyte composition, as biological element for assessment of the ecological status of the water bodies. Sampling of macrophytes was carried out on at least 3 (3-8) transects of 50-100m situated around the perimeter of the water bodies between June 2009 and July 2013.

So far, 98 species of aquatic vascular plants were found, belonging to 65 genus and 41 families. Most of them are representatives of the families: Potamogetonaceae (10%), Cyperaceae (8%), Poaceae (6%), Alismataceae (5%), Polygonaceae (5%), Lemnaceae (4 %), Hydrocharitaceae (4%), Lamiaceae (4%), etc. There is no difference between the two ecoregions, according to the species encountered, except for *Isoetes lacustris* glacial relict (Pirin Mts. - Eastern Balkans) and *Sparganium angustifolium* (Pirin Mts., Rila Mts. - Eastern Balkans) and *Stratiotes aloides* restricted to Danube marshes and lakes (Pontic province).

Approximately 58% of the species encountered are helophytes, while the hydrophytes are 42%. Twelve species are protected by the state biodiversity act, sixteen are listed in the Red List of the vascular plants in Bulgaria, seven are in the Red book of Republic of Bulgaria, and three are included in the Bern Convention and one in the Habitat Directive.

Acknowledgment: Part of this study was financially support through Project № DO 02-341/2008 provided by National Science Fund at the Ministry of Education and Science.

COMPOSITION OF THE MACROZOOBENTHOS IN SEMI-MOUNTAINOUS RIVER IN SOUTH-WESTERN BULGARIA

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Senokoska River is a semi-mountainous river in south-western Bulgaria. The river is a left tributary of Struma River, but so far has not been a subject of investigation. The study represents the results from an investigation on the species composition of macrozoobenthos in the river. The research was performed at four sites along the river in the period 2009 – 2011. During the study a total of 113 macrozoobenthic taxa from 57 invertebrate families were found. Order Ephemeroptera is characterized with the highest number of taxa (24), followed by the orders Diptera (23), Plecoptera (22) and Trichoptera (13). Mayflies, stoneflies, caddisflies and true flies were established at all observed sites.

DECLINE OF THE OHRID TROUT POPULATIONS DUE TO LACK OF FISH STOCK MANAGEMENT AND OVERFISHING

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The main purpose of this paper is to describe the driving elements that are directly related to a reduction of trout harvest in the Lake Ohrid in the last two decades. Following different source of information it is clear that over fishing seems to be the major cause of the decline of the trout population, and therefore the controls on the number and size of fish must be implemented and coordinated on both sides of the lake, by the littoral countries. While several plants and projects are implemented, the declining fish populations in Lake Ohrid are a call for considering as a final urgent management priority. Further to that the conception of the lake as an integrated one, implementing the RBM practices and start with monitoring via WFD will be a set of further steps to secure the survival of the endemic trout population.

In the last two decades the landings in Albania increased dramatically, while those in Macedonia began to fall. The differences in fishing pressures in the two countries are the results of differences in the social and political situation and the fishing regulations in each country. According to local statistics the fish harvest has been reduced from 1995 and 2010 by 30% (from the 17 500 kg to 12 000 Kg) and that is directly reflecting the current state of the population in the lake.

GENETIC DIVERSITY AND EVOLUTIONARY HISTORY OF THE LAKE OHRID *Gammarus* SPECIES FLOCK

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The ancient Lake Ohrid on the Balkan Peninsula is the oldest lake in Europe. Given the surface area of the lake and the adjusted endemicity rate, it seems to be the most diverse of all the worldwide ancient lake. From the animal endemics in this lake, gammarids are scarcely known in terms of their diversity and phylogenetic relationships. Partial DNA sequences of two mitochondrial genes; *coxI*, *16S rRNA* and the nuclear gene *28S rRNA* of the Ohridian endemic *Gammarus* species and other Balkan gammarids were analysed. Phylogenetic analyses showed that endemic *Gammarus* species comprise an ancient species flock, with *G. sketi* from the feeder springs being their sister taxon. Among the species inhabiting the lake, *G. solidus* and *G. salemaai* are morphologically and molecularly well defined. Contrasting, *G. ochridensis*, *G. parechiniformis*, *G. lychnidensis* and *G. stankokaramani* revealed high discrepancy between morphological and genetic data and neither of them form a monophyletic clade. Two novel mtDNA lineages were found within the lake, possibly constituting two new species. Molecular clock analysis showed that the split between *G. sketi* and the Ohridian species flock occurred ca. 5-7 Mya, whereas within the flock there were at least two intralacustrine radiations: one estimated at 2-3 Mya, possibly associated with the origin of the lake, and the second at ca. 1 Mya, caused by the lake water level fluctuations during Pleistocene. It appears that the Ohridian *Gammarus* species flock derives from one of the old lineages of *G. balcanicus* complex that originated during the Dinaric uplift (ca. 15 Mya) from an ancestor colonizing this part of the Balkans over Thethys/Parathetys regression. Among the *G. balcanicus* lineages, Ohridian species flock is nested within a Hellenic clade. It is closely affiliated to biota endemic for the watershed originated from Tertiary Dessarete Lake system and for areas of the upper Vardar and Crni Drin river systems.

