

VIIIth Symposium of Baltic Coleopterologists



Kiry – Tatra National Park 10-12.06.2014

POLAND

Organized by:

Jarosław Skłodowski

– Warsaw University of Life Sciences, Forestry Faculty, Warszawa Poland

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– Tatrzański Park Narodowy, Poland

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– University of Warmia and Mazury, Olsztyn, Poland

Dear participants,

We are happy to welcome you to the 8th Symposium of Baltic Coleopterologists!

The Symposia of the Baltic Coleopterologists had their origin in Daugavpils, Latvia, where the first four meetings were organised. However, with the 5th Symposium of Baltic Coleopterologists, which took place in Szklana Huta in Poland in the year 2004, the Symposium changed to a different place. Subsequently it was organized every two years in different countries – in 2006 in Kaunas in Lithuania and in 2008 in Hyytiälä in Finland. Unfortunately, after this symposium a break happened and the meeting did not take place for several years.

Therefore, we are all the more happy to organize the 8th Symposium in Kiry in Poland. This place is located in the Tatra Mountains, the highest mountains in Poland, a region which is characterized by a rich cultural and folkloristic heritage – be it the music, the cuisine, the clothing or the mentality of the local people.

With our meeting we hope to reawake the tradition of a two years interval of Symposia of Baltic Coleopterologists and hopefully it will take place in 2016 in a new country.

Looking forward to meet you in Kiry,

Jarosław Skłodowski, Arvids Barsevskis, Tomasz Skalski,

Axel Schwerk, Paweł Sienkiewicz, Vytautas Tammutis, Agnieszka Kosewska

Conference programme

Thursday - 10th June

10.30 Welcome address

SESSION 1

Chairman: Arvids Barsevskis

11.00 – 11.25

Opportunities for the conservation of deadwood inhabiting beetles in seminatural forests

Ann KRAUT

11.25 – 11.50

Carabid beetles (Coleoptera: Carabidae) as an indicator of habitat changes along roadsides after road renovation

Izabela DYMITYSZYN

11.50 – 12.15

Distribution and spatial autocorrelation of carabid species in differently-treated post-agricultural areas

Axel SCHWERK

12.15 – 12.40

From military range to Natura 2000 area - soldiers protecting beetle species diversity in western Poland

Szymon KONWERSKI, Paweł SIENKIEWICZ, Anna MĄDRA

12.40 – 13.05

Areas on carbonate gyttia soils in the Olsztyn Lake District as specific habitats for ground beetles

Agnieszka KOSEWSKA, Mariusz NIETUPSKI, Bożena LEMKOWSKA

Lunch

SESSION 2

Chairman: Agnieszka Kosewska

14.30 – 14.55

Longhorn beetles (Coleoptera: Cerambycidae) of selected Natura 2000 sites along the upper reaches of Oder river - preliminary results

Wojciech SZCZEPAŃSKI

14.55 – 15.20

Revision of distribution and biology of *Agyrtes (Agyrtecanus) bicolor* LAPORTE, 1840 (Coleoptera: Agyrtidae) in Poland

Szymon KONWERSKI, Paweł SIENKIEWICZ, Marek BUNALSKI

15.20 – 15.45

Bibliography and notes on distribution of *Rhaesus serricollis* (Motschulsky, 1838) (Coleoptera: Cerambycidae: [Prioninae](#))

Sakine Serap AVGIN, Arvīds BARŠEVSKIS, Uldis VALAINIS

16.10 – 16.35

A review of the fauna of the long-horned beetles (Coleoptera: Cerambycidae) of Latvia

Arvīds BARŠEVSKIS, Serap AVGIN

Coffee break

SESSION 3 SPEED PRESENTATION

Chairman: Rikjan Vermeulen

16.55 – 17.15

Themes and trends over 10 years of Baltic Coleopterology using the text mining methods

Yuno DO

17.15 – 17.35

Two similar weevil species: *Otiorhynchus rotundus* Marseul, 1872 and *O. smreczynskii* CMOLUCH, 1968

Maksims BALALAIKINS

17.35 – 17.55

Results of using pheromone-baited traps for investigations of *Osmoderma barnabita* MOTSCHULSKY, 1845 in Latvia

Uldis VALAINIS

17.55 – 18.15

Harmfulness of the most abundant click beetle (Coleoptera, Elateridae) species to gramineous crops

Sonata KAZLAUSKAITĖ, Povilas MULERČIKAS, Vytautas TAMUTIS, Algimantas ŽIOGAS

Conference dinner 19.00

Wednesday – 11th June

Breakfast 8.00 – 9.30

SESSION 4

Chairman: Jarek Skłodowski

9.30 – 9.55

The comparison of longhorn beetles (Coleoptera: Cerambycidae) communities of selected nature reserves and not protected areas of the Silesian Voivodship

Lech KARPINŃSKI

9.55 – 10.20

The structure of the number of the longhorn beetles (Coleoptera: Cerambycidae) visitors flowering hawthorns in Europe

Marcin WALCZAK

10.20 – 10.45

Participation and importance of beetles (Insecta: Coleoptera) in the soil mesofauna communities of hornbeam-oak forests in Central Europe based on long-term observations – preliminary studies

Szymon KONWERSKI, Jerzy BŁOSZYK, Bartosz LABIAK, Filip SKWIERCZYŃSKI, Agnieszka NAPIERAŁA

10.45 – 11.10

The structure of ground beetle communities in mountain gravel-bed rivers depends on channel morphology

Tomasz SKALSKI, Bartłomiej WYŻGA, Renata KĘDZIOR, Mateusz PRZEBIĘDA, Joanna ZAWIEJSKA, Artur RADECKI-PAWLIK

Coffee break

SESSION 5

Chairman: Tomasz Skalski

11.30 – 11.55

Diversity of ground beetles assemblages (Coleoptera; Carabidae) on post-industrial areas of slag deposition.

