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ABSTRACTS

XIV. Student's Conference of Biological, Ecological and
Geological Themes
15th February 2017



BRNO 2017

Masaryk University
Faculty of Education

***XIV. Student's Conference of Biological,
Ecological and Geological Themes***

15th February 2017

ABSTRACTS



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Program

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Collection of grass species (Poaceae) for education

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Algal flora of wetland natural sight Bašnov on Kroměřížsko

Michal Forýtek

This thesis deals with the analysis of the generic representation of communities of algae wetland nature sight Bašnov near the village of Střížovice near Kroměříž. These are the ponds, wetlands and shallow natural depression floodplain of the Morava River. In growing season 2016, there was in three terms sampled algae and measured physico-chemical parameters of water at 4 sampling sites of wetland. Altogether wetland natural sight Bašnov recorded 159 taxa of cyanobacteria and algae. In spring, Euglena was most represented. Overall, throughout the season the most numerous were diatoms. The work will discuss changes in communities of algae during the growing season 2016 and the occurrence of taxa in relation to different types of wetland habitats.

Key words

cyanobacteria, algae, diatoms, phytoplankton, wetland, natural sight Bašnov

Influence of revitalization of selected ponds in the PLA Žďárské vrchy on the diversity of amphibians

Šárka Chaloupková, Zdeněk Řehák

Influence of revitalization of the ponds Trna, Křivka, Němec on species was researched in this thesis. The ponds are located near to Nové Město na Moravě. The revitalization was carried out since 2014 to 2015. The objective of the thesis has been to gather information about recolonization of organisms living in the ponds and to investigate ontogenetic stages of amphibians living in the ponds and their surroundings.

Information gathered before and during the revitalization will be compared. The examinations were made by field observations. The habitats were observed weekly since April 2016 to November 2016 but at the end of a season they were observed twice per month. The aquatic organisms were sampled from wetlands in predicted spots. In the ponds, abiotic environmental factors were monthly measured, e.g., the amount of dissolved oxygen in a water body, water electrical conductivity and water and air temperature, pH value of water. The necessary water samples were collected in the selected spots and were analysed later using an optical microscope so that the microorganisms found in the water samples could be identified. The identification of

macrofauna was performed using morphological features and acoustic recordings. However, the identification can be not-exact.

Data for comparison were achieved before and during revitalization in 2014-2015. The bottom mud from the ponds was removed gradually for supporting of the surface areas.

In total, eight amphibian species has been recorded earlier, e.g., the common toad (*Bufo bufo*), the European green toad (*Pseudepidalea viridis*), the common frog (*Rana temporaria*), the pool frog (*Pelophylax lessonae*), the edible frog (*Pelophylax kl. esculentus*), the alpine newt (*Ichthyosaura alpestris*), the smooth newt (*Lissotriton vulgaris*), and the great crested newt (*Triturus cristatus*) were recorded.

Only six amphibian species were obtained in the season 2016. Two species were missing compared to a former research in 2014 and 2015, i.e., the European green toad (*Pseudepidalea viridis*) and the great crested newt (*Triturus cristatus*). The pool frog (*Pelophylax lessonae*) has been the most commonly found species since the half of May to the half of July 2016. The first frogspawn was found on 3rd of April 2016 and observed eggs pertained to the common toad (*Bufo bufo*). Tadpoles of further species, the common frog (*Rana temporaria*) have been recorded since April to the beginning of July. Larvae of newts were found since July to August and young metamorphosed individuals have been evolved from 2 to 4 months after hatching. The high abundance of the common toad and the common frog near water bodies appeared only in the spring in the period of reproduction. An abundance of the pool frog and the edible frog was high since reproduction time to the end of the season.

Influence of the revitalization has been demonstrated by the decrease of numbers of studied species. Absence of the European green toad and the great crested newt can be caused by their fading away.

The results will be given to workers of PLA Administration Žďárské vrchy to help them to evaluate the efficiency of revitalization. This study may be also utilized for establishment of educational nature trails for elementary and secondary school students.

Key words

revitalization, PLA Žďárské vrchy, ponds, amphibians, diversity, bank belt, recolonization

Body constitution's evaluation of sports and non-sports pupils of upper primary school focused on body fat content

Blanka Ella Jasinková, Martina Jančová

The bachelor's thesis focuses on a body fat content of pupils on upper primary school. It deals with the question whether there is a difference in body fat between students who regularly do sports and those who do not sport at all.

