ПЛОВДИВСКИ УНИВЕРСИТЕТ „ПАИСИЙ ХИЛЕНДАРСКИ”
БИОЛОГИЧЕСКИ ФАКУЛТЕТ • КАТЕДРА "ЕКОЛОГИЯ И ООС"
UNIVERSITY OF PLOVDIV, FACULTY OF BIOLOGY,
DEPARTMENT OF ECOLOGY AND ENVIRONMENTAL CONSERVATION

СЪЮЗ НА УЧЕНИТЕ В БЪЛГАРИЯ – ПЛОВДИВ
UNION OF SCIENTISTS IN BULGARIA - PLOVDIV

ВТОРА НАУЧНА КОНФЕРЕНЦИЯ ПО ЕКОЛОГИЯ

по повод 25 години от създаването на катедра
„Екология и опазване на околната среда”,
Биологически факултет, ПУ „Паисий Хилендарски”

ПРОГРАМА & РЕЗЮМЕТА

SECOND SCIENTIFIC CONFERENCE ON ECOLOGY

on the occasion of the 25 years anniversary of
Department of Ecology and Environmental Conservation,
Faculty of Biology, University of Plovdiv “Paisii Hilendarski”

PROGRAM & ABSTRACTS

1ви ноември 2013 г., Пловдив
November 1st 2013, Plovdiv

ПЛОВДИВСКИ УНИВЕРСИТЕТ „ПАИСИЙ ХИЛЕНДАРСКИ”
БИОЛОГИЧЕСКИ ФАКУЛТЕТ ● КАТЕДРА "ЕКОЛОГИЯ И ООС"
UNIVERSITY OF PLOVDIV, FACULTY OF BIOLOGY, DEPARTMENT OF ECOLOGY AND ENVIRONMENTAL CONSERVATION

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Assoc. Prof. Angel Tsekov, PhD
Assoc. Prof. Gana Gecheva, PhD
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Stela Stoyanova, PhD Student
Borislava Todorova
Bogdan Nikolov

Technical editor:
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FOREWORD

The Second Scientific Conference on Ecology is organized to commemorate the the 25th anniversary of the Department of Ecology and Environmental Conservation, Faculty of Biology, University of Plovdiv "Paisii Hilendarski". The conference will be held in Plovdiv (Bulgaria) on November 1st 2013. On November 2nd 2013 will follow the Fifth Student's Scientific Conference "Ecology – A Way of Thinking" 5 (for Bulgarian students and PhD students only).

The conference aims to provide an ideal platform for people to share research ideas and experiences in the fields of Ecology, Environmental Conservation and related areas. Traditionally the conference will be held in three thematic sections:

- *Ecology, Biodiversity and Conservation*
- *Ecological Monitoring and Applied ecology*
- *Ecological Education and Legislation*

Topics of interest include, but are not limited to: ecology and conservation of microorganisms, plants, aquatic and terrestrial animals, physiological ecology, behavioral ecology, population ecology, population genetics, community ecology, plant-animal interactions, ecosystem ecology, parasitology, animal evolution, ecological monitoring and bioindication, landscape and urban ecology, conservation ecology, ecotoxicology, marine biology, ecological education and legislation, as well as new methodical contributions in ecology.

Organizing committee

ВЪВЕДЕНИЕ

Втората юбилейна конференция по екология по повод 25 години от основаването на Катедра „Екология и ООС" към Биологически факултет, ПУ „Паисий Хилендарски", ще се проведе в гр. Пловдив на 01 ноември 2013 г. На 02 ноември 2013 г. ще продължи в Пета студентска научна конференция „Екологията – начин на мислене 5" (Само за български студенти и докторанти).

Целта на конференцията е да осигури възможност за обмен на идеи и постижения в областта на Екологията, Опазването на околната среда, Консервационната екология и други близки науки. Конференцията ще се проведе в три тематични секции:

- Екология, биоразнообразие и консервация;
- Екологичен мониторинг и приложна екология;
- Екологично образование и законодателство.

Област на изследванията: екология на животните, екология на растенията, екология на микроорганизмите, екология на екосистемите, физиологична екология, поведенческа екология, еволюционна екология, морска екология, екотоксикология, ландшафтна и градска екология, консервационна екология, паразитология, популационна екология, екологичен мониторинг и биоиндикация, както и нови методически приноси в екологията.

Организационен комитет

INTRODUCTION

The Department of Ecology and Environmental Conservation is a specialized structural link at the Faculty of Biology, University of Plovdiv "Paisii Hilendarski". Its main task is to organize and carry out educational, scientific and applicable activities in the field of ecology and environmental conservation.

The department carries out teaching courses for obtaining the educational-qualification degree “bachelor of science” of “Ecology and Environmental Conservation”, “Ecological biotechnologies”, “Biology”, “Medicinal Biology”, ‘Biology & Chemistry”, ‘Biology & Physics” and ‘Biology & English”, “master of science” of “Ecology and ecosystems conservation” , “Ecology of Aquatic Ecosystems and Aquaculture Production” and “Ecology, Management and Control of the Environment” and also PhD on “Ecology and conservation of the natural ecosystems”. The scientific production of the department is rich, various and purposeful by its content.

ПРЕДСТАВЯНЕ

Катедра „Екология и опазване на околната среда“ е специализирано структурно звено към Биологическия факултет на ПУ „Паисий Хилендарски“. Основната ѝ задача е да организира и провежда учебна, научно-изследователска и приложна дейност в областта на екологията и опазването на природата.

Катедрата организира и провежда обучение за придобиване на бакалавърска степен по „Екология и опазване на околната среда“, „Екология на биотехнологичните производства“, „Биология“, „Медицинска биология“, „Биология и химия“, „Биология и физика“, „Биология и английски език“; магистърска степен по „Екология и опазване на екосистемите“, “Екология на водни екосистеми и аквакултурни производства“, „Екология, управление и контрол на околната среда“; както и научната и образователна степен доктор по „Екология и опазване на природните екосистеми“. Научната продукция на катедрата е богата, разнообразна по форма и целенасочена по съдържание.

PROGRAM

9:00-10:00 – Registration

10:00-10:30 – Opening

10:30-10:45 – Coffee break

10:45-13:00 – Oral presentations

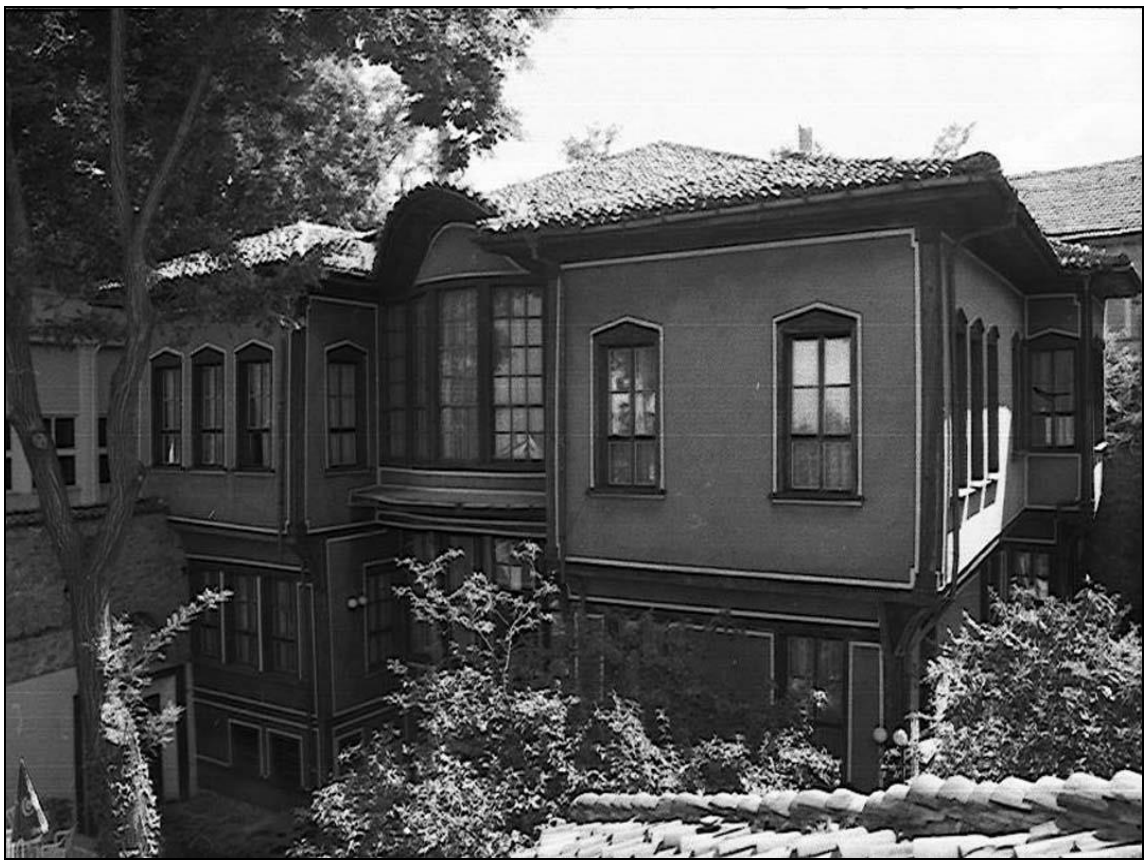
13:00-14:00 – Lunch break

14:00-15:15 – Oral presentations

15:15-15:30 – Coffee break

15:30-16:30 – Poster session

16:30 – Closing



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House of scientists – Plovdiv (Union of Scientists in Bulgaria – Plovdiv)

СЕКЦИЯ „ЕКОЛОГИЯ, БИОРАЗНООБРАЗИЕ И КОНСЕРВАЦИЯ”
SECTION “ECOLOGY, BIODIVERSITY AND CONSERVATION”

Председател: гл. ас. дбн Д. Георгиев / Chairman: Ch. Assist. Prof. D. Georgiev, DSc
Секретар: гл. ас. д-р И. Моллов / Secretary: Ch. Assist. Prof. I. Mollov, PhD

Доклади / Oral presentations

10:45-11:00	**Author(s):** Yordanka Hristeva, Gana Gecheva, Plamen Stoyanov, Rumen Mladenov, Detelina Belkinova, Ivanka Dimitrova-Dyulgerova, Yulian Marinov, Nuray Myumyunova **Title:** Bryophytes inventory in the Bulgarka Nature Park for the purposes of its Management Plan
11:00-11:15	**Author(s):** Dimitar Stoykov **Title:** Interesting lichenized fungi (Ascomycota) from Strouma valley and Mt Belasitsa
11:15-11:30	**Author(s):** Peter Genov, Atidje Ahmed **Title:** *Cicada orni* L. in the food of *Sus scrofa* L.
11:30-11:45	**Author(s):** Galya Petrova, Dimitar Djilianov, Michael Möller **Title:** Combination of molecular and morphological data does not support the existence of *Haberlea ferdinandi-coburgii* species
11:45-12:00	**Author(s):** I.Molla, E. Velizarova, B. Malcheva, V. Bogoev, Y. Hadzhieva **Title:** Forest fire impact on the soil carbon content and stock on the north slopes of Rila mountain
12:00-12:15	**Author(s):** B. Malcheva, E. Velizarova, M. Nustorova, V. Bogoev, I. Molla, H. Borisova **Title:** Microbial activity of forest fire-influenced soils from the north slopes of the Rila mountain (region of Dolna Bania)
12:15-12:30	**Author(s):** Alexander D. Dountchev **Title:** Challanges before the management and the protection of the spruce forest ecosystems in Vitosha Nature Park
12:30-12:45	**Author(s):** Ali Salehi, M.M Fallahchai, Gh. Mardalizad **Title:** Effect of soil physical properties on natural regeneration of *Populus caspica* Bornm. and *Alnus glutinosa* L. in North of Iran
12:45-13:00	**Author(s):** D.N. Das, Achom Darshan Singh, Rashmi Dutta **Title:** Biodiversity and conservation of Freshwater Fish of Arunachal Pradesh
14:00-14:15	**Author(s):** Çiğdem Gül, Murat Tosunoğlu **Title:** New Herpetofaunal Locality Records on the Bozcaada (Tenedos) and Ecological Observations

14:15-14:30	**Author(s):** Murat Tosunoğlu, Çiğdem Gül, İbrahim Uysal **Title:** Reptilies of Thrace Region in Turkey
14:30-14:45	**Author(s):** Doğanay Y. Yener **Title:** Urban Plant Diversity of humid regions in Istanbul
14:45-15:00	**Author(s):** Dilian G. Georgiev, Dimitar L. Kostov, Dimitar Y. Dimitrov, Rumyana V. Koleva **Title:** The molluscs of the medieval settlement at the village of Zlatna Livada (Bulgaria) with notes on the landscape dominated the area
15:00-15:15	**Author(s):** Raymond Tilmans **Title:** A bridge too far? The limits in mitigation when should nature overrule economy and avoidance replace mitigation?

Постерна сесия (15:30 ч.) / Poster session (15:30 pm)

1	**Author(s):** Hamit Ayberk, Selim Bayraktar **Title:** Butterfly Gardening
2	**Author(s):** Maria Lacheva **Title:** New data about Agaricales in Bulgaria
3	**Author(s):** Maria Lacheva **Title:** A study of macromycetes in Boraka Reserve, Central Rhodopes Mts
4	**Author(s):** Arezou Sadeghi, Ali Salehi, Abdollah Mousavi **Title:** Variations of Soil Nutrient Elements in Mixed Cultivation of Poplar and Peanut (Case Study: North of Iran)
5	**Author(s):** Sepide Sadat Ebrahimi, Hasan Pourbabaei, Javad Torkaman, Ali Omidi **Title:**
6	**Author(s):** Katya Uzundzhalieva, Ruska Ruseva **Title:** In situ and in vitro conservation of *Glicyrrhiza glabra* L. – Crop Wild Relative from Fabaceae
7	**Author(s):** Kolsum Shabaninejad, Ali Salehi, Hasan Pourbabaei, Sayyed Paiman Misaghi **Title:** Diversity of herbaceous species in upland areas of Caspian forests in Iran
8	**Author(s):** Daniella Ivanova, Rayna Natcheva **Title:** Conservation management of two rare plant species in Bulgaria
9	**Author(s):** Galya Petrova, Dimitar Djilianov, Ioannis Tsiripidis, Michael Möller **Title:** Molecular phylogenetics of *Haberlea rhodopensis* Friv. from different localities in Greece

10 **Author(s):** I. Semerdjieva, N. Piperkova, M. Zarkova, A. Nikolova
Title: Anatomical changes in Peach leaves infected by *Taphrina deformans* (Berk.) Tul.