Renata KĘDZIOR, Tomasz SKALSKI, Artur SZWALEC, Paweł MUNDAŁA

11.55 – 12.20

***Carabus nitens* as indicator for poor sandy soil conditions**

Rikjan VERMEULEN

12.20 – 12.45

Dispersal of carabid beetles between fragmented forests across wildlife corridors

Yuno DO

12.45 – 13.10

Changes in the body size of selected carabid species during 10 years of regeneration of an ecosystem disturbed by a hurricane in 2002 (Pisz Forest, Poland)

Jarosław SKŁODOWSKI

Lunch

SESSION 6: SPEED PRESENTATION

Chairman: Paweł Sienkiewicz

14.00 – 14.20

Changes in a weevil (Coleoptera: Curculionoidea) fauna in western Tatra Mountains, Poland

Maciej BONK

14.20 – 14.40

Diversity of saproxylic insects in clear-cut sites with removed and retained stumps

Inese KIVLENIECE

14.40 – 15.00

The diversity and abundance of beetles (Insecta: Coleoptera) in managed and unmanaged mature coniferous forests

Vytautas TAMUTIS

15.00 – 15.20

Species composition and abundance of wireworms (Coleoptera: Elateridae) in agrobiocenoses

Povilas MULERČIKAS

15.20 -16.00 Closing discussion

16.15 Excursion to the Smreczynski Pound in the Koscieliska Valley

20.00 Highlanders bonfire

Thursday 12th June

Breakfast 7.00 – 7.30

7.30 Excursion to the Carpathians' biological diversity hot spot Czerwone Wierchy (2000 m a.s.l.)

Abstracts

A review of the fauna of the long-horned beetles (Coleoptera: Cerambycidae) of Latvia

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The long-horned beetle family (Coleoptera: Cerambycidae) is one of the most investigated beetle families in Latvia. The first records of this family can be found from the second half of the 18th century. In total 122 long-horned beetle species are known in the Latvian fauna. However, almost every year new species of Cerambycidae are found in the local fauna. During the last 30 years, due to the intensification of the research studies, distribution of many long-horned beetle species in Latvia has been specified. The species which are commonly distributed to the south from Latvia, mainly in the Central Europe, were newly discovered in the local fauna of Latvia over the last few years. These species are, for example, *Agapanthia violacea* (FABRICIUS, 1775), *Phytoecia pustulata* (SCHRANK, 1776), *Grammoptera ustulata* (SCHALLER, 1783), *Axinopalpis gracilis* (KRYNICKI, 1832). Some xerothermic species in Latvia, for instance, *Phytoecia virgula* (CHARPENTIER, 1825), spread more intensively in the south-north direction. This expansion tendency is detected for a number of species and may indicate climate changes. According to SILFVERBERG'S (2010) classification 6 subfamilies of the long-horned beetle family: Prioninae (1 tribe, 3 genera, 3 species), Spondylidinae (1 tribe, 1 genera, 1 species), Aseminae (1 tribe, 4 genera, 6 species), Lepturinae (3 tribe, 17 genera, 44 species), Cerambycinae (7 tribe, 18 genera, 27 species) and Lamiinae (11 tribe, 18 genera, 41 species) were established in the Latvian fauna. Most species were found in Lepturinae (44 species) and Lamiinae (41 species) but less species were associated with Spondylinae, Prioninae and Aseminae subfamilies. Six Cerambycidae species are protected species in Latvia: *Anoplodera sexguttata* (FABRICIUS, 1775), *Ergates faber* (LINNAEUS, 1761), *Prionus coriarius* (LINNAEUS, 1758), *Tragosoma depsarius* (LINNAEUS, 1767), *Cerambyx cerdo* (LINNAEUS, 1758) and *Nothorina punctata* (FABRICIUS, 1798). One of these species, *Cerambyx cerdo* L., probably is extinct in Latvia.

Two similar weevil species: *Otiorhynchus rotundus* Marseul, 1872 and *O. smreczynskii* CMOLUCH, 1968