In the theoretical part the problem of childhood obesity is analyzed as well as causes of obesity and diseases that it can cause. The prevention and treatment of obesity is also mentioned. The practical part of the thesis is focused on own research which comprises two parts – a questionnaire and measurement. The questionnaire asks the eating habits of pupils and their attitude to sport. Measuring on personal scale TANITA finds out the body fat content of pupils.

Key words

body constitution, body fat, obesity

Algal flora of ponds Horní rybník and Dolní rybník in the village Popůvky near Brno

Michaela Němcová

Bachelor thesis is dealing with the algal flora in two ponds in the Popůvky village near Brno. The Pond Dolní rybník is used for fish farming and sport fishing, while the pond Horní rybník is not.

The theoretical part contains a description of ponds and sampling sites. Sampling of phytoplankton and phytobenthos and abiotic parameters of water measurements were carried out in four dates in 2016. In total, 226 taxa cyanobacteria and algae were recorded (the pond Horní rybník 162 taxa and pond Dolní rybník 143 taxa). The difference in species and semi-quantitative representation of algae and cyanobacteria in ponds will be discussed.

Key words

cyanobacteria, algae, diatoms, phytoplankton, phytobenthos, pond, Horní rybník, Dolní rybník, Popůvky

Monitoring of a mother's colony of the Greater Mouse-eared Bat in the Luhačovice castle

Lukáš Novák, Zdeněk Řehák

All bat species have been protected by a law in the Czech Republic. Similarly as in other European countries, a long-term monitoring of bat populations has been also organized in the Czech Republic. It has been focused on the size of bat populations and their changes and comprised the counting of bats at hibernacula and at summer colonies, bat detecting, netting and radio-telemetry and other methods of observation of bats.

This study can be divided into two parts. The first one represents theoretical introduction to problems of distribution and occurrence of particular bat species focused on the area of the Zlín region with the aim to summarize all published information and to form a brief review of the bat occurrence.

The second one was concentrated to the field research of the large summer colony of the Greater mouse-eared bat, *Myotis myotis*, critically endangered species representing the greatest colony in Moravia and Silesia, roosting on the loft of the Luhačovice castle where almost 3000 adult females with their juveniles every year occupied the same wing of the loft. The roost of the colony can be divided into two parts. Bats can use either back isolated part or main front part, which are separated from each other by a walled partition with a closed door. The both parts of the roost have its own dormer opening for leaving or returning of bats.

The research was based on the method of long-time continuous observation using IR camera's systems. The first system was sited in the back part of the roost and consisted of two IR cameras and an IPCorder connected each other via network cables. The second system was located in the front part of the roost and consisted of a further IR Camera connected with a another PCorder.

This method was added with making photos of the whole colony to count all bats correctly, but every part of the roost separately. This photo-census was performed weekly from the beginning of May to the second half of October. In addition, air temperature and humidity were measured by two Hobo dataloggers located in each part of the colony roost.

A relation between the number of bats, their relative activity (number of movements per hour) and values of air temperature and humidity on the loft was assessed. Differences in variable values between the both loft parts were compared each other. Relative activity differed since a season (periods of lactation, postlactation and autumn movements), day time (day/night) or air temperature and humidity.

Keywords

Zlín region, Luhačovice, castle loft, Greater mouse-eared bat, *Myotis myotis*, summer colony, the size of a colony, bat activity, environmental influence

Seasonal succession of cyanobacterial water bloom in Luhačovice reservoir in Zlín region

Klára Pištěcká

The development of a cyanobacterial water bloom was studied in the Luhačovice reservoir. The main aim of this work was to record the creation of the cyanobacterial water bloom in the growing season of the year 2016. Samples of phytoplankton were collected and environmental factors were measured regularly during the growing season at two sampling sites. In total, 60 taxa of phytoplankton were discovered (of which 10 were taxa of cyanobacterial water bloom). The highest number of taxa of cyanobacterial water bloom was observed in July and August (8 taxa). The highest occurrence of cyanobacterial water bloom was measured in July (1,423 thousand individuals/liter). The most abundant taxa of cyanobacterial water bloom was *Anabaena spiroides*. The first cyanobacterial water bloom in the season 2016 was observed on 22nd May 2016 (water temperature was 18,7 °C). The impact of environmental factors on the creation and the development of cyanobacterial water bloom will be discussed in the thesis.

Key words

cyanobacteria, algal bloom, seasonal succession, Luhačovice reservoir, CHKO Bílé Karpaty

Work sheets for primary school pupils to Brno Zoo's project: "Biodiversity is Us!"