11 **Author(s):** Dimitar Peev, Svetlana Bancheva, Rayna Natcheva, Vladimir Vladimirov, Malina Delcheva, Stoyan Stoyanov, Nikolay Velev, Daniela Ivanova, Valentina Goranova, Natalia Valyovska, Hristo Pedashenko
Title: In situ and Ex situ Conservation of Rare Plants in the Bulgarian Flora

12 **Author(s):** Tancho Agushev
Title: Preliminary Results of Species Composition and Dinamics of Family Culicidae (Insecta: Diptera) in Plovdiv city

13 **Author(s):** Zlatka M. Dimitrova, Margarita H. Marinova
Title: Study on the morphology of *Acanthocephalus ranae* from *Rana ridibunda* in Bulgaria

14 **Author(s):** Doğanay Y. Yener
Title: An Ecological Evaluation About The Woody Plant Hardiness (A Case Study of Rural Areas in Istanbul)

15 **Author(s):** Diana Ganeva, Ivan Ivanov
Title: Species composition and zoogeographical aspects of the Central Balkan Mountain tabanid fauna

16 **Author(s):** Stoyan Stoyanov, Valentina Goranova
Title: In situ Conservation of *Bupleurum uechtritzianum* S. Stoyanov (Apiaceae) in Bulgaria

17 **Author(s):** Dimitar Peev, Natalia Valyovska
Title: Vascular flora – protection capacity of the Northern Black sea coast in Bulgaria

18 **Author(s):** Milena Nikolova, Natalia Valyovska, Dimitar Peev
Title: New information about polyphenols of wild (*A. webbii*) and cultivated (*A. communis*) almonds from southwestern Bulgaria

19 **Author(s):** Siyka O. Nikolova, Cvetomir M. Denchev, Adriana Atanassova, Helmut Mayrhofer
Title: Occurrence of *Buellia aethalea* and *B. griseovirens* (lichenized ascomycetes, Physciaceae s. lat.) in Bulgaria

20 **Author(s):** Melania M. Gyosheva, Dimitar Y. Stoykov, Julian A. Marinov
Title: Larger basidiomycetes and lichenized fungi of conservation value in Balgarka Nature Park in Central Balkan (Shipchenska and Trevnenska mountains)

21 **Author(s):** Tania Hubenova, Eliza Uzunova, Penka Vasileva
Title: A case of ovotestis in the barbel *B. cyclolepis* from Maritza River

22 **Author(s):** Plamen Stoyanov, Ivanka Teneva, Rumen Mladenov, Detelina Belkinova
Title: Diversity and Ecology of Filamentous Blue-Green Algae in Bulgarian Standing Water

СЕКЦИЯ „ЕКОЛОГИЧЕН МОНИТОРИНГ И ПРИЛОЖНА ЕКОЛОГИЯ”
SECTION “ECOLOGICAL MONITORING AND APPLIED ECOLOGY”

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Секретар: гл. ас. д-р С. Петрова / Secretary: Ch. Assist. Prof. S. Petrova, PhD

Доклади / Oral presentations

10:45-11:00	**Author(s):** Nurcihan Hacioğlu **Title:** Physico-Chemical and Bacterial Characteristics of Surface Water of Saricay Stream (Canakkale/Turkey)
11:00-11:15	**Author(s):** K. Todorova, I.Velcheva, S. Petrova, E.Georgieva **Title:** Effect of Heavy Metals on Survival and Oxygen Uptake in Carp
11:15-11:30	**Author(s):** G. Gecheva, L. Yurukova, A. Cholakova, S. Mladenova **Title:** Heavy metal monitoring in river water and sediments
11:30-11:45	**Author(s):** Petya Dimitrova, Vesela Cvetanova, Iliana Velcheva, Gana Gecheva, Marin Marinov, Irina Karadjova **Title:** Monitoring of Priority Substances and Specific Pollutants in Maritsa River
11:45-12:00	**Author(s):** L. Yurukova, G. Gecheva **Title:** Some `hot spots` atmospheric assessment with mosses in Bulgaria
12:00-12:15	**Author(s):** S. Petrova, E. Valcheva, I. Chutrova **Title:** Effect of urban air pollution on deciduous tree species (Plovdiv, Bulgaria)
12:15-12:30	**Author(s):** Iliya Zhelev, Ivanka Dimitrova-Dyulgerova, Detelina Belkinova, Rumen Mladenov **Title:** Content of phenolic compounds in the genus *Carduus* from Bulgaria
12:30-12:45	**Author(s):** Nikolay Takuchev, Slaveya Petrova, Ivanka Dimitrova **Title:** Dispersion modeling of air pollution emitted from traffic in the transport tunnel under the Old Town of Plovdiv
12:45-13:00	**Author(s):** Svitlana Zadyra **Title:** Biochemical changes of an organism of *Apodemus flavicollis* (Rodentia: Muridae) under conditions of environmental anthropogenic pollution by heavy metals in northern areas of Ukraine
14:00-14:15	**Author(s):** Silviya Radanova **Title:** Plant succession in post fire communities of *Pinus nigra* Arn.
14:15-14:30	**Author(s):** G. Letchov, P. Dermendjiev, A. Aladjadjiyan. **Title:** A Remote Sensing of Leaf Biomass Production by Rhodope Mountains Deciduous Forest

Author(s): Yordan V. Dimitrov

14:30-14:45 **Title:** Sustainable management of the catchment area of the dam - adaptation for floods, droughts and poor water quality

Author(s): Georgi Dudin, Gana Gecheva

14:45-15:00 **Title:** Assessing River Hydromorphology with Macrophyte-based Metrics

Постерна сесия (15:30 ч.) / Poster session (15:30 pm)

23 **Author(s):** Nurşen Çördük, Nihan Akinci, Gülru Yücel, Nergis Kaya, Cüneyt Aki
Title: Genotoxic Effects of Dodine (1-Dodecylguanidium Acetate) on Root Cells of *Allium cepa*

24 **Author(s):** Tzenka Radoukova,Yovko Dyulgerski
Title: Study the impact of climatic conditions on Bulgaria Agricultural biological indicators of Burley tobacco varieties University

25 **Author(s):** Yovko Dyulgerski, Tzenka Radoukova
Title: Comparative study of the influence of climatic conditions on biological, economical and chemical indicators of samples Large-leaf Tobaccos of varietal groups Burley and Virginia

26 **Author(s):** I.Koleva-Lizama, B. Lizama Rivas
Title: Rivas Study on the Heating Degree Days in Several Cities of Bulgaria

27 **Author(s):** Berrak Damla Yağan
Title: An Invesitigation on Antioxidant Activity of Methanol Extract of Three *Hypericum* L. Taxa Leaves Naturally Distrubuted on Ida (Çanakkale-Turkey) Mountain

28 **Author(s):** Berrak Damla Yağan
Title: An Investigation on Cytotoxic Effect of Different Aerial Parts of *Hypericum tetrapterum* Fries Naturally Distrubuted on Ida (Canakkale-Turkey) Mountain

29 **Author(s):** Bernardo Lizama Rivas
Title: Probability Distribution of Flood Flows in the Rivers of the South Eastern Part of Bulgaria

30 **Author(s):** Neslihan Demir, Selin Ertürk, Merve Balli, Esen Geren
Title: Seasonal Variation of Heavy Metal Bioaccumulation in The Tissues of *Ruditapes decussatus* from Cardak, Canakkale-Turkey

31 **Author(s):** Neslihan Demir, Didar Güzey, Deniz Çakmak
Title: Determination of Genotoxicity of Tunca River (Edirne-Turkey) Water and Sediment with Allium Test System

32 **Author(s):** Selin Ertürk, Merve Balli, Neslihan Demir, Esen Geren
Title: Metal Concentrations in Mantle Tissue of Some Aquatic Invertebrates from Umurbey, Canakkale-Turkey

33
Author(s): Merve Balli, Neslihan Demir, Selin Ertürk, Esen Geren
Title: Preliminary Investigation on Heavy Metal Pollution in *Pecten maximus* in the Dardanelles Bosphorus, Turkey

34
Author(s): Doychin I. Terziyski, Liliana D. Hadjinikolova, Angelina S. Ivanova, Roumen K. Kalchev
Title: Some chemical characteristics (Chemical composition) of sediments from carp fishponds exposed to different type of fertilization Bulgaria

35
Author(s): Snežana Branković, Radmila Glišić, Vera Đekić, Milun Jovanović
Title: The Concentration of Some Metals in Soil and Species *Helleborus multifidus* subsp. *serbicus* (Adamović) Merxm. & Podl. on One Serpentine Locality (Serbia)

36
Author(s): Julia Ilkova, Paraskeva Michailova, Keith White
Title: Genome instability of *Chironomus riparius* Mg. (Diptera, Chironomidae) from polluted water basins in Bulgaria

37
Author(s): Dafinka Ivanova
Title: Climate Chance: The Impact on Urban Climate in the Municipality of Plovdiv

38
Author(s): D. Mihaylova, Tsv. Prokopov, N. Mihalkov
Title: Hydrobiological investigation of the activated sludge from aeration tanks of cyclical type in WWTP–Hisarya

39
Author(s): Tsv. Prokopov, D. Mihaylova, N. Mihalkov
Title: Biological treatment of wastewater in aeration tanks of cyclical type

40
Author(s): Anton Sotirov, Nikola Pistalov
Title: Using of composting for achieving of agricultural and environmental sustainability in Kyustendil region

41
Author(s): Anton Sotirov, Rositsa Vezenkova, Mihaela Yerusalimova, Siana Savova, Lachezar Stanchev, Tomas Rasulski
Title: Quality of the water of Novoselska River, intended of the future reservoir Kyustendil.

42
Author(s): Stefania Klayn, Diana Deyanova, Ioana Georgieva, Ventzislav Karamfilov
Title: Changes in the trophic structure of soft-sediment macrozoobenthic communities as an indicator for disturbance in coastal marine ecosystems in Sozopol Bay (south-western Black Sea)

43
Author(s): Diyan Georgiev, Evgeniy Raychev
Title: Bioaccumulation of heavy metals in the game in the region of Stara Zagora, South Bulgaria

44
Author(s): Georgi Zhelyazkov, Galin Nikolov, Alexander Atanasoff, Dian Georgiev, Lilko Dospatliev, Yordan Staykov
Title: Determination of Mineral Composition in Two Fish Species Roach (*Rutilus rutilus*) and Bleak (*Alburnus alburnus*)

45 **Author(s):** Angel Mario Dzhambov, Donka Dimitrova Dimitrova
Title: Green spaces in the surroundings of St. George University Hospital-Plovdiv as a subjective promoter for hospitalized patients' health – a pilot study

46 **Author(s):** Ekaterina Valcheva
Title: Environmental Problems with Solid Waste in Municipalities of 10 to 50 Thousand People

47 **Author(s):** G. Georgieva, E. Uzunova, T. Hubenova, Y. Uzunov
Title: Ecological Assessment of the Luda Jana River and Banska Luda Jana River Based on Selected Biological Parameters

48 **Author(s):** Daniela Krasteva-Malinova, Vencislava Vancheva, Ekaterina Valcheva
Title: Study the effects of sludges from pulp and paper industry on corn in laboratory experiments

СЕКЦИЯ „ЕКОЛОГИЧНО ОБРАЗОВАНИЕ И ЗАКОНОДАТЕЛСТВО”
SECTION “ECOLOGICAL EDUCATION AND LEGISLATION”

Председател: доц. д-р Д. Карагьозова / Chairman: Assoc. Prof. D. Karagyozova, PhD
Секретар: докторант С. Георгиева / Secretary: S. Georgieva, PhD student

Доклади / Oral presentations

10:45-11:00
Author(s): Hristina Bancheva
Title: Education for Sustainable Development in Bulgarian Parks

11:00-11:15
Author(s): Zlatka Vakleva
Title: Possibilities for Enrichment of Environmental Education with Environmental Aspects of Consumer Education

11:15-11:30
Author(s): Zlatka Vakleva
Title: Projections of Environmental Ethics in Environmental Education

11:30-11:45
Author(s): Margarita Panayotova, Zlatka Vakleva
Title: The Theme “The Food Contamination” in the Biological Preparation of Students

11:45-12:00
Author(s): Emilia G. Damianova, Maria Panchovska-Mocheva, Evelina I. Daskalova, Penka L. Vasileva
Title: Biosemiotics as a Possible New Paradigm in Theoretical Biology

Постерна сесия (15:30 ч.) / Poster session (15:30 pm)

49
Author(s): Kalina Kamarska, Antoaneta Angelacheva
Title: Knowledge and Attitudes Towards the Water in the 5th, 6th and 7th Grade Education

РЕЗЮМЕТА

ABSTRACTS

СЕКЦИЯ „ЕКОЛОГИЯ, БИОРАЗНООБРАЗИЕ И КОНСЕРВАЦИЯ”

SECTION “ECOLOGY, BIODIVERSITY AND CONSERVATION”

Bryophytes inventory in the Bulgarka Nature Park for the purposes of its Management Plan

Yordanka Hristeva, Gana Gecheva, Plamen Stoyanov, Rumen Mladenov, Detelina Belkinova, Ivanka Dimitrova-Dyulgerova, Yulian Marinov, Nuray Myumyunova

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Abstract. Bryophytes and their conservation status were studied in the Bulgarka Nature Park. The registered 50 species belonged to 19 families and 41 genera. Ten species were with conservation value; 2 were assessed as Data Deficient. Measures towards bryophyte flora conservation were proposed.

Interesting lichenized fungi (Ascomycota) from Strouma valley and Mt Belasitsa

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Abstract. During field work in the vicinities of Petrich (inkluding village regions of Mt Belasitsa) new data on several interesting or rare lichenized fungi were revealed. The finds of 9 species (Anaptychia crinalis, Cetraria isalandica, Cladonia ramulosa, Graphis scripta, Hypogymnia tubulosa, Lobaria pulmonaria, Physconia enteroxantha, Pyrenula nitida and Rinodina prina) were documented with digital photographs. All the specimens in dried form were housed at the Mycological Collection (SOMF) of the Institute of Biodiversity and Ecosystem Research (BAS, Sofia). One species traditionally included in the Red lists of many European countries - Lobaria pulmonaria was detected in several localities on old beech and and chestnut bark. Cetraria islandica - species under the regulations of the Law of Medicinal Plants (2000) and its subsequent ammandments up to date was reported near the high mountain road of Belasitsa Mt at high altitudes. GPS data of the collections'sites were taken with the help of Garmin Etrex 10 and incorporated in the text. Basic information on the distribution of each spesiec, so far khow in Bulgaria is presented. Data on the types of lichen substrats are given also.