COMPOSITION AND SEASONAL VARIATION OF PHYTOPLANKTON COMMUNITY UPSTREAM OF DEVOLLI RIVER (EASTERN ALBANIA)

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Phytoplankton composition and abundance at three selected stations upstream of Devolli River, Eastern Albania, were investigated seasonally during 2011. A total of 122 taxa were recorded, of which 44 species were common at all stations. Diatoms (Bacillariophyceae) were the dominant group with 80%, followed by green algae (Chlorophyceae) with 10%, blue-green algae (Cyanophyceae) with 8% and euglenoids (Euglenophyceae) with 2%. More than 45% of the identified species belong to the five genera *Cymbella*, *Fragilaria Navicula*, *Nitzschia* and *Scenedesmus*. There were a few species which showed high cell numbers and found at all stations investigated, such as *Achnanthidium minutissimum* (Kützing) Czarnecki,

Cyclotella meneghiniana Kützing, *Fragilaria crotonensis* Kitton, *Synedra ulna* (Nitzsch) Ehrenberg, *Chlorella vulgaris* Beyerinck and *Pediastrum boryanum* (Turpin) Meneghini. Highest species numbers were found at the first station. Cell counts were dominated by diatoms with two peaks during summer and autumn.

MORPHOLOGICAL – ANATOMICAL CHARACTERISTICS OF TWO COMMON JUNIPERS (JUNIPERUS COMMUNIS AND JUNIPERUS OXYCEDRUS) FROM THE AREA OF MOUNTAIN KOPAONIK

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This paper aims to explore the variety of anatomical and morphological characteristics of two different juniper species (*Juniperus communis, Juniperus oxycedrus*) from the area of Kopaonik mountain. Analysis specimens for the species *Juniperus communis* and *Juniperus oxycedrus* were collected from the altitude of 420 m and 1,420 m. This paper presents analysis of three morphological and sixteen anatomical characteristics of the mentioned species.

ECOLOGICAL DEPENDANCE OF BOTTOM MACROINVERTEBRATES FAUNA DISTRIBUTION IN TRNAVSKA RIVER, SERBIA

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Trnavska River belongs to hilly-mountainous ecosystem of Serbia, which is characterized by rocky and pebble bottom. Downstream of the river is under the influence of human activities and regulated by the concrete slabs down to the confluence into the Raska River. The river is relatively fast, but with low water quantity. The water is well aerated and the chemical analyzes indicate I class of quality. Saprobic index classifies water in the β-mezosaprobni degree. Under these conditions characteristic fauna of macroinvertebrata developed highlighted by 48 taxa from 10 groups. Insects were represented with 83% of taxa. The highest diversity had Trichoptera with 11 taxa. The temporal and spatial dynamics of macroinvertebrate fauna Trnavska River was determined. 28 taxa were found during the spring season, and 38 taxa in summer season. Macroinvertebrate community was represented with average 4025 individuals per season during 2012. The average number of individuals per site of the season-based reaserch was 402.5 Ind / m². There was 310 Ind / m² in spring

and 495 Ind / m² per site during the summer season. The highest abundance was determined with class Insecta with 67.08% of the total number of individuals.

THE DISTRIBUTION OF ASTACIDAE (DECAPODA) FAUNA IN KOSOVO AND METOHIJA, SERBIA

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Lot of regulatory monitoring programs has been conducted in Europe aiming protection and risk assessment of cryfish. In this sense, the paper presents data on the distribution of crayfish in Kosovo and Metohija. We analyzed data from the period of 1992-2012. Two of four species characteristic to the Republic of Serbia were found in Kosovo and Metohija: *Astacus astacus* and *Austropotamobius torrentium*. A total of 33 sites were investigated that have swept all three sea watersheds: the Adriatic, Aegean and Black Sea. The species *Astacus astacus* prefers lowland parts of aquatic ecosystems and mainly water of β-mezosaprobnog degree. The species *Austropotamobius torrentium* inhabits mountainous ecosystems with water ofoligo-beta mezosaprobnog degree.