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The *Otiorhynchus*-complex is a group of phytophagous weevils, native and widespread in the Palaearctic region. 16 species of this genus was accidentally entered to the Nearctic region and now are widely distributed in the North America. Many species of *Otiorhynchus* are common pests of agriculture and forestry; some of them substantially damage ornamental plants. Appropriate species of the genus *Otiorhynchus* are considered as invasive and particular attention is paid to the specification of their biology, distribution and taxonomical status. *Otiorhynchus smreczynskii* CMOLUCH, 1968 is one of the species of this genus to which attention was mainly focused in recent years. *O. rotundus* MARSEUL, 1872 and *O. smreczynskii* appear very similar in their morphology and ecology; both species feed on the same plants. Despite their similarity, *O. smreczynskii* is getting more attention than *O. rotundus*. The aim of the research was to improve our knowledge about distribution, bionomy and determination of these weevil species. A total of 70 specimens were re-examined during this study. *Syringa vulgaris* leaves with edge-cuts were collected twice in a season in four localities. Collected leaves were herborized and leaf-edge-cuts were analysed. All specimens in the Daugavpils University Beetle Collection (DUBC), previously identified as *O. smreczynskii*, were re-examined. Weevils collected in Latvia were confirmed as *O. smreczynskii*, but 5 specimens from Lithuania were identified as *O. rotundus*. Several authors suggest that different weevil species make specific types of leaf-edge-cuts (ANDERSON 2009; FÄGERSTRÖM et al. 2010; BALALAIKINS & BUKEJS 2011) and that weevils can be identified by type of leaf-edge-cut they produce. ANDERSON (2009) and FÄGERSTRÖM et al. (2010) found differences between leaf-edge-cuts made by *Dodecastichus inflatus* (GYLLENHAL, 1834), and *O. smreczynskii* on the same host plants. In our study lilac leaf-edge-cuts induced by *O. smreczynskii* and *O. rotundus* were compared. Results show that leaf-edge-cuts vary in a damage rate and that their characteristics overlap to some extent. The damages made by *O. rotundus* usually are broader (cuts are 2–5 mm in width, less frequently about 1 mm, not very deep, often rounded, the space between cuts is relatively large) than that of *O. smreczynskii*. *O. smreczynskii* damages generally are narrower (cuts are about 1 - 3 mm in width, relatively deep and branched). The level of damage could be affected by different factors: the number of weevils feeding on a plant, the photoperiod (L:D) regime, the weather conditions (air temperature, wind speed and rainfall level) and structure of leaves. Acknowledgements of this research was carried out with support of the Latvia-Lithuania Cross Border Co-operation Programme 2007-2013. within the framework of the project "Joint resistance to bioinvasions for sustainable agriculture and management of natural resources" / "TEAMWORK" LLIV-250. References Anderson R. 2009. Vivlar på prydnadsväxter – nya arter eller förändringar i födopreferenser? First cycle, G2E. Alnarp: SLU, Plant Protection Biology. Available at <http://stud.epsilon.slu.se/831/> BALALAIKINS M., BUKEJS A. 2011. *Otiorhynchus smreczynskii* (Coleoptera: Curculionidae) – a weevil new to Estonia and Lithuania, with notes on its occurrence and bionomy in the Eastern Baltic region. Acta Zoologica Lithuanica 21 (4): 263 – 267. Fägerström C., KÄRNESTAM E. & ANDERSON R. 2010. New and expected weevils (Coleoptera: Otiorhynchini) on ornamental shrubs in Sweden. Entomologisk Tidskrift 131 (1): 37–48. [FÄGERSTRÖM, C., KÄRNESTAM, E., ANDERSON, R. 2010. Nya och förväntade öronvivelarter (Coleoptera: Otiorhynchini) på prydnadsbuskar i Sverige. Entomologisk Tidskrift 131 (1): 37–48.]

Changes in a weevil (Coleoptera: Curculionoidea) fauna in western Tatra Mountains, Poland

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Distribution of organisms on Earth depends on many different factors, and their changes imply a transformation of the richness, diversity and species ranges, and the structure of assemblages, as well as the functioning of the fauna and ecosystems. The nature of the Tatra Mountains is one of the most valuable in Europe, and its fauna is one of the richest and most valuable, both in terms of concentration of biological diversity, as well as fauna values. Due to the vertical gradient of vegetation and climate, and the mosaic of habitats, and associated adaptations of organisms, the diversity of life in the Tatra Mts. is extremely sensitive to changes, implicated by natural, as well as anthropogenic factors, like visible grazing and tourism in some places. In contrast to vertebrates and some invertebrates groups, there is no information on change within the herbivorous beetles like weevils in these mountains. The study on weevils was performed by sweeping for 13 localities representing the characteristic environment of the Polish Western Tatras in vertical gradient of altitude (approximately 900 m above sea level to about 1800 m a.s.l.) in years 1986 and 1987 as well as 2011 and 2012. Samples were collected in the season, the growing season from May to September each year. Preliminary results indicate that in the period between 1986-1987 and 2011-2012 there was a statistically significant decrease of weevil species in the area of the Tatra Mts (mean number of species per site in consecutive years were 16.8; SD=7.0, 19.0; SD=7.4, 13.3; SD=4.6, 9.7; SD=4.6). A GLM analysis showed a significant decrease in the number of species in locality depending on the year ($F = 3.85$, $P = 0.016$). In contrast, no significant correlation was found between species richness and habitat type interaction: the type of habitat * season, what indicates that the weevil assemblages of open and forest habitats are equally susceptible to change. On the other hand, post-hoc analysis (Bonferroni test) shows no significant differences between the seasons. This support hypothesis that a reduction in the number of species in a given locality is the result of long-term changes.

Carabid beetles (Coleoptera: Carabidae) as an indicator of habitat changes along roadsides after road renovation

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Carabids are good indicators of environmental conditions (habitat conditions). Therefore a trial to define habitat changes along roadsides on the by-road of the Skepe town (main road No. 10) on the base of carabid assemblages was carried out. It was assumed that the renovation of this road together with replacement of the groundwork (substratum) when the shoulders were slightly expanded, partly asphalted, caused an unification of carabid assemblages and an increase in the species similarity of these assemblages. The collection of carabid beetles using pitfall traps took place in 2008 before the road renovation and it was continued from 2010 to 2012 after the end of the reconstruction works. Six research plots were placed straightly on unpaved parts of the road shoulders and three traps were arranged in one row on every plot. To define habitat changes caused by the road renovation species similarity with application of the Jaccard index was calculated for roadside carabid assemblages. Comparison of the Jaccard's values calculated for the plots before and after the renovation indicated the respective changes.