Cicada orni L. in the food of *Sus scrofa* L.

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Abstract. The investigation were carried out in the period 1991-2000, in the Regional Park Maremma, Central Italy (42°39'N,11°05'E). The park is with area of about 9800 ha, covered by Mediteranian vegetation: *Pinus halepensis* Mill., *Pinus pinea domesticus* L., *Quercus ilex* L.,*Q. pubescens* Wild., *Arbutus unedo* L., *Phillirea latifolia* L., *Erica multiflora* L., *Pistacia lentiscus* L., *Rosmarinum officinalis* L. During the food analysis (faeces) of wild boar was established that one of the main foods for it in winter and spring are *Cicada orni* L. larvae. In one of the faeces were found 132 rests from larvae. This made us to start study seriosly the life of cicada and investigate its role as a food source for wild boar. It was also interesting to establish the influene of eild boar on the cicada's life. The formed hypotheses were 3: serious influence, no influence or increases its number significantly. Tothis aim, during 10 years were registered the first and the last male cicada singing each year. In order to investigate the larvae number which will fly during summer-spring period there were randomly chosen 23 pines on stems of which and in an area of 1 m around, every 15 days after the first song (8 - 10 June) were collected emty pupae. This way we established the number of cicadas and the dinamics of their fly which finished around 10 -15 August. The last song was registered around 10 - 15 September. Starting the studies each year was rtegistered the uniformity of the soil surface under the trees and was divided into 2 catagories: touched and non-touched soil. This way was established the influence of wild boar on the number of cicadas. t-Student analysis showed that it exist only during some of the years (1995 and 1997). This resultgave an answer about the validity of the first hypothesis that wild boar does not influence significantly cicada's number. This was also confirmed by soil samples (50x50x30 cm).

Combination of molecular and morphological data does not support the existence of *Haberlea ferdinandi-coburgii* species

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Abstract. *Haberlea* (Gesneriaceae) is a highly endangered genus, red-listed in Bulgaria. Two species, *Haberlea rhodopensis* (in Rhodope and Balkan Mts.) and *Haberlea fernandi-coburgii* (in putative locality in the Predbalkan region, near Lovech), have been described to occur, although this has never been adressed systematically. So far, *Haberleafernandi-coburgii* species has been marked on the basis of limited morphological data only. The aimof our study is to investigate the taxonomic and genetic status of *Haberlea* genus in Bulgaria. ISSR analysis revealed a low level of genetic diversity among all investigated population. In contract, a significant genetic differentiation was observed, with a strong separation between the population from Balkan and Rhodope Mts. However, both the multivariate morphological analysis and the chromatin data did not support such a division. The population of putative Haberlea fernandi-coburgii species from the type locality near Lovech did not form a separate entity in neither of our analyses. Therefore,we do not support its existence and we can conclude that *Haberlea* species in this locality is not botanically differend.

Forest fire impact on the soil carbon content and stock on the north slopes of Rila mountain

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Abstract. Forest fires are the major disturbing factor that can impact soil carbon content in a forest ecosystem, and may have a particularly long-term effect on carbon stock in soils. The purpose of the study performed was to establish the carbon content and stock changes in a soil under coniferous stands in result of forest fire occurred on the north slopes of the Rila mountain (the Dolna bania region). Stands of *Larix decidua* Mill. ranging in age from 25 to 35 years have been affected. The established sampling plots (SP) cover impacts of a crown fire (SP 1 and SP 2), surface fire (SP 3 and SP 4) and undisturbed stand (control SPc). The results obtained show clear influence of the forest fire on the soil carbon content. For the soil from SP 1 and SP 2, where the crown fire prevailed, a decrease in carbon content in comparison with the control values was observed. The opposite trend was documented for the soil carbon content from sampling sites influenced by surface fire. These values increase with about 1 % and reached 3.45 % of soil organic carbon. The maximum carbon stock was found for the soil from SP3. For this sampling site, the maximum values for burned biomass (forest litter, dead branches) were established. Simultaneously with soil carbon content, an increase in soil density in the fire influenced surface soil was detected. A continuous canopy cover and forest litter together with forest management practices are likely to achieve the combination of high wood yield and C stock.

Microbial activity of forest fire-influenced soils from the north slopes of the Rila mountain (region of Dolna Bania)

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Abstract. Microbial and enzyme indicators of forest soils affected by forest fire under conifers (*Pinus sylvestris* L., *Larix desidua*, Mill.) and mixed (*Pinus sylvestris* L., *Quercus cerris* L.) forests from the north slopes of the Rila mountain (region of Dolna Bania) have been examined 7 after wildfire occurrence. The highest proportion of the analysed micro-flora was represented by non-spore-forming bacteria, bacilli and bacteria, assimilating mineral nitrogen. The quantity of the actinomycetes and micromycetes decreased in soil affected by fire. The predominant species Bacillus megaterium, Bacillus cereus, together with non-spore bacteria play an important role at different stages of the mineralization processes of organic matter in the fire-affected soil. Additionally, an increased activity of the microflora as a whole in fire-affected soil in comparison with a control (unburned) sampling site was also established. Increase in soil temperature and pH - after a forest fire, accompanied with a simultaneous decrease in soil humidity provides appropriate conditions for an enhanced soil microflora activity. Results of the enzymes activity in the fire affected soil, especially those for catalase and cellulase, show considerable rising in comparison with those for the control site. Their activity was significantly higher than the protease activity. Therefore, the activities of these three enzymes can be used as indicators of the on-going biological processes in fire-affected soils. Appreciable changes of soil microbial activity have been established for the upper 0-5 cm of fire-affected soil most probably due to its heat- provoked destruction at the elevated forest-fire temperatures.

Challanges before the management and the protection of the spruce forest ecosystems in Vitosha Nature Park

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Abstract. In 1934 was founded the first national park in the Balkans, today Vitosha Nature Park. One of the objectives of the creation of the park is the conservation of natural spruce forest ecosystems in the high part of the mountain and the creation of conditions for scientific and recreational activities in them. Since 2001, a series of natural disturbances - windthrow, calamity of bark beetles, forest collaps and fires caused serious expert debate on how to be managed spruce forests on Vitosha mountain, so that they can carry out long-term functions under the conditions of natural disturbances. In the course of the discussion, I made a research analysis of the reasons leading to the occurrence of natural disturbances in the spruce ecosystems of Vitosha and of the effectiveness of the management measures. Also made is comparative analysis of the international experience in the management of coniferous forests affected by natural disturbances in Europe and North America. Based on this analysis, recommendations are made for the implementation of a differentiated approach to managing spruce ecosystems in the Vitosha NP. In order to restore and conserve the natural spruce forests and their biodiversity, in strict reserves should not be allowed human intervention. To limit bark beetle calamities in spruce forests within the boundaries of the reserves, it is recommended to apply sanitary measures in buffer strips around the reserves. In order to increase the effectiveness of forest protection activities in recreational forests in the park, these activities should be carried out in the shortest time of not more than 1 -2 months, whereby in inaccessible areas and in forests with difficult regeneration the trees affected by bark beetles should be felled, peeled and left on the forest floor.

Effect of soil physical properties on natural regeneration of *Populus caspica* Bornm. and *Alnus glutinosa* L. in North of Iran

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Abstract. The majority of northern Iran is covered by the Caspian forest, a deciduous temperate commercial forest. The Caspian forest comprises a narrow band of temperate deciduous forests and is contiguous with a larger forest block extending across eastern Turkey and Caucasia. The area of this forest is about 1.8 million hectares and the greater part of it is located on the northern slopes of the Alborz Mountains overlooking the Caspian Sea. The flora of the forest shows very little similarity to the Mediterranean flora and comprises a large number of central European species. *Fagus orientalis, Carpinus betulus, Acer velutinum, Quercus castaneifolia, Acer cappadocicum* and *Tilia platyphyllos* are the most important tree species. Between mountain region and Caspian Sea, there are plain areas that during last decades have been involved in agriculture, reforestation or deforestation activities. Populus caspica, as endemic and endangered poplar species and Alnus glutinosa as native to most of Europe and locally in southwest Asia, are the most important tree species naturally disturbed in this plain area.

Although the natural regeneration of *Alnus glutinosa* show good situation, unfortunately natural regeneration, distribution and elite trees of Populus caspica were diminished by different reasons. In this study, natural regeneration conditions of these species and their relationships with physical soil properties were carried out in two regions, with poor and good natural regeneration. Sampling as unequal linear transect with random harvest of sample pieces has been done. .In each sampling plot, diameter of breast height for each tree, height and diameter of each sapling and soil sample were taken. For all of soil samples, soil texture, bulk density (B.D) Particle density (P.D), and water holding capacity (WHC) were analyzed. The differences of quantitative characteristics of trees and soil properties between two plantations were analyzed based on independent samples t-test (Student's t-test at $p<0.05$), and correlation between variables were determined by Pearson correlation coefficient. The results of this study showed that there was strong relationship between establishments of natural regeneration of *Populus caspica* with soil physical properties. Natural regeneration of *Alnus glutinosa* did not show any relationship with soil physical properties. The natural regeneration of *Populus caspica* was established better in light soil texture with good aeration. The establishment of *Populus caspica* is possible in soils with suitable physical condition. The majority of northern Iran is covered by the Caspian forest, a deciduous temperate commercial forest. The Caspian forest comprises a narrow band of temperate deciduous forests and is contiguous with a larger forest block extending across eastern Turkey and Caucasia. The area of this forest is about 1.8 million hectares and the greater part of it is located on the northern slopes of the Alborz Mountains overlooking the Caspian Sea. The flora of the forest shows very little similarity to the Mediterranean flora and comprises a large number of central European species. *Fagus orientalis, Carpinus betulus, Acer velutinum, Quercus castaneifolia, Acer cappadocicum* and *Tilia platyphyllos* are the most important tree species. Between mountain region and Caspian Sea, there are plain areas that during last decades have been involved in agriculture, reforestation or deforestation activities. *Populus caspica*, as endemic and endangered poplar species and *Alnus glutinosa* as native to most of Europe and locally in southwest Asia, are the most important tree species naturally disturbed in this plain area.

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Biodiversity and conservation of Freshwater Fish of Arunachal Pradesh

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Abstract. Aranachal Pradesh state, a part of Himalaya biodiversity hotspot, has the larges in geographical as well as in river drainage area in North-Eastern region of India. The state harbours innumerable rivers and rivulets which era home to diverse fish species, of which many are endemic to this region. These organisms are important resource and good indicators of the ecological health of the waters they inhabit. The actual freshwater fish diversityof the state had not been completely explored because most of the rivers are located in unapproachable mountainous steep terrain with dense forest cover. The present work investigates freshwater fish diversity base on ecological variation and aquatic habitat diversity of the state and also altitudinal patternsof fishes distribution and their ecological habitat. Three ecological zones base on elevation changes in habitat are categorized viz. the lower altitude zone up to 300 m.msl (tropical zone), midle altitude zone up to 1200m.msl (subtropical zone) and hight altitude zone above 1200 m.msl (temperate zone/also alpine zone). The characteristic of these tree zones, habitat parameters and pattern of distribution fish species among the three ecological zones were analyzed in detail. This study recorded, 216 fish species belonging to 11 orders, 31 families and 94 genera from these three zones in the state. The richness of freshwater fish diversity of the state is 28% and 2.16% of freshwater ichtiofaunal diversity of India and the world respectivety.

New Herpetofaunal Locality Records on the Bozcaada (Tenedos) and Ecological Observations

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Abstract. Bozcaada (Tenedos) is located in the northeast of the Aegean Sea, southwest of the Çanakkale Strait (the Dardanelles) in Turkey. This study presents first evidence on the precence of *Lissotriton vulgaris* (Linnaeus, 1758) and *Natrix natrix* (Pallas, 1814) on Bozcaada (Tenedos) of the Turkish Aegean islands. It was given locality records for these species and given habitat characteristics and some ecological and morphological data about these species. Tenedos lacking in ponds and other sources of fresh water, therefore we think it is very important to the island's aquatic amphibia and reptilia specimens.

Reptilies of Thrace Region in Turkey

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Abstract. The Thracian Region constitutes 3% of Turkey with its area of 23.630 km^2. The land border of the Thracian Region, having a connection with Anatolia via Istanbul and Çanakkale Straits, with Greece, its border neighbor in the European continent, begins at the mount of the Meriç River and is 212 km in length. The Meriç River is the only obstacle that makes mutual reptile transitions difficult. Still, there may be amphibian and reptile transitions by vector agents. The length of its border with Bulgaria, another border neighbor, is 269 km and it starts at the entrance of the Meriç River in Turkey. The total border length of Turkey with Greece and Bulgaria is 481 km. Although the Thracian Region covers a small area of 3% of Turkey, it is a rich region in terms of amphibian and reptile species since it is the transitional zone between Europe and Anatolia, it includes different biotopes with important wetlands and due to its different ecological conditions and since it has the habitats for different species.

The Thracian Region is a transitional point in the distribution of reptile species from Europe to Anatolia and has different biotopes and ecological areas. Thus, as it is also stated in previous studies, it has a rich reptile fauna. In this study, it was stated that there were 4 chelonian, 11 lizard and 11 snake species in the region.

Urban Plant Diversity of humid regions in Istanbul

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Abstract. Within this study, the current woody plant taxa has been identified in the north regions of Istanbul, which is also having the feature of humid habitats. Site inspections, photographing, sample collection and detection studies has been carried out in the selected 10 sample areas. The determined woody plants were evaluated within the SPSS analysis program; for the rational distributions in terms of families. Furthermore, the usage densities of each plant taxa in this region has been identified according to their occurrence in the sample areas. According to the results obtained from this research, it is identified that the landscape design areas of the humid regions in Istanbul, has an important value of plant diversity within total of 361 woody plant taxa. The other important result is the intensively usage of exotic woody plants in the urban areas of Istanbul, humid regions.

The molluscs of the medieval settlement at the village of Zlatna Livada (Bulgaria) with notes on the landscape dominated the area

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Abstract. There were a total of 99 specimens of terrestrial snails from which the species Zebrina detrita dominated with 76 specimens. All other species were represented by 4-8 specimens each. As a whole the xerophilic species were most abundant – 84 specimens (Z. detrita and Helix figulina). The rest of the specimens were representatives of mesophilic species. The registered freshwater mussels were from the genera Unio and Anodonta, and the marine ones were Ostrea edulis, Mytilus galloprovincialis, and Lima hians.

A bridge too far? The limits in mitigation when should nature overrule economy and avoidance replace mitigation?