MORPHOLOGICAL AND ENVIRONMENTAL CHARACTERIZATION OF POPULATION OF WHITE-CLAWED CRAYFISH – *Austropotamobius pallipes* (Lereboullet, 1858) IN BUNA RIVER

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Recent findings related to distribution of white-clawed crayfish – *Austropotamobius pallipes* (Lereboullet, 1858) show its distribution in Neretva river basin, which has also been confirmed with updated results of research of this species in river Buna ecosystem. In accordance with same quotations, population found in area of Bosnia and Herzegovina is characterised by variations in morphometric parameters (width and length of rostrum, length of cephalothorax etc.) (Trožić-Borovac, 2012). Having in mind that, pursuant Red List of Threatened Species, species *Austropotamobius pallipes* is marked as sensitive and rare species, all new research tasks related to white-clawed crayfish in river flows of B&H show the need for the protection with the aim to preserve population in our rivers. Although there are valuable findings in the work of colleague S. Trožić-Borovac about population of fresh water crayfish in BiH rivers, we do not have enough data on biology and exact distribution of white-clawed crayfish in river Buna. During the monitoring that lasted three months (June, July and August, 2012) we have confirmed, in river Buna, the presence of species *A. pallipes*

in fishing sample of 51 units (37 units female and 14 units male). All fished specimens have been determined with gender, weight and analysis of six morphometric characters.

PARASITE FAUNA OF ENDEMIC FISHES (*SALMO LETNICA* Karaman, 1924 and *SALMO OHRIDANUS* Steindachner 1892) FROM LAKE OHRID (MACEDONIA)

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Lake Ohrid is situated in the Ohrid valley and occupies the farthest southwest part of the Republic of Macedonia, while a smaller part of its surface belongs to the Republic of Albania. It belongs to the category of oligotrophic lakes. Lake Ohrid fish fauna is represented with 17 autochthonous species, among which 60% are endemic in terms of species or subspecies. Ten species are commercially important, priority being given to the two endemic and relic trout species - Ohrid trout (*Salmo letnica* Karaman 1924) and Belvica (*Salmo ohridanus* Steindachner 1892).

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

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

Parasitological examinations of the fishes from the Macedonian part of Lake Ohrid were made on 78 specimens of Ohrid`s trout (*Salmo letnica* Karaman, 1924), of which 59 fishes (75,64 %) were infected. We determined the presence of 4 parasite species in Ohrid`s trout (*Salmo letnica*): *Eubothrium crassum, Cyathocephalus truncatus, Proteocephalus neglectus* and *Pomphorhynchus laevis.*

Parasitological examinations of the fishes from the Macedonian part of Lake Ohrid were made on 125 specimens of the Ohrid's belvica (*Salmo ohridanus* Steindachner 1892), of which 68 fishes (54,40 %) were infected. We determined the presence of 6 parasite species in Ohrid`s belvica (*Salmo ochridanus*).

PARASITE FAUNA OF *CHONDROSTOMA NASUS* (LINNAEUS, 1758) FROM LAKE OHRID (MACEDONIA)

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During the parasitological investigations on *Chondrostoma nasus* from Lake Ohrid (Macedonia), 6 parasite species were found: *Myxobolus exiguus, Paradiplozoon homoion homoion, Caryophyllaeus laticeps, Bothriocephalus opsariichthydis, Ligula intestinalis* (plerocercoid) and *Lamproglena pulchella.* The total prevalence of infestation is 70,83% and the highest prevalence is of *Paradiplozoon homoion homoion* (found in 50,0% of nases). The

average intensity of infestation is 3,65, and the highest level is that of *Myxobolus exiguus* and *Paradiplozoon homoion homoion* (4,0). Findings of *Myxobolus exiguus, Bothriocephalus opsariichthydis* and *Lamproglena pulchella* represent first record for *Chondrostoma nasus* from Lake Ohrid. Among the parasite species found out in chub from the Lake Ohrid, the greatest pathological influence is associated with *Paradiplozoon homoion homoion, Caryophyllaeus laticeps, Bothriocephalus opsariichthydis, Ligula intestinalis* (plerocercoid) and *Lamproglena pulchella.*

FLORA OF SKADAR LAKE NATIONAL PARK

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This paper contains an overview of flora of Lake Skadar together with taxonomic, ecological and phytogeographic analysis.