The comparison of longhorn beetles (Coleoptera: Cerambycidae) communities of selected nature reserves and not protected areas of the Silesian Voivodship

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Preliminary results and particular methods of faunistic investigations on longhorn beetles (Coleoptera: Cerambycidae) communities of nature reserves and comparative areas of the Silesian Voivodship are presented. The aim of the study was to compare adequate pairs of areas by the characteristic, common microhabitats and to try to prove the importance of leaving dead wood in forests on the example of saproxylic species of this group of beetles. So far, the study was carried out during 2013 and 2014 in 14 areas. 7 woodland reserves and 7 adequate, not protected areas have been chosen. During the field studies commonly accepted standard methods of beetles collecting (such as: sighting of imagines, shaking down to japanese umbrella, sweep-netting) have been used, including specific and generic identification of abandoned and still active feeding sites. Rearing of material inhabited by the immature stages of the Cerambycidae was also conducted. To start the research in the nature reserves, the relevant authorizations from the Regional Directorate of Environmental Protection in Katowice were obtained. The total number of 51 species of Cerambycidae, belonging to 5 subfamilies was recorded as a result of field examination. Abundance and frequency of occurrence of Cerambycidae were determined. Among the representatives of 7 zoogeographical elements the palaeartic element (Pa) prevails, while the least represented is montane/submontane element (Gp). The research was conducted within the framework of the author's PhD thesis.

Harmfulness of the most abundant click beetle (Coleoptera, Elateridae) species to gramineous crops

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Every year, farmers suffer huge losses in relation to damage caused by click beetle larvae. They injure germinating seeds of the variety of plants, seedlings, underground parts of the plants, tubers, and roots. Damaged seeds do not sprout up, seedlings perish, and crops become sparse. The trade value gets worse and fungal or bacterial infection pervades through the injuries into potato tubers or vegetables during the storage period and finally the stored production gets rotten. There is a lack of data concerning click beetle bioecology and harmfulness under Lithuanian environmental conditions. Results of the research performed under laboratory conditions demonstrated that the harmfulness of the most common in agroecosystems click beetle species *Agriotes obscurus*, *Selatosomus aeneus*, *Cidnopus aeruginosus* larvae to maize, wheat and barley was different. It depended both on the plant ($F = 4.17^*$), click beetle species ($F = 3.22^*$) and on the number of larvae as well ($F = 11.41^{**}$). Results of the research under laboratory conditions showed that damage to maize caused by larvae of *Agriotes obscurus*, *Selatosomus aeneus*, *Cidnopus aeruginosus* was significantly greater. Significant differences among the numbers of click beetle larvae damaged wheat and barley have not been defined. *Agriotes obscurus* and *Selatosomus aeneus* larvae injured significantly highest number of the investigated plants. The quantity of damaged plants depended on the number of click beetle larvae. *Agriotes obscurus* and *Selatosomus aeneus* larvae were double more harmful in comparison to larvae of *Cidnopus aeruginosus*.

Diversity of ground beetles assemblages (Coleoptera; Carabidae) on post-industrial areas of slag deposition.

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Land rehabilitation of the postindustrial areas is the most important direct management practice allowing to return the given area to former state. In thermal electric power station industry, the waste deposition of slag requires large areas of sediments which should be re-cultivated to create functioning ecosystem. The aims of the project were to estimate the influence of environmental degradation and re-cultivation of postindustrial areas on species diversity and rate of colonization of ground beetle assemblages. Within a replicated controlled re-cultivation experiment, five transects of pitfall traps were established in re-cultivated tree zone and not re-cultivated open grasslands as well as reference sites of similar environmental demands outside the sediments. During the study, 2000 specimens belonging to 47 species of ground beetles were collected. Non-metric multidimensional scaling indicated high variation in species composition between assemblages of sediments and reference sites (total stress = 0.1, ANOSIM, $p < 0.01$). Generalized linear model showed significant reduction of total richness and species diversity of ground beetles on post-industrial areas in relation to reference sites. The re-cultivation process didn't influence positively on number of occurring species. Mean Individual Biomass and total biomass of ground beetle assemblages depended on re-cultivation process and habitat type. Our results showed that provided re-cultivation does not indicate the faster recreation of ground beetle assemblages as well as other soil organisms.

Diversity of saproxylic insects in clear-cut sites with removed and retained stumps

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Saproxylic (dead wood inhabiting) insects comprise a significant proportion of the biodiversity of most forest ecosystems (STENBACKA et al. 2010). They are vitally important in the initial fragmentation and breakdown of dead woody debris and comprise a food base for other organisms (WARRINER et al. 2004). A radical decline in the abundance of saproxylic insects and threatened species is a direct outcome of the large reduction of dead, decaying wood and old living trees in the forest landscape by modern forestry and agricultural practices (HJALTEN et al. 2007). To predict extinction risks and to evaluate the efficiency of conservation efforts, we need to understand the ecology of saproxylic species and to study the dynamics of the habitats and the inhabiting populations. Studies on stump harvesting effect on the growth of young forest stand in Latvia are lacking. Spruce, birch and aspen stands are more appropriate for stump removal, but pine stands are more protected by technical constraints and legislation of environmental protection. The main resources for forest fuels are stumps from private and national Latvian forests (LAZDĀNS et al. 2008). In this study we investigated differences in the saproxylic insect community in two clear-cut sites with removed and retained stumps during two years after felling. We expected lower numbers of endangered and common dead wood dwelling species in stumped area than in non-stumped sample site. Three types of traps were used in this study for quantitative and qualitative insect sampling and capture effectiveness of each sampling method was established. It was predicted that the use of pitfall traps and window traps will give more insect species than Malaise traps.