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Abstract. The aim of the current study is to awaken and boost the discussion on the limits of mitigation using a practical example and to sound out experiences elsewhere. Assess the need for and possibility to set limits where nature overrules economy and avoidance replaces mitigation. Assess which parameters play or may play a role (e.g. cost/benefit analysis). Assess whether mitigation measures should be more flexible. Damage to natural protected terrotories and biodiverity are discussed.

Butterfly Gardening

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Abstract. Butterflies are beautiful, flying insects with large scaly wings. The ephemeral beauty of the butterfly and the peculiarity of its life cycle symbolize transformation in nature and the passage of time. In some languages the word for "butterfly" is the same as that for "soul". Like all insects, they have six jointed legs, 3 body parts, a pair of antennae, compound eyes, and an exoskeleton. The three body parts are the head, thorax (the chest), and abdomen (the tail end).

Butterflies are considered good environmental indicators that particularly depend on diversity of flora and vegetation structure. However human effect, land use, climate and other factors are affecting the distribution and diversity of butterflies. In other words; vegetation structure and plant species are important constituent on butterfly population.

Urban landscape can be a potential areas for butterfly species via butterfly gardens. The identifcation and evaluation of plants within their attractive charactesirtics are important for planning and design of butterfly garden. In addition even the small areas will provide habitat for many butterfly species in urban green areas.

Landscaping even the smallest areas will provide habitat for many butterfly species. You can create suitable habitat for butterflies in your yard by selecting the appropriate flowering plants. Not only will you attract beautiful butterflies, but your yard also will be filled with colorful flowers throughout spring, summer, and fall. Butterfly gardening has become a rewarding outdoor hobby; but what exactly is butterfly gardening? Quite simply, A butterfly garden is a flower garden designed to attractand retain butterflies. As development infringes upon fields and meadows, butterflies are losing their habitats to new subdivisions and shopping malls. By providing the right types of plants, shelter, water and a safe haven for them to lay their eggs, you can attract butterflies to your garden. You may be able to witness a truly miraculous process of nature: the transformation from egg, to caterpillar, to chrysalis, to adult butterfly. And in the process, you might help ensure the continued and increased survival of common butterflies that are threatened by the destruction of their wild habitats.

New data about Agaricales in Bulgaria

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Abstract. This paper provides information about the distribution of 28 species of Agaricales. New data are reported or confirmations of previous older records are made.

A study of macromycetes in Boraka Reserve, Central Rhodopes Mts.

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Abstract. The data on the species composition, distribution and ecological-trophic structure of macromycetes in Boraka Reserve, Central Rhodopes Mts. are published for the first time. Six species includes in the Red List of fungi in Bulgaria: *Auriscalpium vulgare* Gray, *Hymenogaster luteus* Vittad., *Phallus hadriani* Vent. & Pers., *Rozites caperatus* (Pers. & Fr.) P. Karst., *Russula solaris* Ferd. & Winge. and *Sarcosphaera coronaria* (Jacq.) Boud.

Variations of Soil Nutrient Elements in Mixed Cultivation of Poplar and Peanut (Case Study: North of Iran)

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Abstract. The majority of the north of Iran is covered by Caspian forest, a deciduous temperate forest, located on the northern slopes of the Alborz Mountains overlooking the Caspian Sea. Between mountain region and Caspian Sea, there are plain areas that during last decades have been involved in agriculture, reforestation or deforestation activities. Because of population growth, increasing demand for wood and declining of forest harvesting, development in plantation of fast growing species especially poplars has occurred in the plain area such as Guilan plain, in recent years. Most of poplar plantations are pure in the world, and this matter could create some problem for successive plantings. On the other hand, short rotation utilization of different poplar species and clones may reduce nutrient availability in soil. Quantity and quantity of forest production is dependent to soil nutrients, and tree species and management activities can change soil nutrient availabilty. Agroforestry has been one of the solutions to prevent destruction of forest land, and maintaining of soil nutrient availability. This study was carried out in Lasht-e-Nesha Poplar Research Station (Guilan Province/Iran(37˚ 23̄ N, 49˚ 52̄ E) to evaluate the effect of pure and mixed plantations of poplar trees and peanut on some important soil nutrient elements. The research was done on the base of randomized complete block design with five treatments and three replications, including three treatments at poplar different planting (4m × 3m), (4m × 6m), (4m × 9m) mixed with peanut and two other treatments included pure plantations of poplar and pure cultivation of peanuts. The soil samples were taken from 0-20 cm depth of soils of different treatments. All of soil samples were analyzed for nitrogen, phosohorus and potassium. The results showed that nitrogen between pure and mixed treatment showed significant differences, but phosphorus and potassium between treatments did not show significant difference. Comparison of nutrient means by Tukey indicated that maximum amount of nitrogen and phosphorus was in the mixed treatment planting (4×9), and minimum amount of nitrogen in the mixed treatment planting (4×3). Maximum of potassium was observed in the mixed treatment planting (4×3) and minimum amount of phosphorus and potassium was in pure peanut treatment. It is concluded that mixed cultivation of poplar and peanut could be beneficial for maintaining the soil nutrient status for successive plantings in the north of Iran and other sites parallel to study area.

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2 - Office of Natural Resources and Watershed, Guilan Province, IRAN
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Abstract. Biodiversity in ecosystems affected by plant diversity, and study of vegetation in the ecosystems is major factor to evaluate the current state and predicting the future. The imposed pressure on ecosystems including grazing and exploitations cause destruction and reduce genetic diversity. This study was conducted to investigate herbaceous species diversity in protected and unprotected oriental beech in Masal region, Guilan province in north of Iran. Hyrcanian forests in northern Iran situated on the northern slopes of the Alborz Mountains and are under pressure from grazing and human utilization. The total area of this forests had been 5 million hectares, but Today about 1/8 ha of these areas has remained. For this study, 50 ha of protected areas and 50 ha of non-protected areas were surveyed. Primarily, altitude, aspect, slope percentage were recorded, then a sub-sample size was determined based on Whittaker's nested plot sampling and minimal areas method, and in each sub-plot with an area of 64 m, percent cover of each species was estimated according to Domin criterion. As well as canopy cover percentage of trees in each plots were estimated, then to evaluate the herbaceous diversity, components of diversity, evenness and richness were calculated and compared. Statistical analysis have been done with Student t-test for normally distributed data and non-parametric equivalent (Mann-Whitney U-test). Results indicated that the averages of leaf litter depth and canopy cover of trees in protected were higher than unprotected areas and they were significant differences ($p<0.05$) . The average herbaceous cover was higher in unprotected than protected areas. The average of diversity indexes H, N1, N2 and evenness indexes EQ, EVar, E5 and richness index (S) were greater in protected areas compared to the unprotected areas, such that with protecting against grazing, number and type of species has increased. In increasing diversity, evenness effect had been more than species richness and there were higher positive correlation between diversity and evenness indices. Finally should be expressed since species diversity was in a closely relationship with intensity of grazing and human traditional activities, necessary planning is done according to participation of local people and education for correct utilization.

In situ and in vitro conservation of *Glicyrrhiza glabra* L. – Crop Wild Relative from Fabaceae

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Abstract. *Glycyrrhiza glabra* L.(Licorice), belongs to Fabaceae. The species is included in the Crop Wild relatives list for Bulgaria and is close to beans and peas. Its origin is Southeast Europe, the Mediterranean and Asia, where Bulgaria falls. The roots of the plant contain glycyrrhizin, 30 to 50 times sweetener than the sucrose.

As a CWR, as well as due to the high level of glycyrrhizin in the roots, the conservation and maintenance of the species is of interest, although it is not included in the list of threatened plant species yet.

In the Institute of Plant Genetic Resources - Sadovo *Glycyrrhiza glabra* is maintained in situ in the Botanical garden.

Besides the in situ conservation of the species, in vitro techniques are a reliable means of reproduction and long-term storage. After introduction of the raw cuttings from plant species in culture in vitro, the process of micropropagation is accomplished by single bud microcuttings in nutrient medium fitted with growth regulators, enabling the development of single-rooted stems with options of repeatedly subcultivating. Along with that the possibility for long term in vitro propagation by reduction of the composition of the nutrient medium was tested, where the period for conservation of the cultivated explants reaches 6 months.

Diversity of herbaceous species in upland areas of Caspian forests in Iran

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Abstract. Biodiversity is one of the most important topics in the world. The reduction of biodiversity occurs by destructing of natural resources and environment in the world. The Caspian (Hyrcanian) forest is one of the most important regions for biodiversity studies in Iran. It is located in the north of Iran comprises a narrow band of temperate deciduous forests and is contiguous with a larger forest block extending across eastern Turkey and Caucasia. It contains more endemic species compare to many regions in Iran. Upland forests, located on high altitude of northern slopes of Elborz ranges/Iran, has been destroyed by human activities and grazing. Destruction of upland forest and effecting of this matter on biodiversity have made the basic idea of this study. The study was done at upland area of Tonecabon/Mazandaran province/North of Iran for comparison of biodiversity of herbaceous species at forest, ecotone (between forest land and pasture) and pasture with the aspect of species richness indices, evenness and biodiversity. To achieve this objective, sampling were performed by systematic randomly on one transect of 100 m square plots. In this study, total 72 herbal species were identified, which 33, 40 and 26 from all of species found in forest, pasture ecotone respectively. Results of ANOVA and Duncan's test have indicated that the diversity index in the forest and pasture areas are better than ecotone. Comparison of three areas with similarity coefficient, Jaccard and Sorenson, indicated that habitat conditions for herbal species in forest and pasture is better compared to ecotone area.

Conservation management of two rare plant species in Bulgaria

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Abstract. In 2010, a team of botanists started the implementation of a project named "BulPlantNet – A Pilot Network of Small Protected Sites for Plant Species in Bulgaria Using the Plant Micro-reserve Model". This project is financed by the LIFE+ Programme of the European Commission and by the Bulgarian Ministry of Environment and Waters. The strategic objective of the project is to conserve the plant biodiversity in Bulgaria focusing on species that are unique, or have strongly fragmented populations on the territory of the country, whose populations fall outside existing protected areas and whose survival is under serious threat.

Two of the project's target species were objects of the present work – the Balkan endemic Merendera attica and the Bulgarian endemic Anthemis argyrophylla. The aim of our study was to investigate their populations, to determine the threats and limiting factors and to contribute to species conservation. Both of them are critically endangered; they are included in the Red Book of Republic of Bulgaria and they are legally protected by the national Biodiversity Act. We present briefly the general and national distribution, ecological requirements, population size and state, main threats, and some in situ and ex situ actions aiming at conservation of their populations. Permanent plots for long-term monitoring were installed. The model of plant micro-reserve conservation was applied and 2 protected sites were officially declared; others are in process of designation. Elaboration of Action plans for the conservation of each species is now in progress.

Molecular phylogenetics of *Haberlea rhodopensis* Friv. from different localities in Greece

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Abstract. *Haberlea rhodopensis* (Gesneriaceae) is a highly endangered genus, red-listed in Bulgaria and Greece. Our previous studies of the remaining *Haberlea* populations collected from all localities of the plant species in Bulgaria (in Balkan Mts. and Rhodope Mts.) suggested that both mountain ranges might represent glacial refugia with a recent common history. Extending our previous studies, we have investigated the origin and genetic diversity of Haberlea species from five localities in Greece (Stena Nestou, Falakro, Paggaio, Menoikio and Greek Rhodope Mts.). All plant individuals were studied by chloroplast microsatelite markers, trnH-psbA intron-spacer and nuclear ribosomal DNA internal transcribed spacer sequences. The obtained results support our hypothesis that Haberlea has originated in the mid-Tertiary Oligocene. This was the first time that *Haberlea* from Greek localities has been included in a molecular study.

Anatomical changes in Peach leaves infected by *Taphrina deformans* (Berk.) Tul.

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Abstract. Light microscope study of Persica vulgaris Mill. (cultivar "Faiet") leaf anatomical structure, naturally infected by Taphrina deformans (Berk.) Tul. has been conducted. In the infected leaves histological changes were observed such as increase of the total thickness of the mesophyll and a loss of its differentiation to palisade and spongy parenchyma. An increase in the size of the upper epidermis was established as a result of fungus localization. The results were supported by morphometric and statistical analysis.

In situ and Ex situ Conservation of Rare Plants in the Bulgarian Flora

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Abstract. There are about 300 species of endangered vascular plants in Bulgaria whose populations are located outside protected areas and for which any protection measures have not been taken yet. In order to preserve these species threatened with extinction, the Institute of Biodiversity and Ecosystem Research and the Ministry of Environment and Water developed a project entitled "A pilot network of small protected sites for plant species in Bulgaria using the plant micro-reserve model" under the EU Life+ Program. The project concentrates on 47 plant species of high conservation value, localized in 61 sites throughout the country. For conservation of the species and their habitats a number of conservation activities have been taken: designation of small protected sites, elaboration of a long-term monitoring plan for each species and regular monitoring of its populations, development of action plans, in situ and ex situ conservation activities, information campaigns to raise public awareness on plant conservation issues. Significant progress in the protection of the target species in their natural habitats and in ex-situ collections has already been achieved. As a result of the project a network of 61 small legally declared protected sites (micro-reserves) will be established. Other major results include development of action plans for all target species, on-line database with information on the species and their monitoring, and a strategy for sustainable development of the network of small protected sites for plant conservation in Bulgaria.

Preliminary Results of Species Composition and Dinamics of Family Culicidae (Insecta: Diptera) in Plovdiv city

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Abstract. There are about 3600 species mosquitoes from Family Culicidae (Insecta: Diptera) in the world up to now distibuted in all geografical areas. They are one of the most important in epidemiological point of view insects. They are carriers of more than 50 viral and bacterial infections and parasitic (malaria, yellow fever, viral encephalitis, dengue fever, tularemia, filariidozis etc.).

In Bulgaria 46 species from 9 genera has described till now (Mihov, 2011).

Recent studies on the species composition of mosquito fauna in the region of Plovdiv dating from 1997.

Based on the literature and our own preliminary studies was collected and summarized all available information about species composition, ecology and the importance of mosquitoes as vectors in the city of Plovdiv and the region.

The preliminary study was conducted in two consecutive years (2011 and 2012) from May to October. In the period May to December 2011 and 2012, for each month samples using the "Manual assembly" also were collected. Eight biotopes were identified for the city of Plovdiv.

The aim of this study was to investigate the species composition, morphology and biology of mosquitoes in the family Culicidae in urban biocenosis (Plovdiv city).

The article provides information on the species composition and dynamics of mosquitoes in the city of Plovdiv. 13 species have been identified from 6 genera up to date and the dynamic for each month for the study period is given.