Eliška Procházková, Zdeněk Řehák

The aim of this bachelor's thesis is to lead primary school pupils towards recognition and protection of biodiversity through Brno Zoo's project: "Biodiversity is Us!". In the theoretical part of the thesis biodiversity, World Associations of Zoos and Aquariums, IUCN Red List and the animals on the nature trail in Brno Zoo are characterized. The thesis also deals with a methodology of creating work sheets and the placement of the term biodiversity in primary school curriculums. In the practical part of the thesis, work sheets for primary

school pupils and methodical sheets for teachers are created. The results of a research of the pupils' knowledge are evaluated in the thesis in the form of graphs.

Key words

biodiverzity, ZOO Brno, WAZA, IUCN Red List, Curriculum, work sheat

Natural conditions and flora of area on the western edge of Brno reservoir

Petra Svobodová, Mgr. Natálie Čeplová

The bachelor's thesis characterizes natural conditions on the western edge of Brno dam and is a part of a long-term mapping of the city of Brno led by doc. RNDr. Zdeňka Lososová, Ph.D.

The theoretical part includes geological, geomorphological, climatic, hydrological and pedological characteristics of the territory. The practical part focuses on a research of the flora of given area.

The study area is defined by the squares nr. 6764-D-B-a and 6764-D-B-b of the Central European grid mapping with total surface about 5 km². Studied area is located in the natural park Podkomorské lesy, for this reason flora is relatively homogeneous. The climate is dry and moderately warm. The whole area belongs to the Morava river basin. The most widespread soil types are cambisol and brown soils.

During the field research 102 species of vascular plants were found. All species found are documented as herbarium specimens.

Key words

Brno dam, vascular plants, flora, natural conditions, vegetation

Collection of grass species (*Poaceae*) for education

Zdeňka Zámečnicková, Natálie Čeplová

This bachelor's thesis concerns with the taxons of the *Poaceae* family (grasses), their apperance, occurrence and importance in nature. Besides the characteristics of the family, the thesis includes a description of selected species. Characterized species are included in the enclosed herbarium, which is in the form of the items in A3 format. The thesis also includes a research of biology textbooks for elementary schools, in which the author focused on the list of grass species. This thesis will serve as a study material for the

course System and evolution of higher plants in the Department of Biology and also in author's teaching practice.

Keywords

herbarium, Poaceae, morphology, grasses

Algal flora of the reservoir Maršovské jezírko near Brno

Vendula Zavřelová

This thesis deals with cyanobacterial and algal flora of the reservoir Maršovské jezírko, which was created by flooding a former china clay quarries. In May, June and September 2016 there were on three different sampling sites ponds sampled for the benthic and planktonic algal and measured physico-chemical parameters of water. The pond Maršovské jezírko included 204 species of cyanobacteria and algae. Most representatives were recorded in diatoms. The greatest diversity of species was in the spring. Seasonal changes in taxonomic assemblages of algae will be discussed.

Keywords

algae, cyanobacteria, diatoms, phytoplankton, china clay quarry, reservoir Maršovské jezírko

Herbs and Medicinal Plants in Biology Classes

Lenka Grmelová, Kateřina Ševčíková

The Master's thesis deals with usage of herbs in Biology lesson at higher primary school. The main aim is to design a project day for the 7th grade pupils of primary school. The pupils will be taught via alternative teaching methods and didactic games how to use herbs in everyday life.

The theoretical part deals with the explanation of terms such as permaculture, herbs, Project Based Learning, Inquiry-Based Science Education and provides a summary of characteristics of the herbs used in the activities. The practical part is focused on the revision and continuous care of the "Garden for Health" in the workplace of the Department of Biology at the Faculty of Education MU. The plan and experimental verification of the project day in the school garden are described here. The didactic part of

the thesis includes a schedule of the project day, detailed methodology for teachers and printable materials for pupils. The outputs of the thesis could be used in Biology Classes at any primary school.

Key words

Herbs, Medicinal Plants, Permaculture, Herb Spiral, Health, Health 2020, Project Based Learning, Inquiry-Based Science Education, School Garden

Walks for birds in Brno

Filip Petřík, Boris Rychnovský

This diploma thesis, which is named Walks for birds in Brno, is divided into two main parts. The first part is focused on the comparison of results found in the diploma thesis, with result that I have found in the past during the bachelor's thesis. This part is aimed at confirming or disproving the numerical trends in these biotops.

The second part is focused on didactics and is connected with creating of worksheets for primary schools pupils, who will go for a walk to observe birds in the field. At least one walk will be practically tested with pupils of primary school.