Opportunities for the conservation of deadwood inhabiting beetles in seminatural forests

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As forest management changes levels of resources and conditions, it is important to understand how ecosystem components respond to that. We analysed how saproxylics, which have adapted to different deadwood qualities and amounts determined by natural succession and disturbances in different forest types, correlate to deadwood quantities and qualities on a set of 128 stands varying from clear-cuts to old-growth forests on a gradient from nutrient-poor dry sites to nutrient-rich wet sites in Estonian hemiboreal forest. We caught 105 potentially representative species, 41% of them of conservation concern. As expected, old forests had more species and individuals than managed, cutting age forests. Clear-cuts hosted at least 3 times more individuals than closed canopy forests and also had more species, retention-cut being the richest. Species richness between site-types was very even, with the biggest number of unique species in fertile mixed forests. Shannon's diversity index did not differ between site types or management stages. The substrate models for 34 species indicated no non-linear relationships (possible thresholds) and most substrate associations were with a broad dead-wood category or common tree species. Just as important were other stand parameters, like forest naturalness, site-type, and sun exposure. We conclude that stand features like openness; site-type or management generated structural qualities (e.g. retention trees) play in our substrate-rich and well-connected forest landscape an equally important role as substrate availability. Also, that using thresholds for managing forest for saproxylic beetles is in such circumstances not very perspective.

**Revision of distribution and biology of *Agyrtes (Agyrtecanus) bicolor* LAPORTE, 1840
(Coleoptera: Agyrtidae) in Poland**

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Genus *Agyrtes* FRÖLICH, 1799 in the Palaearctic Region is represented by two subgenera with 6 species, three of which belong to subgenus *Agyrtecanus* REITTER, 1901. The only species from the subgenus which is broadly distributed in Europe and Asia, is *A. bicolor* LAPORTE, 1840. It is considered rare in the entire range of distribution and is included in the red lists of threatened species in many countries. Information on the biology, phenology and environmental preferences of *A. bicolor* are very scarce. In Poland it is known only from a few localities in the south of the country, based on old data. The authors present new data on distribution of *A. bicolor* in Poland with information on its phenology and biology.

From military range to Natura 2000 area - soldiers protecting beetle species diversity in western Poland

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One of the oldest military ranges in Poland - “Biedrusko” - is located north of Poznań. For over 100 years the area was not easily accessible and as a consequence the typical agricultural and industrial activities were minimized. This helped to protect some of the most interesting natural areas in close vicinity of Poznań. The area is characterized by a variety of environments, such as forests, meadows, grasslands, lakes, bogs, oxbow lakes, streams, etc. In 1995, after years of botanical and zoological research, Landscape Protected Area covering most of the military range, was established. In 2007, “Biedrusko” was included in the Natura 2000 network. High ecological value of this area is confirmed by beetle species (Insecta: Coleoptera) occurring there. The authors present list of beetle species from “Biedrusko”, that are protected by international and national law, included in red lists of threatened species and considered rare and endangered. Specific environmental requirements of the most interesting species and the importance of the area for beetle species diversity preservation are discussed.

Participation and importance of beetles (Insecta: Coleoptera) in the soil mesofauna communities of hornbeam-oak forests in Central Europe based on long-term observations – preliminary studies

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Quantitative and qualitative research was carried out in two nature reserves: “Jakubowo” and “Las Gąrdowy nad Mogilnicą” in west-central Poland in the years 1978-1983, 2005-2006 and 2013-2014. In both reserves three permanent sample plots were established in hornbeam-oak forests, differing in vegetation, soil structure, humidity, and shading. The quantitative samples were collected with a metal cylinder every two weeks (IV-VII) and once a month (XII-III). Soil invertebrates were extracted in Tullgren funnels and preserved in ethyl alcohol. The authors present preliminary results of studies on participation of Coleoptera in soil mesofauna communities and their importance as indicators of changes in hornbeam-oak forest ecosystems.

Areas on carbonate gyttia soils in the Olsztyn Lake District as specific habitats for ground beetles

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The investigations were carried out in the Olsztyn Lake District, in a moraine landscape shaped by the Pomeranian phase of the Vistula Glaciation. The sites chosen for analyses lie on the bottom of a former ribbon lake that used to connect Wulpińskie Lake with Giłwa Lake. This water body was drained out at the turn of the 19th and 20th century, as part of a large-scale hydroengineering project carried out in the whole region of the Masurian Lakes, where water from shallow water bodies was removed in order to enlarge the total acreage of grassland. As a result, the dried lake transformed into an area filled with calcareous gyttja. The hydrological characteristics of the examined sites expose them to effects produced by groundwater throughout most of the year and to flooding in autumn, winter and spring. These effects are manifested by the high soil moisture content, which in turn affects the air, water and thermal conditions. This distinguishes lacustrine rendzina from rendzina soils developed from solid limestone, which are warm, permeable and dry soils. The two types of soil create different conditions for the development of plants and consequently for the accumulation of organic matter or presence of insects associated with soil habitats. The lack of available information about the Carabidae dwelling in such habitats has encouraged us to undertake the present study, which aim was to determine the species composition and structure of communities of ground beetles on carbonate-rich swards.

Two areas were selected for the observations, and two sites were distinguished in both areas: one on an extensively used meadow, and the other one on some idle land being transformed to bog. In total, 1573 individuals of carabid beetles, representing 39 species were captured. Significant differences were observed between the examined sites in the number of captured individuals. However, no differences appeared between the sites in terms of the number of species. Nonetheless, the examined meadows and wasteland were considerably different in the species composition of captured specimens of ground beetles. The factors which most probably differentiated the species composition of carabid beetles on calcareous grasslands were: different land use, changeable moisture conditions and the surroundings of the habitats.