Study on the morphology of *Acanthocephalus ranae* from *Rana ridibunda* in Bulgaria

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Abstract. The present study was based on acanthocephalans isolated from small intestine of *Rana ridibunda* Pallas from the region of village of Zagortsi (Stara Zagora Region) in 2007. The specimens were fixed and preserved in 70% ethanol. They were cleared in glycerol (25-100%) or dimethylphthalate and studied in temporary mounts by light microscope Leica DM 2500 with colour digital camera.

Despite the large number of study on the helminth fauna of *Rana ridibunda* (Dimitrova and Georgiev, in press), the morphometric data of *Acanthocephalus ranae* (Schrank, 1788) Lühe, 1911 are very poorly in Bulgarian helminthological literature. There are only two records on the morphology of this species but they prepare on the single specimens found in not typical hosts (bird and mammal) (Dimitrova, 1998; Dimitrova et al., 2008). In the course of the present study, new data of measurements of hooks were recorded. The critical comments on morphology of Bulgarian materials and literary data are also presented. The species is described and figured on the base of the present materials.

An Ecological Evaluation About The Woody Plant Hardiness (A Case Study of Rural Areas in Istanbul)

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Abstract. The aim of this study which is carried out in the rural regions of Istanbul, is to identify woody plant diversity and to evaluate the harmony of the plants with the ecological structure of the region. An evaluation has been made to determine the harmony of the plants within the ecological structure of the research area. In this work, "the formula of plants deployed area" has been used, which was developed by Schroeder (1976) and gives information about the deployed area, geographical distribution, the vegetation zones and the sub-zones of the species. According to this classification the hardiness of the woody plant species determined in the landscape designs of rural areas in Istanbul has been examined.

The important results identified in this study are, the intensively usage of exotic woody plants and also the reality that some of the woody plant taxa used in the landscape designs of this area are not ecologically suitable for this region.

Species composition and zoogeographical aspects of the Central Balkan Mountain tabanid fauna

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Abstract. The study was carried out in 11 localities on the territory of the Central Balkan Mountain during the active seasons of the tabanids in 2010-2011. As a result of the study 2437 tabanid specimens were collected and processed. A total of 28 species from 9 genera were identified: *Chrysops (3), Atylotus (1), Therioplectes (1), Hybomitra (3), Tabanus (13), Heptatoma (1), Haematopota (4), Dasyrhamphis (1)* и *Philipomyia (1).* Eleven of the established species are reported for the first time for the Central Balkan Mountain tabanid fauna. The tabanid fauna of the Central Balkan Mountain is predominated by the elements of the Boreurasian subregional fauna (60.71 %).

In situ Conservation of Bupleurum uechtritzianum S. Stoyanov (Apiaceae) in Bulgaria

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Abstract. *Bupleurum uechtritzianum* is described as a species new to science in 2010 from Bulgaria (the valley of Cherni Lom River, Ruse district). It is Balkan endemic with a scattered occurrence in Northeastern Bulgaria and Romanian Dobrogea. In Bulgaria there are four known localities of the species, and eight in Romania. *Bupleurum uechtritzianum* inhabits sparse shrubby communities of Carpinus orientalis or occupies ecotone between C. orientalis forest and dry grassy communities on a calcareous terrains (refer to habitat type 6240* Subpannonic steppe grasslands of Annex I of the Habitats Directive, 92/43/EEC). Its current restricted distribution is due to its probably ineffective ability for dispersal as well as to the fragmentation of natural habitats, which is result of old, long lasting human presence in this plain-hilly part of Europe.

For the species and its habitats there are real threats from natural and anthropogenic origin, which require urgent conservation measures.

Bupleurum uechtritzianum is a target species in the project “A pilot network of small protected sites for plant species in Bulgaria using the plant micro-reserve model” (financed by the Life+ Programme), within which are realized in situ and ex situ conservation activities in order to ensure conservation and sustainable existence of populations of valuable flora species in Bulgaria.

The poster presents information on the distribution, conservation value and the measures taken to protect B. uechtritzianum in its natural habitats in Bulgaria. An assessment on national level was made by the criteria of IUCN Red List of Threatened Plants.

Vascular flora – protection capacity of the Northern Black sea coast in Bulgaria

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Abstract. Interpretation of the information about diversity, conservation value and distribution of the vascular flora capacity from the Red Book of Bulgaria, vol.1. Plants; along the costal area.

Chorology of species from Red book (op.c.) Conspectus of the Bulgarian vascular flora, comparison of the number of populations; its frequency, threats and prognosis for the existence are given.

Critically endangered species –Black sea coast –21; Only in northern part –7; Endangered species - Black sea coast -75, Only in northern part– 36; Vulnerable species -Black sea coast– 4, Only in southern part -0 species.

Black sea coast -101 species with conservation value; Only in northern part 43 species; Cross pollinated species, forming panmict population are 52. Species forming clones, are 3. Species forming clone - populations are –46. All vulnerable species (4) are cross-pollinated, forming panmict populations.

This interpretation consists of data from the new Red book, vol. 1 Plants and new personnel data. The species that are not confirmed to the moment are mentioned too because of the possible finding after targeted chorological investigation.

The analysis of the distribution and category of threats can be determinate as a gene pool with very high conservation value under significant anthropopression because of the non-regulated building and golf terrains. It is time for real protection and evaluation of the conservation capacity of the whole Bulgarian Black sea costal area.

New information about polyphenols of wild (*A. webbii*) and cultivated (*A. communis*) almonds from southwestern Bulgaria

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Abstract. Plant material (flowers and leaves) of five individuals of *Amygdalus webbii* Spach and *A. communis* L. were examined for their polyphenolic composition in relation to clarify the eventual taxonomic relations between them. Eight flavonoid glycosides, two flavonoid aglycones and two phenolic acids were detected by thin layer chromatography (TLC). They were identified as quercetin-3-rutinoside (rutin), isorhamnetin-3-rutinoside, kaempferol-3-rutinoside, quercetin-3-galactoside (hyperoside), quercetin-3-glucoside, kaempferol-3-glucoside, quercetin-3-rhamnoside, kaempferol-3-rhamnoside, quercetin, quercetin-3-methyl ether, chlorogenic and cafeic acids by co-chromatography with authentic markers. It is a flavonoid composition of the samples of flowers, the leaf samples showed a simpler qualitative flavonoid composition. Rutin, hyperoside and quercetin-3-glucoside were detected as main components of the leaf samples. The comparative TLC analysis of polyphenolic profiles of all studied samples showed that same polyphenolic compounds were present in each almond individual with small variations in relative levels. Total phenolic and flavonoid content of the studied samples were evaluated by spectroscopic method. Leaf samples have a higher content of phenolic compounds and lower of flavonoids in comparison with the samples of flowers. Generally the samples of *A. webbii* displayed higher amount of phenolics than that of *A. communis.* The same trend was observed in the accumulation of flavonoids but the differences were not statistically significant.

The received results showed that there is no divergence of *A. webbii* and *A. communis* in respect to their polyphenolic composition. Considering that flavonoids and phenolics play a major physiological role, especially in resistance to various stress factors and diseases can be concluded that the adaptive and resistance capacity achieved in the early stage of species formation of *A. webbii* is effective even in the cultivated as *A. communis* (Bulgarian origin). To the best of our knowledge, this a first report for flavonoid composition of flowers of *Amygdalus.*

Occurrence of *Buellia aethalea* and *B. griseovirens* (lichenized ascomycetes, Physciaceae s. lat.) in Bulgaria

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Abstract. Two lichenized fungi, *Buellia aethalea* and *B. griseovirens*, are reported for the first time from Bulgaria. *Buellia aethalea* was found in three localities, on siliceous substrates: in the coniferous belt of the Western Rhodopes, the subalpine zone of Mt Belasitsa, and the Valley of River Strouma. The record of *B. griseovirens* is based on a material, collected on dead coniferous wood from the Western Rhodopes.

Larger basidiomycetes and lichenized fungi of conservation value in Balgarka Nature Park in Central Balkan (Shipchenska and Trevnenska mountains)

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Abstract. Data about the distribution of 8 larger basidiomycetes and 2 lichenized fungi of conversation value in Balgarka Nature Park in Central Balkan (Shipchenska and Trevnenska mountains) are given. The most of the species have been recorded during 2012 - 2013 in beach forests on the territory of the park. All basidiomycete species are included in the Red List of fungi in Bulgaria. They are listed in the following categories: Criticcaly Endangered (CR) 1 - species: *Clavicorona pyxidata* (Pers.: FR.) Doty; Endangered (EN) - 2 species: *Chlorophyllum agaricoides* (Chern.) Vellinga and *Hericium erinaceus* (Bull.: Fr.) Pers.; Vulnerable (VU) - 4 species: *Arrenia spathulata* (Fr.:Fr.) Readhead, *Hohembuehella petaloides* (Fr.: Fr.) Shulser, *Leccinum quercicum* Pilat and *Strobilomyces strobiliaceus* (Scop.: Fr.) Berk.; Near Threatened (NT) - 1 species: *Hericium coralloides* (Scop.: Fr.) Pers. Three endangered species (*Chlorophyllum agaricoides, Clavicorona pyxidata* and *Hericium erinaceus*) are includet in the Red Data Book in the Republic of Bulgaria. *Hericium erinaceus* is fungalspecies threatened in European level and is listed in the Criterion A(ii) species in the Balgarka Importan Plant Area in Bulgaria. *Cetraria islandica* (L.) Arh. and *Lobaria pulmonaria* (L.) Hoffm. (lichenized fungi) are of conversation value in Bulgaria. *Lobaria pulmonaria* is considered as species of high conservation value in the most European countries. It is included tradicionally in the Red lists of lichenized fungi in Europe.

Larger basidiomycetes and lichenized fungi of conservation value in Balgarka Nature Park in Central Balkan (Shipchenska and Trevnenska mountains)

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Abstract. Data about the distribution of 8 larger basidiomycetes and 2 lichenized fungi of conversation value in Balgarka Nature Park in Central Balkan (Shipchenska and Trevnenska mountains) are given. The most of the species have been recorded during 2012 - 2013 in beach forests on the territory of the park. All basidiomycete species are included in the Red List of fungi in Bulgaria. They are listed in the following categories: Criticcaly Endangered (CR) 1 - species: *Clavicorona pyxidata* (Pers.: FR.) Doty; Endangered (EN) - 2 species: *Chlorophyllum agaricoides* (Chern.) Vellinga and *Hericium erinaceus* (Bull.: Fr.) Pers.; Vulnerable (VU) - 4 species: *Arrenia spathulata* (Fr.:Fr.) Readhead, *Hohembuehella petaloides* (Fr.: Fr.) Shulser, *Leccinum quercicum* Pilat and *Strobilomyces strobiliaceus* (Scop.: Fr.) Berk.; Near Threatened (NT) - 1 species: *Hericium coralloides* (Scop.: Fr.) Pers. Three endangered species (*Chlorophyllum agaricoides, Clavicorona pyxidata* and *Hericium erinaceus*) are includet in the Red Data Book in the Republic of Bulgaria. *Hericium erinaceus* is fungalspecies threatened in European level and is listed in the Criterion A(ii) species in the Balgarka Importan Plant Area in Bulgaria. *Cetraria islandica* (L.) Arh. and *Lobaria pulmonaria* (L.) Hoffm. (lichenized fungi) are of conversation value in Bulgaria. *Lobaria pulmonaria* is considered as species of high conservation value in the most European countries. It is included tradicionally in the Red lists of lichenized fungi in Europe.

A case of ovotestis in the barbel *B. cyclolepis* from Maritza River

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Abstract. Analysis of the fish reproductive biology is justified by both environmental and economic reasons. The presence of ovotestis has been used as an indicator of exposure to estrogenic compounds and has been documented in a variety of wild fish species (roach Rutilus rutilus, catfish Clarias gariepinus, gudgeon Gobio gobio etc.) in many geographic areas. According to many authors male populations in rivers downstream from sewage treatment plants have a high frequency of occurrence of testicular oocytes.

The aim of this study was to analyze histological the process of spermatogenesis of an endangered fish species – the barbel Barbus cyclolepis living downstream the Maritza River, some 30 km from the second largest city in Bulgaria. The investigation was curried out by 2-monthly sampling (electrofishing) from March to November over a two-year period.

From all testis samples in one male (3.8 g and 65 mm) analyzed in April, the presence of ovotestis has been established or the s.c. testicular oocytes. The ovotestis does not differ from the testis macroscopically, but during the macroscopic examination we have established that previtellogenic oocytes have been positioned among the testicular lobules in groups or separately. This picture can be seen all over the total gonad.

Though being a single case, the ovotestis establishment among the barbels investigated has imposed continuation of the investigation in this trend, allowing at the same time its inclusion as a bioindicator and biomonitoring species as regards the introduction of the European recommendations for categorization of the different types of water bodies.

Diversity and Ecology of Filamentous Blue-Green Algae in Bulgarian Standing Water

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Abstract. The present study represents data about the diversity and ecology of filamentous blue-green algae collected from 64 Bulgarian reservoirs. Forty nine cyanoprokaryotic species, which belong to 18 genera and six families from two orders were identified. Morphological and ecological characterization of the identified species has been performed. Data about physicochemical parameters of sampling station were also provided.

СЕКЦИЯ „ЕКОЛОГИЧЕН МОНИТОРИНГ И ПРИЛОЖНА ЕКОЛОГИЯ”

SECTION “ECOLOGICAL MONITORING AND APPLIED ECOLOGY”

Physico-Chemical and Bacterial Characteristics of Surface Water of Saricay Stream (Canakkale/Turkey)

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Abstract. Water samples were collected from five different sites of the Saricay Stream (Canakkale, Turkey) in the months of January 2011 – December 2011 for the analyzing of some physico-chemical and microbiological parameters of the stream. In the present investigation, the stream temperature, pH, electrical conductivity (EC), dissolved oxygen (DO), biochemical oxygen demand (BOD5), values were altered between 15.8± 6.39 -16.2± 6.74 oC; 7.7 ± 0.50 - 7.9 ± 0.42; 5.0± 2.54 - 11.6± 5.43 mS/cm; 7.0±2.70 - 11.8± 0.75 mg/L, 7.14 ± 2.13 – 13.72 ± 7.67 mg/L, respectively. Nevertheless it is seen that waters of Saricay Stream for total coliform and faecal coliform at the sites 1 - 5 belonged to class 3 and class 4, respectively. Furthermore, the presence of Aeromonas sp., Vibrio sp., Plesiomona shigelloides and enteric bacteria in the water samples warrants for proper measures to reduce the pollution at point sources and requires proper remediation strategies to combat contamination in the river water.