Based on the literature data and through systematic field research in the area of Skadar Lake, a number of 1380 taxa in the range of species and subspecies, grouped in 137 families and 579 genera was registered.

The most abundant families were *Asteraceae* (*Compositae*) with 145 and *Poaceae* (*Gramineae*) with 144 taxa, followed by *Fabaceae* (*Leguminosae*) (108), *Lamaiceae* (*Labiatae*) (63), *Brassicaceae* (*Cruciferae*) (61), *Apiaceae* (*Umbelliferae*) (55), *Scrophulariaceae* (54) etc. The most numerous genera are *Trifolium* (30), *Carex* (23), *Euphorbia* (21), *Ranunculus* (18), *Veronica* (15), *Galium* (102), *Silene* (13), *Allium* (13), *Geranium* (12), *Verbascum* (12), *Vicia* (12), *Juncus* (11) etc.

The phytogeographical analysis of the the area has shown that the Mediterranean-Sub-Mediterranean area type is the most represented with 28,47 % taxa, followed by Eurasian area type (24,98 %). Further ordinance of the area types in the choroligical spectrum is: Cosmopolite (9,59 %), Mediterranean-Pontic (9,30 %), Southeuropean-Mountain (6,32 %), Middle-Eoropean (5,95 %), Holarctic (5,81 %), Pontic-SouthSiberian (0,58 %). Adventives represent 9,01 % of the flora.

The Biological spectrum of the investigated area is dominated by hemicriptophytes which represents 33,70 % of it; they are followed by terophytes (32,53 %). The high percentage of terophytes can be caused by the intensive influence of Mediterranean as well as strong anthropogenic influence. Geophytes are represented with (11,04 %). Further order in the biological spectrum is as follows: phanerophytes (9,44 %), chamephytes (5,88 %), hydrophytes (4,50 %), scandetophytes (2,18 %), parasitophytes (0,73 %).

RARE SPECIES OF INSECTS IN ANTHROPOGENIC ECOSYSTEMS

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The present study brings new data on diversity of insect fauna in anthropogenic ecosystems located near Galati (Romania). These ecosystems are positioned on the left bank of the Danube River, at the confluence with the Prut River, most practically on the southernmost

limit of The Natural Park of the Lower Prut Flood Plain and the western extremity of the Danube Delta Biosphere Reserve.

In the study area 192 species of insects were identified and 5 Orders belonging to: Odonata (14 species), Orthoptera (15 species), Hemiptera (51 species), Coleoptera (86 species) and Lepidoptera (26 species). 4 were identified as rare species, 3 of which are protected by law.

Lycaena dispar rutila Werneburg 1846, Fam. Lycaenidae*, Heteropterus morpheus morpheus* Pallas 1771, Fam. Hesperiidae*,* and *Gomphus flavipes* Charpentier 1825, Fam. Gomphidae are a strictly localized species in Romania included in both the lists of the Bern Convention and the Habitats Directive, Annex 2, 3A, 4A.

The paper also analyzes the human impact on these ecosystems and highlights the consequences of human activities on the populations of insects and their diversity.

Advances in Biospeleological studies of Balkan peninsula

A COMPREHENSIVE VALORIZATION OF MEGARA CAVE WITH A VIEW TO PRESERVATION AND PROTECTION

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Megara Cave is located in western part of Bjelašnica mountain system, in area of Preslica massive, above Lanište plateau. Morphologically, the cave is consisted of the main channel, 277 meters long, with two huge cave halls connected by channels. Biospeleological investigation of the cave started in the second half of the 19th century, when custodian of the National Museum of Bosnia and Herzegovina, Victor Apfelbeck, was described the first cave coleopteran in Bosnia and Herzegovina, *Leptoderus pygmaeus* (Apfelbeck, 1889), recently known as *Antroherpon pygmaeum pygmaeum* (Perraeu, 2000). Megara, as a type locality for five animal taxa, a habitat for at least 30 cave dweller taxa and an important paleontological *finding place* of the cave bear (*Ursus spelaeus* Rosenmüller & Heinroth, 1794) remains, has exceptional natural and historical importance. Unfortunately, this cave represents an example of barbarian devastation due to taking out remaining bones which requires its urgent conservation, suppression of further devastation and permanent monitoring.