Species composition and abundance of wireworms (Coleoptera: Elateridae) in agrobiocenozes

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Click Beetles (Coleoptera: Elateridae) are important insect pests in Lithuania. Species composition and abundance of elaterid larvae in agrobiocenozes were examined. The research was carried out in four localities of Lithuania with different agrobiocenozes and soil types (Calc(ar)i- Hypostagnic Luvisols, Dystri- Haplic Arenosols, Eudocaleari- Epihypogleyic Cambisols, Eutri- Haplic Arenosols). During the research performed in 2009 - 2012 by means of the soil samples 1739 click beetle larvae were detected. The number of wireworms entered to the traps declined steadily depending on soil granulometric structure. It has been observed higher in lighter soils and lower towards heavier soil types. The least number of click-beetles has been trapped in the agrobiocenozes with the intensively cultivated land over the all study areas except sandy soils. This infers that intensive tillage may affect the abundance of click-beetles in agrobiocenozes. The summary of research data clearly indicates that the highest abundance of wireworms was discovered in the seminatural meadow with light granulometric structure soil. The most numerous species detected: *Selatosomus aeneus* L., *Agriotes lineatus* L., *Agriotes obscurus* L., *Cidnopus aeruginosus* OL., *Hemicrepidius niger* L.

**Bibliography and notes on distribution of *Rhaesus serricollis* (Motschulsky, 1838)
(Coleoptera: Cerambycidae: [Prioninae](#))**

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Rhaesus serricollis (MOTSCHULSKY, 1838) (Coleoptera: Cerambycidae: Prioninae) is classified as near threatened on the European Red List of Saproxylic Beetles. This species is recorded in the literature as distributed from Dalmatia, Albania, Serbia, Macedonia in the Balkan peninsula to southern Greece, Bulgaria, Turkey, Iran, Syria, Israel, Cyprus, Caucasus, Georgia, Transcaucasia and Near East. In Turkey, it occurs in Adana, Antalya, Bilecik, Burdur, Denizli, Düzce, Hatay, İçel, İstanbul, İzmir, Kahramanmaraş, Konya, Muğla, and Osmaniye provinces and the Toros Mountains. The aim of this study is to gather information on the distribution and biology of *Rhaesus serricollis* (Motsch.) in Mediterranean Region. We propose the complete information about known host plants (polyphagous on deciduous trees like *Platanus orientalis* (Platanaceae), *Ficus* (Moraceae), *Quercus ithaburensis*, *Q. calliprinos* (Fagaceae), *Populus* (Salicaceae), ecological and locality records of the species based on previous publications and new collections data. A comprehensive list of recent papers dealing with this species, together with a short review of Turkish *R. serricollis*, is also provided.

Distribution and spatial autocorrelation of carabid species in differently-treated post-agricultural areas

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The distribution of carabid beetles in a landscape composed of forests and differently treated post-agricultural open fields was studied over the four years period from 2004 to 2007 using a net of pitfall traps with a distance of 100 m between the traps in east-west direction and about 50 m in north-south direction. Five species, which were collected with more than 1000 individuals (*Calathus erratus*, *Calathus fuscipes*, *Harpalus rubripes*, *Harpalus tardus*, *Poecilus versicolor*), were selected for further research. Preliminary analyses of the data have shown that the species react sensitive on the different treatments of the ground. In the present paper I analyse in detail their spatial distribution patterns using Geary's C index of spatial autocorrelation in order to assess the degree of aggregation of the species in defined parts of the study area. As expected, *Calathus erratus* and *Poecilus versicolor* showed generally high spatial autocorrelations and *Harpalus tardus* low spatial autocorrelations. *Calathus fuscipes* showed also high spatial autocorrelations for the single years, but the value for the pooled data was slightly below the expectations, suggesting variation in spatial aggregation between the years. An unexpected high spatial autocorrelation was calculated for *Harpalus rubripes* when analysing the pooled data. However, this species showed high fluctuations in spatial autocorrelation between the sampling years, with a particular high value calculated for 2006. Since the highest number of individuals of *Harpalus rubripes* was recorded in this year, this result may have influenced the calculated spatial autocorrelation for the pooled data. The results lead to the conclusion that the connection of individual species to specific habitat types may be differently pronounced between different years. This might be interesting with respect to assess indicator values of species in the context of environmental monitoring.

The structure of ground beetle communities in mountain gravel-bed rivers depends on channel morphology

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Under natural conditions, river channels and floodplains are shaped by the variability of water discharge and sediment flux and are very dynamic ecosystems. At present, European river floodplains are among the most endangered landscapes due to human modifications to river systems, including channel regulation and floodplain urbanization, and land use changes in the catchments. Widespread channelization works and in-channel gravel mining have resulted in rapid channel narrowing and incision, simplifying habitats and decreasing biodiversity of the riverine and riparian ecosystems. This study aims to verify whether channel morphology significantly affects the structure and organization of ground beetle communities in mountain rivers. We investigated five rivers in the Polish Carpathians, that vary in a degree of channel modification and that flow through both unmanaged, multi-thread channel sections and sections with diverse channelization schemes (rapid hydraulic structures, concrete revetments or rip-rap of various age) or with incised channel. The results show that the areal extent and morphology of suitable habitat (gravel bars) and not solely its presence decide about the success of ground beetle communities in mountain rivers. At a microhabitat scale, the occurrence of ground beetles depends on the vertical zonation of riparian habitats and the highest density of beetles occurs in a 0.5-m wide transitional zone between the terrestrial and aquatic environments. When the zone is steepened due to channel incision, the diversity and abundance of the specialists of exposed riverine sediments is significantly reduced. Re-establishment of multi-thread channel itself has no or only a marginal effect on the composition and diversity of ground beetle communities. Much more significant is the widening of the active channel, which determines the heterogeneity of microhabitats and the availability of flow refugia. In narrow, channelized river sections, flow velocity increases rapidly with increasing discharge, which may be a limiting factor for the terrestrial invertebrates. In wider, unmanaged channel sections, the increase in flow velocity with increasing discharge is slower and the availability of exposed refugia associated with multi-thread river morphology enables the ground beetles to escape to the upper parts of gravel bars during floods.