Effect of Heavy Metals on Survival and Oxygen Uptake in Carp

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Abstract. Effect of brief exposure with Cd, Cd+Zn, Cd+Pb and Cd+Ni on behavior, survival and oxygen consumption of carp (Cyprinus carpio L.) was studied. All parameters significantly correlated to the Cd concentration in the water. Antagonistic relationships between Cd-Zn and Cd-Ni were found. Synergistic effect existed between Cd and Pb. The descending row of studied heavy metals on the base of their toxic effect on fish was found to be as follows: Cd > Cd+Pb > Cd+Ni> Cd+Zn. Fish biotest, as a fast, non-expensive, easily applied and reliable method, could be included in an integrated model for environmental monitoring.

Heavy metal monitoring in river water and sediments

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Abstract. Heavy metal content and background levels of Cd, Cu and Pb were studied at Trigrad River basin (Western Rhodopes, Bulgaria). The assessed metal concentrations in water and sediment samples illustrated Cu and Pb dispersion with the increased water level along the river flow. River water contained elevated Pb ammount, while the major part of Cu was accumulated in the sediments. Naturally higher background levels were assessed probably in connection with the specific hydrochemistry of the rivers in the studied region.

Monitoring of Priority Substances and Specific Pollutants in Maritsa River

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Abstract. Priority Substances and Specific Pollutants in Maritsa River were monitored. The nine-month studies were conducted in the period 2012-2013 at selected sites along Maritsa River. The results achieved indicated improvement of status of the river water.

Some `hot spots` atmospheric assessment with mosses in Bulgaria

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Abstract. The idea of using some mosses to estimate atmospheric heavy metal deposition was developed in the late 1960s in Sweden. It is based on the fact that mosses, especially the some carpet-forming species, obtain most of their nutrients directly from precipitation and dry deposition. The technique of moss analysis provides an alternative, time-integrated measure of the spatial patterns of heavy metal and toxic elements deposition from the atmosphere to terrestrial systems within the framework of UNECE ICP-Vegetation, the monitoring of background heavy metal deposition based on concentrations found in mosses were performed every five years, and, since 1995 also Bulgaria.

This study is concerned on the ecological important `hot spots` in the Bulgarian Moss Survey 2010. Principal component analysis (PCA) was used to study relationships between the different elements in each site. The spatial trends were assessed and evaluated.

Effect of urban air pollution on deciduous tree species (Plovdiv, Bulgaria)

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Abstract. Plovdiv is one of most polluted cities in Europe in respect to the air quality. Development of plant species under constant and high level of contamination is very difficult. This requires systematic biological monitoring on the health status of urban trees. Leaves of Betula pendula, Aesculus hippocastanum, Tilia argentea, Tilia cordata, were studied as one of the key elements of the green system of the city. Trees along the main roads in central part, along the railways and those close to the industrial area were found in worsened physiological condition. The proposed model for tracking changes in trees under the influence of urban air pollution can be applied to other phytomonitoring studies.

Content of phenolic compounds in the genus *Carduus* L from Bulgaria

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Abstract: Phytochemical screening for content of total polyphenols, flavonoids, phenolic acids and anthocyanins in Bulgarian Carduus L. species was made. The plant material (inflorescences) was collected during the period 2011-2013 from all 14 species found in Bulgaria, from natural habitats and different floristic regions. Analysis of defined compounds was done according to 11 Russian and 7 European Pharmacopoeia. For some species data are provided for the first time in terms of phenolic compounds. A higher content of flavonoids (1,8-3,2%) and total phenols(1,7-2,3%) was found compared to that of phenolic acids (0,6 to 2,4%) and anthocyanins (0,5-1,5%). Species distinguished by the highest content of these valuable biologically active substances were Carduus thracicus (for total phenols and anthocyanins), Carduus thoermeri and Carduus candicans ssp. globifer (for flavonoids), Carduus armatus (for phenolic acids).

Dispersion Modeling of Air Pollution Emitted from Traffic in the Transport Tunnel Under the Old Town of Plovdiv

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Abstract. Urban transport tunnels are characterized by an elevated air pollution, especially in cities with heavy traffic and low flow rates vehicles. The aim of this study was to evaluate the air pollution in the transport tunnel on "Tsar Boris III" Boulevard, Plovdiv (Bulgaria), using the methods of dispersion modeling of emissions from vehicles. During the experiment, two peaks were identified in the intensity of traffic - in the intervals from 8.40 to 8.50 pm and from 17.15 to 17.35 pm.

The estimated concentrations of NOx and CO from the traffic in the tunnel were compared with the relevant data from the automatic measuring station for air quality monitoring, situated nearby. We found that changes in concentrations were synchronous and proportionate, as the source of contamination was the same transport stream as passing through the tunnel and past the station.

Changes in concentrations of PM10, calculated in the tunnel and measured from the station varied at the start and end of the day, probably due to emissions from fossil fuel combustion. The results of the study showed that the major air pollutant in the tunnel were nitrogen oxides, the concentration of which was 4 to 6 times greater than the maximal value of hygiene norms.

Biochemical changes of an organism of *Apodemus flavicollis* (Rodentia: Muridae) under conditions of environmental anthropogenic pollution by heavy metals in northern areas of Ukraine

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Abstract. Man-caused chemical pollution of ecosystems is an actual problem at the present. Kyiv region is one of the most contaminated in Ukraine. 443 industrial enterprises are exposing as sources of air pollution in Kyiv region. The present research dedicates the integral assessment of biochemistry indexes of nature populations of rodents under conditions of environment pollution by heavy metals. Researches were conducted on nature population of yellow-necked mouse (*Apodemus flavicollis* Melchior, 1834), which is living on territories with different level of anthropogenic pollution. Environment of this species closely concerned with soil bedding. Therefore A. flavicollis may come as a biomonitor of man-caused pollution of environment. The raised content in soils of mobile forms Pb, Cd, Cr, Ni and Co was revealed on distance of 500 m to the South-West from Tripillya Thermal Power Plant (Kyiv region, Ukraine). That's considerably (3–5 times) exceeds levels for territory of Kaniv Nature Reserve (Cherkassy region, Ukraine). Territory of National Nature Park "Holosiivsky" (Kyiv, Ukraine) characterized by rather increased content of active form of researched heavy metals especially Pb. Increase of the concentration of diene conjugates (3–7 times) and malonic dialdehyde (2–4 times) in yellow-necked mouse liver of under pollution by heavy metals has been discovered. Insignificant increasing of content of Schiff basis in liver cells of rodents in region of impact of Tripillya TPP (in 2 times in spring and in summer, in autumn – in 2.5 times) was detected. Seasonal dynamics of the maintenance of lipid peroxidation has been revealed. The registered changes of biochemical indicators testify about presence ecological-biochemical stress in an organism of the yellow-necked mouse in the district of influence of Tripillya TPP.

Plant succession in post fire communities of *Pinus nigra* Arn.

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Abstract. Logical consequence of climate drought and the increased human activity today are the fires around settlements. On burned areas plant communities are formed with a specific composition and structure. This study aims to analyze the floristic composition on three after fire communities, occurring at different times in the Stara Zagora green zone. An analysis of Raunkiaer life forms is made and the degree of canopy cover is calculated on Braun Blanquet. The results allow prediction development of secondary plant succession on burned areas.

Remote Sensing of Leaf Biomass Production by Rhodope Mountains Deciduous Forest

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Abstract. Production of leaf biomass by deciduous forests in the Rhodope Mountains is studied. Leaf biomass is estimated based on LAI/FPAR data product of spectroradiometer MODIS on board of the satellites Terra and Aqua (NASA). The relationship between leaf area index(LAI) and specific leaf area(SLA) is used to determine the leaf biomass production of the broadleaf forest. A method for determining the maximum leaf area was developed. Assessment of the SLA is based on in situ measurements and literature data for widespread broadleaf species - hornbeam, oak, beech. To determine the geographic distribution, location and altitude of forest tree species on the territory were used products: CORINE land cover types (2006) and Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER) Global Digital Elevation Model Version 2 (GDEM V2), 2011.

Sustainable management of the catchment area of the dam - adaptation for floods, droughts and poor water quality

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Abstract. This article was prepared at the request of the concessionaire of Malo Buchino dam. The dam is used for fishing and recreation. There is an idea to build a hotel complex that is fully compliant with environmental practices worldwide. Therefore, in the section "Hydrology" of the project are discussed options that are actually applied in countries such as Germany, France, Sweden, The Netherland, USA, Brazil, Australia, Japan. For a description of the activities have not made special studies, except travel over the catchment area by foot. This does not mean that there are not taken into account the characteristics of the area. This sample version of the activities can be extended considerably, but the author believes that it is not required in that case. It is important to note that this approach can be used not only for the management of this lake and watershed, but for the integrated management of other river basins in the country.

Assessing River Hydromorphology with Macrophyte-based Metrics

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Abstract: The study was focused on selected 6 macrophyte-based metrics: number of species, hydro- and hygrophytes percent share, Salicaceae projective cover, Fontinalis antipyretica presence, and presence of Potamogeton crispus and Elodea canadensis. The above metrics were applied to database of 82 sites in the range of 3 basin districts in Bulgaria. Macrophyte quantitative and qualitative characteristics allowed the application of metrics at 60% of the database.

Genotoxic Effects of Dodine (1-Dodecylguanidium Acetate) on Root Cells of *Allium cepa*

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Abstract. Modern agriculture and industry base on a wide variety of synthetically produced pesticides including fungicides, insecticide and herbicides. Especially fungicides are most commonly used against diseases of crops in many countries. These chemicals or their derivatives can accumulate in the organisms and cause risk of mutagenicity, carcinogenicity or teratogenicity. Short-term genotoxicity tests are widely employed to evaluate the genotoxicity of many chemicals, including pesticides, to people, animals and plants genetic materials. *Allium cepa* L. test is highly sensitive, reliable and capable of detecting mutagens, carcinogens and clastogens.

Dodine is a fungicide extensively used to control scab on apples, pears and pecans, brown rot on peaches and several foliar diseases of cherries, strawberries, peaches and black walnuts. The aim of this study was to evaluate the genotoxic effects of dodine on mitotic index and mitotic phases by employing Allium test for the first time. To investigate the effects of dodine, the roots of A. cepa were treated with 0,04 ml/l (EC50/2), 0,08 ml/l (EC50), 0,016 ml/l (2xEC50) concentration of dodine for 24, 48, 72 hours. The micro slides were prepared and analyzed for each concentration and the control. The mitotic index was calculated as the number of dividing cells per number of 1000 observed cells. And also the chromosome aberrations were scored at each concentration.

The results showed that dodine significantly induced mitotic abnormalities such as bridges, stickiness, laggard, break, chromosome deformation, C-mitosis. The total percentage of mitotic aberrations was increased depending on concentration and period of treatment. Mitotic index decreased significantly with increasing of concentration and the exposure time as compared to their controls. Our results were point out that dodine has potentially genotoxic effects and should be used under control due to its possible toxic effects on farmers and humans consumed the plants.

Study the impact of climatic conditions on biological indicators of Burley tobacco varieties

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Abstract. Studied, analyzed and compared were correlations between climatic indicators: average daily temperature and rainfall on the one hand and the most important biological indicators on the other hand in five different varieties of Burley variety group tobacco. While biometric indicators are observed relatively little influence on the weather conditions, the length of the vegetative period were significant effects of environmental conditions. The stronger the influence of the amount of precipitation than temperature sum. Most sensitive to environmental conditions is introduced variety Burley 21, and the stands least sensitive variety Burley 1344. This variety is characterized by high stability manifested in terms of biological indicators. The study shows that genotype is of crucial importance of the impact of environmental conditions on the most significant biological indicators of Burley tobacco.

Comparative study of the influence of climatic conditions on biological, economical and chemical indicators of samples Large-leaf Tobaccos of varietal groups Burley and Virginia

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Abstract. Studied and are compared correlation between climatic indicators: average daily temperature and rainfall on the one hand and the most important biological, agricultural and chemical indices for on the other hand by ten samples Tobacco Burley and Virginia. There is a moderate positive correlation between the length of the vegetative period and rainfall in Virginia and Burley tobacco. With the exception of the length of vegetative period, the impact of climate on biological indicators is negligible. The stronger the influence of the amount of precipitation than temperature sum. There is a moderate positive correlation between yield and rainfall in both types of tobacco. There is a proven negative correlation between the content of nicotine and rainfall in Burley and Virginia tobacco. In our studied samples Large-leaf Tobaccoc climatic influence is stronger on the biological, economic and chemical characteristics of Burley tobacco, i.e that tobacco more influenced by environmental conditions.

Study on the Heating Degree Days in Several Cities of Bulgaria

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Abstract. This paper discusses the results of study on the heating degree days (HDDs) in several cities of Bulgaria.The study area is an urban environment situated in different eco-regions with different populations and air pollutions.For urban areas the knowledge of heating requirements plays a significant role for termal perception or comfort conditions as well as thermal adaptation of humans. The HDD is a good estimation of an accumulated cold during the cold season as well as an index for heating energy consumption within the heating season, which in Bulgaria generally begins in October and ends in April.During the heating energy production from different sources as coal,gas,biomass, and electricity are released many related pollutants,which have a good relation to the magnitude to the HDDs.In order to estimate the HDDs,the maximum, mean and minimum daily air temperature values were used.The cumulative HDDs separately for each one of the cold months are estimated. The months with the greater heating demand are December,January and February.The intrannual course of the HDDs for each month is analyzed and it is ascertained that there are significant fluctuations around the monthly mean values, which characterrize the periods of higher or lower energy consumption.

An Invesitigation on Antioxidant Activity of Methanol Extract of Three *Hypericum* L. Taxa Leaves Naturally Distrubuted on Ida (Çanakkale-Turkey) Mountain

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Abstract. Plants of the *Hypericum* spp., well known for their use in traditional medicine, contain hypericin, pseudohypericin, flavonoids, phloroglucinol and hyperforin. There are 69 species of *Hypericum* in Turkey 43 of which are endemic. On Ida Mountain, 8 species are distributed, and one of them is endemic.

These species have been used in traditional medicine for the treatment of external wound and gastric ulcer, and they have also been benefited as antidepressant, antiseptic, and antispasmodic. In this study, the antioxidant activities of methanol extract obtained from leaves of *Hypericum perforatum* L., *Hypericum triquetrifolium* Turra., *Hypericum perfoliatum* L. taxa which are distributed in Ida (Canakkale-TURKEY) mountain have been investigated through DPPH (2,2-diphenyl-1-picrylhydrazyl) method. According to the results, it has been found out that antioxidant activities of the taxa that have been analyzed differ in terms of dose from which extracts have been gained. It has also been identified that *H. perforatum* L. taxon has a higher value than other taxa. Leaves extract rate of *Hypericum perforatum* L. is higher than *Hypericum triquetrifolium* Turra whereas *Hypericum perfoliatum* L. extract value is less than other taxa.