The comprehensive approaches to the value assessment have included a complex biological, paleontological and geological considerations as well as knowledge of the economic/touristic potential of this cave. The objective of valorization, requested by the Municipality of Hadžići, was also exchanging experience related to the cave management between regional and local authorities, in order to develop a comprehensive approach to ensuring cave safety and conservation. The project aims were focused on achieving successful future management with the balance between the economic benefits from touristic activities and conservation of natural and cultural heritage.

RED BOOK OF CROATIAN CAVE FAUNA, A MODEL FOR A WHOLE DINARID REGION

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Red Book of Croatian cave fauna, published in 2009, include 186 taxa from 16 classes, 29 orders and 54 families. According to threat status, 70 taxa (37%) are vulnerable (VU), 60 critically endangered (CR) (35%) and 49 endangered (EN) (26%). For 2 taxa there are not sufficient data to determine the threat status (DD). Endemism of the cave fauna is highly pronounced, with 136 taxa endemic to Croatia (73%), mostly stenoendemic, widespread in very restricted range, and 47 taxa (25%) are endemic to the Dinaric area, distributed in other Dinaric countries, primarily Slovenia, Bosnia & Herzegovina and Montenegro. Only 3 taxa are not endemic to the Dinaric area. Relation between terrestrial and aquatic fauna shows that 109 taxa (60%) are terrestrial, while 77 taxa (40%) are aquatic, stygobiont fauna. Threats to

the cave fauna of the Dinaric ridge is detected, while include minor natural factors; periodic flooding, cave collapse, sediments filling, but most important are anthropogenic factors caused physical devastation and pollution of cave habitats. Areas important for the protection of Croatian cave fauna are also defined, same as protection measures. Red Book of Croatian cave fauna can be used as a model for a whole Dinarid region.

WATER MITES FROM PERCOLATING WATER OF CAVES FROM VIETNAM

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There is a complex and diverse aquatic community of microinvertebrates (dominantly represented by a rich crustacean fauna, especially copepods), which inhabit small fissures and cracks in the so-called vadose (or unsaturated) zone, i.e. the space between fossil cave galleries and the surface (Pipan 2004). However, the upper layer of this zone called the epikarstic zone (typically occurring in carbonate rocks such as limestone) traditionally has been neglected as the primary habitat for water mites. The groundwater fauna from Vietnam (and its karstic regions) is virtually unknown. A recent Italian speleological expedition carried out in the in Ha Giang region in northern Vietnam, collected several new blind water mite species from rimstone pools or other tiny collections of percolating water from several caves. Two new species of the genus *Torrenticola*, one new species of the genus *Africasia* and one new genus *Raptorhydracarus* gen. nov. representing a previously unknown limnesiid subfamily Raptorhydracarinae subfam. nov. will be decribed (Pešić & Gerecke in prep). Further, one new species, *Nilotonia sketi* Pešić sp. nov. was collected by a expedition carried out by Boris Sket and Peter Trontelj (Slovenia) in 2003 from percolating water of a cave in the World Heritage area of Vinh Ha Long (= Ha Long Bay) in northeastern Vietnam. Our study suggests that the abovementioned habitat can be treated as the primary one for these species. Probably more new species can be obtained from further investigations in pools of percolation water.

CONTRIBUTION OF EGON PRETNER (1896-1982) TO THE KNOWLEDGE OF THE SUBTERRANEAN BEETLES (COLEOPTERA) FAUNA OF MONTENEGRO

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Egon Pretner (1896-1982) was a Slovenian speleobiologist with reputation as one of the best experts on the Balkan subterranean beetles and caves. Present knowledge of the subterranean beetles (Coleoptera) fauna of Montenegro is mostly result of his hard-working and systematic field research. His first cave investigations in Montenegro dated in 1933 when he was army service as artillery officer. After World War II, he was employed at the Karst research institute in Postojna and he dedicated his life to cave beetles studies. He regularly organized

cave exploring excursions in late fifties, sixties and early seventies. His exemplary personal field research diary enables us to evaluate his work and to state that he made 287 cave visits in 154 different Montenegrin caves. After he has gathered published data and check cave beetle collections of his senior entomologists he prepared Subterranean beetle fauna of Montenegro overview, that was published as Montenegrin Academy of Science and Arts monograph in 1977. This and his other publications as well as extend collection are still the basic guide to the present day subterranean beetle studies in the Balkans.

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