Changes in the body size of selected carabid species during 10 years of regeneration of an ecosystem disturbed by a hurricane in 2002 (Pisz Forest, Poland)

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In 2002 a hurricane disturbed over 30,000 ha of pine stands in Pisz Forest (northeastern Poland). Most of the disturbed stands were removed and new plantations were established in their place. For research purposes, to monitor the spontaneous ecological succession, 445 ha of disturbed stands were left untouched. From 2003 to the present I have been monitoring the ecosystem regeneration on 15 plots, and within it the regeneration of carabid assemblages. In the first few years of the regenerative succession of the ecosystem, *Carabus arvensis* and *Carabus violaceus* had decreased body size in comparison to the control, while *Pterostichus niger* had increased body length. Analysis of the data from the last 10 years made it possible to identify a reaction of carabid assemblages progressing in three distinct phases. This reaction involves changes in the number of species, their catch rate, and assemblage structure (life traits). The following exploratory questions were formulated:

- Does the body size of particular carabid species change in the three successive phases of carabid regeneration?
- Does the body size of particular carabid species depend on the state of regeneration of the patch of the disturbed ecosystem they inhabit?

Longhorn beetles (Coleoptera: Cerambycidae) of selected Natura 2000 sites along the upper reaches of Oder river - preliminary results

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Longhorn beetles (Coleoptera: Cerambycidae) are one of the largest groups of wood borers which characterized as typical forest dependent insects. Thus they may be a potential bio-indicators for assessing forest conditions and their naturalness. Longhorn beetles family is represented in Poland by about 192 species. These group of insects are relatively well-known, however only a few regions in Poland have been investigated thoroughly. Natura 2000 is the youngest form of nature protection and inventories in these areas were conducted in general and were not focused on specific group of insects. The study area represents six selected Natura 2000 sites located along the Oder River: „Graniczny Meander Odry”, „Las koło Tworkowa”, „Łęg Zdzieszowicki”, „Żywocickie Łęgi”, „Grądy Odrzańskie” and „Grądy w Dolinie Odry”. Forest stands in these areas are represented mainly by riverine forests and oak-hornbeam forests. Researched areas are diverse in terms of size, location and habitats. The work presents preliminary results of author’s PhD thesis focused on longhorn beetles in these areas (SW Poland). The observations were done regularly during the last 2 years. Standard methods of longhorn beetles collecting like sighting of imagines, sweep-netting, shaking down to japanese umbrella and rearing in laboratory from collected pieces of infected food-plants are provided. The cerambycid fauna of the areas, according to collected data and literature information, contains 92 species including such – important from both faunistic and nature conservation perspective – as e.g. *Akimerus schaefferi*, *Saperda punctata*, *Axinopalpis gracilis*, *Cerambyx cerdo* or *Pedostrangalia revestita*.

The diversity and abundance of beetles (Insecta: Coleoptera) in managed and unmanaged mature coniferous forests

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The aim of this study was to disclose the structure of beetle (Coleoptera) communities and compare them in two forests with different status of management. The study was carried out in the coniferous forest (more than 95% consist of *Pinus sylvestris* and *Picea abies*) in the eastern part of Lithuania. One of the forests 65 % of which area was overgrown with trees aged more than 100 years was unmanaged since 1997; the other one was typically managed mature (80-100 years old) forest. The beetles were captured using barrier traps (b.t.) (trap area 0.25 m²) from May till September in 2013 (4 traps for each site). Litter samples (l. s.) (sample area 0.25 m² of litter surface) were taken in winter of 2014 (10 samples per each site). Altogether 1104 specimens (651 by b.t. and 453 in l. s.) from 224 species (169 and 70 respectively) and 40 families were captured. Eighteen species were captured using both methods. The most abundant families by species and (/) specimens numbers in barrier traps were following: Staphylinidae (45/117), Curculionidae (20/74), Elateridae (9/215), Cantharidae (9/34). In litter samples two families were the most numerous: Staphylinidae (35/331) and Carabidae (7/15). The species number as well as number of specimens in barrier traps were significantly higher in the managed forest (the average by 1 trap: 48 (±4.5) for species and 90,6 (±4,7) for individuals) comparing with the unmanaged one (37.4 (±2.9) and 70,4 (±7,8) respectively). The higher number of species and specimens captured by barrier traps in the managed forest apparently was caused by lower density of the woods. However, analysing litter samples no significant differences of these parameters were found. No significant differences were revealed comparing Shanon's indices of species diversity and Pielaou's indices of evenness in the two studied sites: in the managed forest - H' 3,48 (±0,19), E 0,89(±0,02) per b. t.; H' 1,98 (±0,12), E 0,9 (±0,02) per l. s.; in the unmanaged - H' 3,26 (±0,2), E 0,89(±0,03) per b. t.; H' 1,88 (±0,11), E 0,82 (±0,04) per l. s. Despite that both study sites were very unique by species composition. Even 54.3% found species were unique for managed woodland and 43.5% for unmanaged forests.

Themes and trends over 10 years of Baltic Coleopterology using the text mining methods

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We explored themes and trends covered by Baltic Journal of Coleopterology using the text corpora of 270 abstracts. Most articles (63.7% of total articles) were described the new taxa of Coleoptera while 34.1% were ecological studies associated with Coleoptera. Carabid community, distribution, and taxonomy were continuously contributed to the journal although relatively new topic such as landscape preference and modeling were significantly arisen from 2009.