An Investigation on Cytotoxic Effect of Different Aerial Parts of *Hypericum tetrapterum* Fries Naturally Distrubuted on Ida (Canakkale-Turkey) Mountain

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Abstract. *Hypericum* genus members are medicinal plants distributed in Europe, Asia and North Africa, America and Mediterranean which has been used since ancient times by many civilizations for medicinal purposes. *Hypericum tetrapterium* Fries. is important member of this genus because of its high antioxidant, antibacterial and antiviral capacity. In this study, cytotoxic effect that was obtained from different aerial parts (leaves, flowers, stems) of *Hypericum tetrapterium* Fries. naturally distributed on Ida mountain. Cytotoxic effect was determinated by means of WST-1 (colorometric) in L929 mouse fibroblast cell line ages. According to the data that was obtained in terms of cytotoxic effect, all data studied on L929 mouse fibroblast cells showed high cytotoxic effect at various dilutions.

Probability Distribution of Flood Flows in the Rivers of the South Eastern Part of Bulgaria

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Abstract. Peak or flood flow is an important hydrologic parameter in the determination of flood risk, management of water resources and design of hydraulic structures. There is a need, therefore, to estimate how often a specific flood event will occur, or how large a flood will be for a particular probability of exceedence or recurrence interval. This might be achieved through flood frequency analysis procedures, which involve the estimation of distributional parameters and the extrapolation of cumulative distribution functions to generate extreme flood values. In this study, basin-wide analysis of flood flows is conducted for the rivers of the South Eastern part of Bulgaria using annual flood peak flows from 9 gauging stations. The record length of the data varies from 28 to 42 years. The L-moment method is used to analyze the regional frequency of flood flows. In order to derive the probability of occurrence of any flood event, the frequency distribution, which can best describe the past characteristics on the magnitude and the probability of occurrence of such floods, must be known. This involves the determination of the best flood frequency model, which can be fitted to the available historical record. The distributions used in this study include five distributions: generalized logistic, generalized extreme value, generalized normal, Pearson type III and generalized Pareto. Initially the study region as a whole was assumed as a hydrometric homogeneous region, that it was confirmed using the discordance and heterogeneity measure. Based on the L-moment ratios diagram, the Hosking and Wallis goodness-of-fit statistical criterion, the Generalized Logistic distribution is identified as the most appropriate distribution for the homogeneous study region.

Seasonal Variation of Heavy Metal Bioaccumulation in the Tissues of Ruditapes decussatus from Cardak, Canakkale-Turkey

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Abstract. Large quantities of metals have been released in the worldwide environment by human effects such as agricultural and aquacultural activities, municipal wastes and domestic sewages. In this study ten heavy metals (Cu, Cd, Co, Cr, Zn, Fe, Pb, Al, Mn and Ni) were examined to test seasonal differences as a function of anthropogenic activities and consider potential human health risks. In this purpose, widespread clam species Ruditapes decussatus were collected seasonally (February, May, July and October 2010-2011) from their natural habitats, Cardak Region. According to the findings, Zn, Fe, Al and Mn levels were exceed critical concentrations enforced by Turkish legistration and European Commission in the samples which collected in May and July. Fe and Zn levels were high in either October or February samples. Additionally, Al concentrations were found exceed legal limits in October samples. These results have implications for the use of clams (*R. decussatus*) which are seasonally monitoring of heavy metals in the marine environment.

Determination of Genotoxicity of Tunca River (Edirne-Turkey) Water and Sediment with *Allium* Test System

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Abstract. Tunca River that is born in Bulgaria and pass through Edirne (Turkey), is contaminated with agricultural activities and domestic sewages. The aim of this study was to determine genotoxic potential of Tunca River water and sediment samples with Allium test system. Samples were taken from 4 sites in September 2012. Three different concentrations (25%, 50% and 100%) were prepared for each sample to evaluate chromosome aberrations in *Allium cepa* root cells. Roots were exposed for 72h and then observed by light microscope. Results showed that the both water and sediment samples that taken from Edirne city center had a genotoxic effect and increased on mitotic index in A. cepa root cells. Other sites did not have a significant genotoxicity.

Metal Concentrations in Mantle Tissue of Some Aquatic Invertebrates from Umurbey, Canakkale-Turkey

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Abstract. Many regions of Canakkale appear to be contaminated with organic pollutants and heavy metals, affecting the biological systems. Environmental exposure of aquatic organisms to heavy metal pollutants may be determined by measuring external levels of a selected set of well-known metals in the surrounding water and some tissues of aquatic organisms. The aim this study was to monitor heavy metal pollution in the Umurbey, a region of Dardanelles Bosphorus, Turkey. The study was performed with *Mytilus galloprovincialis, Ruditapes decussatus, Ostrea edulis, Pecten maximus, Tapes decussatus* and the samples were collected in October 2010. Concentrations of eight heavy metals (Cr, Pb, Ni, Fe, Cu, Zn, Al and Mn) were observed in mantle tissues of these organisms. Among the determined metal levels, only Fe exceed the maximum critical concentrations enforced by Turkish legistration and European Commission. However, Zn, Al and Mn levels were found to be higher in all species, except *M. galloprovincialis*. According to these results, we also suggest that this region has a potential toxicity risk to the biological organisms and ecological sources.

Preliminary Investigation on Heavy Metal Pollution in *Pecten maximus* in the Dardanelles Bosphorus, Turkey

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Abstract. The king scallop (*Pecten maximus* L.) is a marine bivalve mollusc and popular economic foodstuff. The aim of this study was to monitor heavy metal pollution in the Dardanelles Bosphorus and to exhibit bioaccumulation in *P. maximus*. Sampling of *P. maximus* was performed in the beginning October 2010. Concentrations of ten heavy metals (Fe, Ni, Cu, Zn, As, Co, Cd, Hg, Pb and Mn) were determined in digestive glands of *P. maximus* collected from 4 stations (Karacaören, Umurbey, Çamburnu and Eceabat) located on the Dardanelles Bosphorus coasts. Heavy metal content was determined by Inductively Coupled Plasma-Atomic Emission Spectrometer (ICP-AES). In addition, physico-chemical parameters of marine water were analysed. According to the results, Zn, Al, Fe and Mn contents of *P. maximus* digestive gland were determined to exceed legal limits by Turkish Fisheries Regulation and European Commission at two stations, Karacaören and Eceabat. However, only Zn levels showed significantly higher concentrations at all stations. In conclusion, *P. maximus* in Umurbey and Çamburnu were found suitable for human consumption; nevertheless, Zn levels should be closely monitored in the future.

Some chemical characteristics (Chemical composition) of sediments from carp fishponds exposed to different type of fertilization

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Abstract. The bottom sediments of earthen carp fishponds with mineral or organic manuring and area from 0.38 to 7.0 hectares were analyzed. The analyses included basic chemical characteristics of the 0-0.15m surface silt layer like organic matter and organic nitrogen in percentages of dried substance, ammonium and nitrate nitrogen in mg.kg-1 dried substance again. The sediments of the fishpond fertilized with ammonium nitrate showed highest concentrations of ammonium and nitrate nitrogen. There was an increased level of organic matter in sediments of organically manured and of control fishponds with area of 0.23 and 7.0 hectares correspondingly. The control fishpond showed higher level of organic nitrogen than the others. The degree of macrophyte coverage determined the content of organic matter and organic nitrogen while the kind of applied fertilizer influenced the concentrations of inorganic nitrogen forms in sediments.

The Concentration of Some Metals in Soil and Species *Helleborus multifidus* subsp. *serbicus* (Adamovič) Merxm. & Podl. on One Serpentine Locality (Serbia)

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Abstract. The aim of presented research was to assess the content of eleven metals (Ca, Mg, Fe, Mn, Cu, Zn, Ni, Pb, Cd, Co, Cr) in species Helleborus multifidus subsp. serbicus (Adamovič) Merxm. & Podl. and serpentine soil where it grows. The concentrations of examined metals were higher in soil than in plant (except Ca). The metal concentration in the soil was: Mg>Fe>Ni>Ca>Cr>Mn>Co>Pb>Zn>Cu>Cd, and in the plant Ca>Mg>Fe>Ni>Mn>Zn>Cr>Cu>Co>Cd>Pb. The metals had BCF<1 (except Ca). Our study exhibited different metal concentration in investigated species, depending on kinds of metal, and metal uptake does not necessarily correlate with metal content in the soil.

Genome instability of *Chironomus riparius* Mg. (Diptera, Chironomidae) from polluted water basins in Bulgaria

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Abstract. Larvae of Chironomus riparius Mg. (Chironomidae, Diptera) collected from two polluted water basins in Bulgaria, the Maritsa and Chaya Rivers (adjacent to Plovdiv and Asenovgrad respectively), a small pool (near Plovdiv) plus controls reared in the laboratory were studied. High concentrations of the trace metals Pb, Cu and Cd were recorded in the sediments of all these polluted stations. Marked somatic structural chromosome aberrations and changes in the functional activity of Balbiani Rings and Nucleolar organizer were found in C. riparius polytene chromosomes from the field stations and their frequency was significantly higher ($P<0.01$) compared to controls. The observed somatic chromosome changes are discussed as a response of the chironomid genome to aquatic pollution.

A new cytogenetic index based on the number of aberrations found in larvae from polluted regions in comparison with the control was applied. This index will help to evaluate easily the presence and level of trace metal pollution in aquatic ecosystems. Our previous study of a polluted station near the River Chaya showed that the cytogenetic index was very high at 6.3 compared to 1 in a control site.

To determine the mechanism involved in the concentration of aberration breakpoints in some regions of chironomid polytene chromosome the FISH method was applied. The localization of a transposable element TFB1 along the polytene chromosomes of C. riparius was analyzed and compared with breakpoints of chromosome aberrations. A significant correlation ($P<0.05$) was found which shows that most of the aberrations do not appear randomly in the polytene chromosomes of chironomids.

Climate Chance: The Impact on Urban Climate in the Municipality of Plovdiv

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Abstract. A large number of studies have shown that climate change has a great impact of urban climate and human health. Many of the activities provided depend heavily upon appropriate climatic, and associated environmental, conditions. However, many of these conditions are projected to change, possibly quite substantially, in future decades. The purpose of the study discussed here is to determinate and analyzed the effect of climate change on the air temperature, humidity and rainfall in urban area of Plovdiv during the last five years. The main results were represented by summer and winter conditions, by extremes temperatures measuring every day conditions.

Hydrobiological investigation of the activated sludge from aeration tanks of cyclical type in WWTP–Hisarya

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Abstract. The operations of the relatively new waste water treatment plant of Hisarya, Bulgaria were evaluated in the present paper. The bacterial diversity of activated sludge from aeration tanks of cyclical type (SBR-method) during the seasons was studied. The Cyclic Activated Sludge System is one of the most popular sequencing batch reactor (SBR) processes. The hydrobiological characteristic of the activated sludge was performed with regular observations by using light microscopic examinations, but also by evaluation of the flocculation ability and settleability. The presence of positive bioindicators - Aspidisca and Epistyllis species during the investigated period of time (2012 Year) was established, which confirmed the gut purification of the waste water and the carrying out of the nitrification process. Moreover, the results obtained demonstrated that the performance of the SBR maintained high level, and the SBR system remained stable during this study.

Biological treatment of waste water in aeration tanks of cyclical type

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Abstract. In the present paper the operation of WWTP – Hissar, which includes a biological stage with aeration tanks of cyclical type (SBR-method), was studied. The values of the standard indicators of input and output water from the waste water treatment plant were evaluated. Moreover, the achieved effects due to the biological treatment of the water in terms of the COD (95.7 %), BOD5 (96.6 %), total nitrogen (81.3 %), total sulfur (53.7 %) and solids (95.7 %) were established. It was concluded that the indexes of the treated water were significantly below the emission standards specified in the discharge permit.

Using of composting for achieving of agricultural and environmental sustainability in Kyustendil region

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Abstract. There are more than 2000 illegal landfills on the territory of Bulgaria, which must be closed or set in order to EU requirements. Municipality of Kyustendil must decide in short terms the ecological problems of the landfill near to village Radlovtsi. The present paper has an aim to bring the science for help into the practice for taking of decisions by the local government about determination of the ways for processing of the waste in Kyustendil municipality. The study argues the advantages of building of waste processing plant.

The amount of the domestic waste in Kyustendil region is about 72 000 t per year. Main components might be recycled for second using. Only that part of the waste, which ca not be recycled should be placed in landfills, but the organic waste is necessary to be processed for compost. Its amount will be more than 14 400 t per year.

The strategy for waste management must be a part of the strategy for sustainable development of the region. Sustainable development means to satisfy our present needs, without any risk for satisfying the needs of the future generations.

The sustainable agriculture includes three main aims – environmental protection, economical income and social equality. Present study gives us imagine about the areas of utilization of the organic compost. Utilization of composting in agriculture as a good practice for achieving of sustainable development, through its using as organic (ecological) fertilizer for increasing of the crops and achieving of social effect about the right of every individual to feed.

Utilization in environmental protection for re-cultivation of terrains and especially for destroyed from mining activities terrains. The compost might be used as a component in purifying technologies for cleaning of air, water and soils.

The compost is used in the economy, because it is one of the cheapest ways for processing of waste in comparison with incineration and deposition in landfills and as a final product it is a raw material for the industry and agriculture and in this sense it is a source of incomes.

The diagrams show the place of the composting in the Sustainable Development Diagram, at the place where the three spheres: social, economical and environmental crosses each other.

Main conclusion is that the composting is obligatory method for processing of the organic part of the waste for achieving of sustainable development, including sustainable agriculture, environment and economy.