Key words

birds, biotope, walk

Creating of instructional programme on subtopic of human biology in OpenSource and its testing on 8th grade pupils of primary school

Petra Petříková

This diploma thesis, which is named Creating of instructional programme on subtopic of human biology in Open Source and its testing on 8th grade pupils of primary school, is divided into two parts. The first part is focused on the theoretical background of the work. The second part is focused on creating of e-learning program and its testing on the 8th grade pupils of primary school.

Key words

e-learning, Wordpress ,digestive system, instructional program

Insects in textbooks for elementary school and making of entomological collection for teaching

Denisa Třešňáková

The main topic will summarize information about insect of the Czech Republic, which is comprised of textbooks for elementary schools and making of entomological collection. The diploma thesis is divided into three parts - theoretical, practical and didactic. The Theoretical part deals with characteristic of the insect, which is based on textbooks for elementary school. There will be methods of field-work described, mounting on pins and subsequent identification of selected insect. The making of entomological collection will be one of the parts too. In the didactic part there will be creating of worksheet, which will be used in lesson as a didactic tool.

Key words

insects, butterflies, beetles, Holometabola, Hemimetabola, entomological collection, didactic tool, product of nature Czech Republic

The proposal of teaching aids for teaching selected plant communities at elementary schools

Tereza Vachutková, Libuše Vodová

This master's thesis is focused on mapping the composition of the plant community in surroundings of the town Zábřeh. The results will be compared with the textbooks of biology and on the basis of this comparison the teaching aids for primary schools' education will be proposed. The masters thesis is composed of a theoretical and a practical part. The theoretical part is resulting from the expert background research focused on ecology, curriculum documents and textbooks of biology. It contents a didactic analysis of the textbooks of biology. The practical part is based on the field research of species composition of the three chosen plant communities (forest, meadow, water community). Each community has been examined in two localities, regularly visited in the interval of three weeks. The result of the practical part is a list of 262 species found in every particular locality. These species are compared with the species found in textbooks used to characterize every particular plant community, because of the comparison of the species' composition of plant communities of the region. The practical part contains a proposal of the teaching aids for education of the chosen plant communities at primary

schools. The verification of their teaching functionality will be realized in Primary School Školská in Zábřeh. The results of verification of teaching aids and recommendation to their amendment is described in the master's thesis as well.

Keywords

Plant community, Biology Classes, Teaching Aids, Textbooks of Biology

Radioactivity of the geological environment as a means of increasing of the environmental awareness of primary school pupils

Žaneta Vranková, Jindřich Štelcl

The thesis is aimed mainly on general issues of natural radioactivity of rocks and its connection with the so-called radon risk in the area of Brno City. Results of the gamma ray spectroscopy measurement of main rock types representing selected locations and didactic transformation of the processed issues involving realization of teaching at the elementary school are the part of this thesis.

Key words

natural radioactivity, gamma ray spectroscopy, radon, biomedical uses, ecology

The subject-didactical basis of outdoor teaching in biology

Iva Frýzová, Eduard Hofmann

Despite the fact that the notion of outdoor learning is not mentioned in publications focused on methodology of teaching biology at schools, this teaching strategy always was and still is exploit by teachers on both primary and secondary level of schools. For the purposes of the terminology bases analysis 20 publications dealing with methodology of teaching biology from 1948 to 2014 were analysed. The results of this analysis yielded the following findings:

Different authors focused on teaching natural sciences in their works mention various forms of outdoor learning, but the terminological definition of the concepts for individual authors differ significantly from the general term excursion, overarching all learning out of school, whether in outdoor or indoor, to very specific terms like determination plants and animals and geological walks.

There are also differences in the statement of the objectives of fieldwork. All authors stated in accordance with international publications development of knowledge, skills and attitudes towards nature. Only authors who published ed before 1967 also sees the goals in the area of social relations and meta-learning, which reflects current knowledge and research.

Analysis simultaneously helps formulate a barrier fieldwork, both in the area of organizational and scientific expertise. Among the organizational obstacles belong the number of pupils, distance of teaching place, finance and material equipment, but also taking into account the actual phenological and meteorological conditions. From the scientific expertise is mainly the assumption of a very good knowledge of local natural conditions.

The authors give a list of risks associated with outdoor learning related to the use of teaching strategies. This is too much physical demands of outdoor learning, overloading detail, the use of interpretation instead of active work of pupils, environmental disturbances and safety aspects in the teaching outside.

Fieldwork is irreplaceable, despite the increased demands of time, organizational and research in teaching biology, geology and geography. It gives the students direct experience with nature in an authentic environment and guides them to practice critical thinking based on the collection, analysis and interpretation of data.

Key words:

Outdoor learning, methodology of biology teaching, content analysis

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