Dispersal of carabid beetles between fragmented forests across wildlife corridors

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We identified wildlife corridors as linkages between two fragmented forests using carabid beetles. Three wildlife corridors were selected, which were constructed in 2007 to connect two forests fragmented by a 2-lane road in South Korea. We collected 982 individuals - 13 carabid species, from the wildlife corridors and connected forests. Carabid diversity in the forest sites was significantly higher than that in the wildlife corridor sites. Significant correlations between habitat preferences (forest, eurotopic, and open land species) and trap sites (forest or corridor sites) were noted for carabid richness and abundance. Significant correlation was noted between richness of species with flight capabilities and trap site, while carabid abundance for each flight capability showed no significant interaction with the trapping sites. Carabids from corridors were representative of the gradient from forest to corridors, with species richness showing the strongest gradient. However, the gradients were not continuous between the two fragmented forests across the corridors. Carabids aggregated in specific areas of the wildlife corridors. From canonical correlation analysis, ordination of trap sites was clearly divided into fragmented forest and wildlife corridor sites. Carabids that preferred the forest habitat were strongly associated with tree coverage. Correspondingly, carabids from open land and grassland showed correlations with grass and exposed land coverage. Thus, the wildlife corridors provide a heterogeneous habitat for forest carabids, as dry grassland or open land in forest. Additionally, some carabids that preferred the open habitats may be corridor dwellers that use the corridor as the habitat, because carabids are random walkers that require a small habitat range.

***Carabus nitens* as indicator for poor sandy soil conditions**

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Carabus nitens as an indicator for poor sandy soil conditions Rikjan Vermeulen , Alje Woldering and Kees van der Laaken Foundation Willem Beijerinck Biological Station, the Netherlands www.biological-station.com In the Netherlands, *Carabus nitens* (Coleoptera: Carabidae) is a characteristic species for large open heathlands. As result from reclamations, fragmentation and the excessive use of fertilizers *C. nitens* became almost extinct in the last half of the previous century. At the end of that century several measures were taken to restore the large heathlands in the province of Drenthe. For instance in one of the last remaining large heathlands, the Dwingelderveld, the poor soil conditions were brought back by sod-cutting and removal of those nutrient-rich sod. In another area, the Mantingerveld, the small heathland remnants, left in 1957 after the reclamation period and scattered throughout the area, were reunited by removing the nutrient-rich furrow, to a depth of 60-80 cm, of the arable fields in between. Doing so, the poor sandy character of the soil was restored. In the Dwingelderveld *C. nitens* was not caught anymore in the period 1970-1990, but it must have survived somewhere in low numbers at the 1670 ha of heathland, as it is restricted to heathlands and can not fly. 5-8 years after sod-cuttings were executed it was caught in high number (up to 250 individuals in one trap in one year) at those areas. At the Mantingerveld it did probably not survive. Last catches at the Hullenzand (25 ha in size), a remnant of heathland in the Mantingerveld area, were recorded from 1969. Top-soil removals were done in 1994 but up till 2007-2008 *C. nitens* was not captured, despite the good quality heathy character of this area. After 2008 an increasing number of catches were recorded with numbers of more than 300 in 2011 at the top-soil removal area. In 2003 75 specimens of *C. nitens* were released at the Hullenzand, at the border of the top-soil removal area. It is concluded that *C. nitens* profits from both soil impoverishing measures, sod-cutting and top-soil removal. Sod-cuttings should be executed every 20-25 years to maintain a high level of individuals. *C. nitens* might be a good indicator for nature managers to determine the moment of taking such measures to regain and maintain the poor sandy soil character of certain areas of nature.

The structure of the number of the longhorn beetles (Coleoptera: Cerambycidae) visitors flowering hawthorns in Europe

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The longhorn beetles (Cerambycidae) are a big family of the Coleoptera including about 30,000 described species with more than 600 species in Europe. Adults of most species visit flowers to feed from blossoms. One of their favourite plants is hawthorn (*Crataegus* ssp.) during the period of blossoming.

The longhorn beetles were collected in Poland (near Wrocław – Strachociński Forest), in the Sicily (near Cesaro) and in Greece – Peloponese (Agrios Petros and Vitina).

The main aims of the study include identifying the communities of longhorn beetles species which appear on blossoming hawthorns in different parts of Europe, identifying the species composition and their structure of domination.

Many rare species in Europe were discovered on the research areas, for instance: *Alosterna pauli* PESARINI, RAPUZZI & SABBADINI, 2004, *Calchaenesthes oblongomaculatus* (GUÉRIN, 1844), *Anaglyptus luteofasciatus* PIC, 1905 and *Anaglyptus gibbosus* (FABRICIUS, 1787).

**Results of using pheromone-baited traps for investigations of *Osmoderma barnabita*
MOTSCHULSKY, 1845 in Latvia**

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Osmoderma barnabita MOTSCHULSKY, 1845 is restricted to decaying heartwood and can be found only in large, old veteran trees of a variety of broad-leaved species in both relatively open old-growth woodland and traditional cultural landscapes. The hermit beetle is a strongly protected species in Latvia. *O. barnabita* is distributed scattered throughout the whole territory of Latvia. To carry out the field research pheromone-baited traps with pheromone (R)-(+)-gamma decalactone have been used. During investigations in total 246 individuals from 32 localities were sampled during the field seasons 2011 - 2013. For investigations was obtained a permit issued by the Latvian Nature Protection Board that allows for the collection of invertebrates during field research. The research has been carried out thanks to the European Union LIFE+ programme project “Management of Fennoscandian wooded meadows (6530*) and two priority beetle species: planning, public participation, innovation” (Identification Nr. LIFE09/NAT/LV/000240).