Quality of the water of Novoselska River, intended of the future reservoir Kyustendil

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Abstract. In the southwestern part of the village Slokoshtitsa where the Novoselska river enters into the unfinished cup of the future dam Kyustendil through a tunnel in one of the foothills of Osogovo mountain the water has a temperature of 10.2 º C, although this is the first point of our study, and the air temperature is still low 12 º C. The acidity of the water is normal and in range from pH = 7.02 to pH = 7.55, with a slight increase in alkalinity at the unregulated dump sites for household and construction waste in sampling points 8, 9 and 10. The water is most neutral at the entrance of the village, and is most alkaline at the end of the study interval at the bridge next to the main road Kyustendil-Dupnitsa. Conductivity is relatively stable and does not change as the lowest measured value is EC = 0.66 μS in point 6 and the highest in point 3 respectively 1.43 μS, it is higher in areas around the dump sites points 1 and 8. The total amount of dissolved sulfur TDS is within the normal range, with low concentrations of dissolved sulfur ranging from 50 to 169 g/t (ppm). Again the highest content was observed around the dump sites and soon after the cup of the dam, which has musty, swampy water. Nitrates and nitrites weren't established, which means that there is no application of fertilizer this season. There is presence of total, free and combined chlorine (Cl), but in low concentrations from 0 to 0.12 mg/l for the free chlorine, total chlorine from 0 to 0.12 mg/l and combined from 0 to 0.14 mg/l again around the dump sites. Particular attention should be paid to cyanuric acid which is in quantities of 6 to 22 mg / l, absent only in the first measurement point where the water enters the village clean. Along the rest of the study area of the river water contains cyanuric acid, which is a product of the chemical industry as detergents, disinfectants, adhesives and more. This water is not fit for direct consummation and livestock watering, also the irrigation of agricultural areas may be a problem. Cyanuric acid induced diseases of the urinary system, the formation of crystals in the kidneys and the urinary tract. The water in the Novoselska River has medium to high total alkalinity (hardness CaCO3). The content of calcium carbonate ranges from 50 to 88 mg/l and it is higher around the dumpsites where there is thrown construction waste - lime, concrete, cement, ceramics. The amount of free, combined and total copper Cu is not high, but systematic irrigation of agricultural areas may enrich the soil with copper and so reach the limit values for soils under D.V. number 54 from 1997. For slight acidic and neutral soils under 250-260 mg/kg and the acidic soil much lower. Free copper varies between 0 and 0.24 mg/l, total copper from 0 to 0.51 mg/l and combined copper from 0 to 0.34 mg/l. It rises around the dumpsites. Iron Fe is in low concentrations from 0 to 0.13 mg/l, again the highest concentrations are in the points at the dumpsites or immediately after them.

Radioactivity of the water, the sediment and the total radiation are within the natural background as the area fluctuates around 0,16 μSv/h.

Changes in the Trophic Structure of Soft-Sediment Macrozoobenthic Communities as an Indicator for Disturbance in Coastal Marine Ecosystems in Sozopol Bay (South-Western Black Sea)

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Abstract. Modifications of the structure and organization of macroinvertebrate communities are commonly used in monitoring as indicators of the level of disturbance of coastal marine ecosystems. This study uses the changes in the trophic structure of soft-sediment macroinvertebrate communities in Sozopol Bay (south-western Black Sea) to examine their response to anthropogenic disturbance caused by a sewage wastewater outfall. Macrozoobenthos was sampled in July 2012 at 3 sites situated at an increasing distance from the outfall. The abundance of 6 major trophic groups was determined: carnivores, herbivores, omnivores, suspension feeders, surface deposit feeders and subsurface deposit feeders. The proportion of deposit feeders and carnivores tended to increase closer to the outfall, while the proportion of suspension feeders decreased. Conversely, the relative abundance, number of taxa and Shannon-Wiener diversity were highest at the site closest to the outfall. These results seem to indicate a moderate level of disturbance of the macroinvertebrate communities, where the most selective, sensitive taxa start to disappear and are replaced by non-selective taxa, but without drastic alterations that would lead to an impaired functioning. The functional group approach is a useful supplement to other metrics used in ecological assessment of coastal marine ecosystems and can contribute for a better evaluation of their functioning.

Bioaccumulation of heavy metals in the game in the region of Stara Zagora, South Bulgaria

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Abstract. We have examined individual samples of game from the region of Stara Zagora.

The accumulation of heavy metals has been studied in the muscles and the internal organs of six different species of mammals classified in four families - Canidae (*Vulpes vulpes,Canis lupus* and *Canis aureus*); Felidae (*Felis sylvestris*); Mustelidae (*Meles meles*) and Leporidae (*Lepus europaeus*).

The samples taken from the muscles of *L. europaeus* showed high values of Cu – up to 2.22 mg / kg; Zn - up to 1.39 mg / kg and Ni - up to 1.90 mg / kg. Increased values of Zn and Ni have been found also in the internal organs of the species - respectively 1.46 mg/kg for Zn and 1.75 mg/kg for Ni.

The highest values of heavy metals between the predators are observed in the samples taken from the muscles of *V. vulpes* (up to 1.90 mg/kg of Mn and 1.15 mg/kg of Pb) and of *C. aureus* - up to 11.35 mg/kg of Fe. The concentration of the same elements is high also in the internal organs of both species. In the samples of *V. vulpes* the quantity of Mn reaches 1.27 mg/kg, of Pb - 0.94 mg/kg and in the samples of C. aureus the quantity of Fe is up to 10.57 mg/kg.

Determination of Mineral Composition in Two Fish Species Roach (*Rutilus rutilus*) and Bleak (*Alburnus alburnus*)

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Abstract. Purpose: The purpose of this study is to evaluate the mineral profiles of two fish species for human consummation.

Approach: Two fresh water fish species roach (Rutilus rutilus), and bleak (Alburnus alburnus) were chosen and collected from the dam lake Zhrebchevo in Bulgaria. Determination of copper (Cu), iron (Fe), nickel (Ni), lead (Pb), zink (Zn), manganese (Mn), chromium (Cr) and cadmium (Cd) was performed with electro thermal atomic absorption spectrometry (ETAAS).

Findings: The mineral concentration in edible parts of fish species were found to be 0.692±0.128-0.588±0.032 mg/kg for Cu, 6.592±0.224-7.344±0.142 mg/kg for Fe, 0.042±0.012-0.033±0.025 mg/kg for Ni, 0.067±0,031-0.059±0.044 mg/kg for Pb, 5.456±0.388-4.049±0.263 mg/kg for Zn, 0.490±0.061-0.720±0.086 mg/kg for Mn, 0.097±0.045-0.089±0.036 mg/kg for Cr, 0.013±0.027-0.010±0.034 mg/kg for Cd.

Conclusions: This paper is helpful to consumers and academics concerning the mineral composition of two fish species.

Green spaces in the surroundings of St. George University Hospital-Plovdiv as a subjective promoter for hospitalized patients' health – a pilot study

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Abstract. The concept of a positive association between the presence of green vegetation near hospitals and the healing process dates back to ancient times. In the recent decades, the cooperation of architects, physicians and environmentalists made a revolution in the philosophy of hospital construction with the so-called evidence-based design. No information about the patients groups that would benefit the most of its implementation in the Bulgarian socio-demographic conditions was found. The aim of this study was to look for a model predicting the patient's profile corresponding with a positive interaction with the green spaces around the hospital. Cross-sectional study was conducted among 150 patients hospitalized at the St. George University Hospital, Plovdiv, the largest tertiary hospital in Southern Bulgaria. The survey was conducted via the method of structured personal interview, using a specialized questionnaire. The results were processed using statistical methods and graphical analysis. They showed a significant positive response in 72.1% ($p<0.001$) of the patients: in 84,4% ($p<0.001$) of the women, in 93.3% ($p<0.01$) of those aged 30y., in 80% ($p<0.01$) of those treated in therapeutic wards and in 77.6% ($p<0.05$) of those living in a city. In addition, the regression model showed that the significant factors of the patient profile, determining a favorable interaction with the park, were gender, type of the ward, the presence of a frequent visitor and age. The results present an ecological approach to the person-centered medicine in Bulgaria that could significantly improve the quality of the medical care.

Environmental Problems with Solid Waste in Municipalities of 10 to 50 Thousand People

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Abstract. At present the problem of storing and disposing of solid waste /MSW/ is determined solely by their disposal in landfills /dumps/.

In this study, information was collected on the status of regulated landfills in Bulgaria and to the composition of waste in them. Difference exists in the morphological composition of MSW between the two municipalities. This is the reason, solving the problem of household garbage in different communities is radically different. This difference has the answer on how to deal with waste in the municipalities. Need to adopt an approach to separate municipalities on the basis of population. Most affected in this regard are small and medium-sized municipalities between 10 and 50 thousand inhabitants.

The proportion of the population in the municipalities between 10 and 50 thousand inhabitants is around 33%. 41% of the population of Bulgaria have no lasting solution to the problem of solid waste. This requires the development of programs to manage solid waste in these areas.

Ecological Assessment of the rivers Luda Yana and Banska Luda Yana as Based on Selected Biological Parameters

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Abstract. The hydrobiological study of the Luda Yana River, and its right tributary - the Banska Luda Yana River, has been performed seasonally in 2011. Ecological status of the both rivers was analyzed according to the basic biotic indices, characterizing the composition and structure of the macrozoobenthic communities.

The taxonomic structure and density showed that the bottom invertebrates (macrozoobenthic) community was heavily disrupted and the saprobic index fluctuated around α-mesosaprobity probably as a result of municipal organic loads and the industrial wastewaters. The effects of the heavy metals pollution, incidentally occurred in the Banska Luda Yana River and originating most probably from the Assarel-Medet JSC, were discussed.

Study the effects of sludges from pulp and paper industry on corn in laboratory experiments

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Abstract. Sludges which are produced from waste-water treatment facilities represent a serious environmental problem in terms of their storage. However, they also represent an organic reserve, biomass rich in macro and micro nutrients for soils. Thus, sludges could be used to recover the balance of organic matter in soils. We aimed in the present study to determine the influence of sludge produced from a pulp factory on the development of corn (*Zea mays*) in laboratory conditions.

СЕКЦИЯ „ЕКОЛОГИЧНО ОБРАЗОВАНИЕ И ЗАКОНОДАТЕЛСТВО”

SECTION “ECOLOGICAL EDUCATION AND LEGISLATION”

Education for Sustainable Development in Bulgarian Parks

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Abstract. The need for education in environmental protection was signified in the earliest international treaties in the area. Stipulated requirements were later transposed into European directives and subsequently into national legislation. From 1970 to 1992, the environmental education developed with an emphasis on nature conservation. Only after the Earth Summit in Rio de Janeiro, the focus moved to the education for sustainable development.

Education for sustainable development is the next generation of environmental education and is based on new ways of thinking and new methods of learning.

Bulgarian school education offers inadequate knowledge about the environment with no outdoor experience, a study by the National Center for the Study of Public Opinion says. At the same time, the Administrations of Nature and National parks are obliged by law and financially secured to perform educational activities. Parks are perfect non-formal educational centers due to their remarkable educational resources, the natural learning environment and the fact that they are a territorial sustainable development model.

Educational and communication activities in Bulgarian parks are currently developed in three areas: information infrastructure – visitor centers and interpretive trails; informational and promotional materials and events; and educational initiatives. Educational initiatives usually include lectures, film screenings, "en plein air" for artists, competitions, etc., mainly based on conservative traditional teaching methods when learners remain passive.

In order to respond to the need for development of "knowledge, skills, attitudes and values necessary to shape a sustainable future" through education for sustainable development, a new approach in the implementation of educational initiatives in Bulgaria is needed. An approach which uses nature as an educational tool and provides experience-based learning is the subject of a future research.

Possibilities for Enrichment of Environmental Education with Environmental Aspects of Consumer Education

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Abstract. In the material is presented educational research on environmental education in the context of consumer education and the possibilities for its application in school biology training.

There is a theoretical background of the researched problem and educational experiment carried out in real school conditions.

On the basis of the overall study, conclusions have been drawn on the possibilities for the integration of consumer education into the school training in biology.

Projections of Environmental Ethics in Environmental Education

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Abstract. The importance of environmental ethics as the basis for environmental philosophy changes the trends of ecological thinking, which is particularly useful in respect of environmental education. Environmental ethics provides new opportunities to transform environmental education, by providing solid ethical arguments for the regulation of people's attitude towards nature and their behavior in the environment.

In the material are presented arguments and guidelines for enrichment of environmental education in an eco-ethical aspect. An empirical study on the presented problem is described.

The Theme "The Food Contamination" in the Biological Preparation of Students

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Abstract. Conducted a survey on the awareness of young people about the risk factors for contamination of foods and their impact on human health. Respondents were 190 students from four schools in Plovdiv aged 14 - 18 years. The knowledge of the youth were examined about types of food contamination, potential health effects and the ways of the prevention of the contaminated food, as well as the influence of age and gender on the attitudes of respondents to the questions. On the basis of the made conclusions is analyzed the possibility of integrating knowledge about contamination of food in Biology Teaching of students -5th - 10th grade.

Biosemiotics as a Possible New Paradigm in Theoretical Biology

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Abstract. The theory is a major element of the scientific knowledge because it provides complete concept for the investigated object and allows understanding of its essence /meaning/. The fundamental problem of Theoretical biology /TB/, as an interdisciplinary scientific field, is to createa complete theory of life– a premise to understand and preserve life. This outstandingly difficult task has not been solved yet, despite the use of different methods /physic-chemical, systemic, evolutionary/ and private theories in biology. The reason for the theoretical stagnation in biology is the unique complexity of the phenomenon of life existing as an integral natural phenomenon.This fact and the acuteness of present-day global ecological crisis accelerate the quest for principally new, integrative methodological approaches, which could be considered as a contemporary paradigm for formation of TB. One of them is BIOSEMIOTICS. The semiotics, also called “Theory of signs” or “The nature as a language”, is a science for the sign systems in nature and society. The sign system is a system that provides information. Biosemiotics is considered as a common root of biology and semiotics is an interdisciplinary scientific field. It investigates information processes at all levels of organization of life /from molecular genetic level to social level/ and interprets them as signs. Information sign processes are considered as a fundamental system of the phenomenon of life. Biosemiotics has theoreticalpracticaland philosophical meaning.

Knowledge and Attitudes Towards the Water in the 5th, 6th and 7th Grade Education

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Abstract. The system of the knowledge and attitudes are basic components of students' ecological culture which is formed and enriched through training in natural science subjects.

In connection with the International Day of the Water the Center for Chemical Demonstrations (Faculty of Chemistry, University of Plovdiv) organizes a competition on the topic "March 22 – the Day of the Water". The aim of the competition is the preparation of a poster, computer presentation, drawing, story from students in the 5th, 6th and 7th grade. The competition is held in 2011/2012 and 2012/2013 years.

Object of the research is the content of the posters and computer presentations (total 147) because the information about the water is the most abundant in them.

Content analysis research methodology is used. Through it is sought conformity between the aims of education in the curriculum (knowledge and attitudes of the students towards the water) and students' performances. Statistical analysis on the results of the research shows that education on the school subjects "Man and Nature" (5th and 6th grade) and "Chemistry and Protection of the Environment" (7th grade) creates a good basis for integration of knowledge and attitudes towards the substance water in the students' mind.

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БЕЛЕЖКИ / NOTES