WILDLIFE RESEARCH

Contribution to the faunistic research of beetles (Insecta: Coleoptera) in Natural Monument Růžový kopec near Mikulov

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Abstract: The research of Natural Monument Růžový kopec took place at 2020. There were made six visits of the site during the vegetation season. During the survey, 183 species of beetles belonging to 26 families were found at the site, of which 5 species are protected pursuant to Section 56 Paragraphs 1 and 2 of Act No. 114/1992 Coll. and 38 species are included in the Red list of threatened species of the Czech Republic (Hejda et al. 2017). The most valuable species caught were *Agrilus roscidus* (Buprestidae), *Licinus cassideus* (Carabidae), *Zabrus spinipes* (Carabidae), *Liparus dirus* (Curculionidae), *Pseudocleonus cinereus* (Curculionidae), *Rhabdorrhynchus echii* (Curculionidae), *Cardiophorus vestigialis* (Elateridae), *Melanotus tenebrosus* (Elateridae) , *Coptocephala chalybaea* (Chrysomelidae), *Cheilotoma musciformis* (Chrysomelidae) and *Tituboea macropus* (Chrysomelidae).

KeyWords: beetles, faunistics, Coleoptera, entomology, Pálava

INTRODUCTION

Natural Monument Růžový kopec is situated in western part of Pálava Landscape Protected Area. It is a steppe lada with scattered shrubs, with preserved rocky outcrop in the top of the area and a combination of rock vegetation and vegetation of narrow-leaved and broad-leaved dry grasslands and high and low shrubs with the occurrence of specially protected thermophilic species of plants and animals typical of the ridge zone of Pavlovské vrchy. At the same time, it is a habitat of bird species and an example of a typical landscape element of the Pálava Landscape Protected Area. It is surrounded by vineyards and fields, somewhat drowned in the surrounding intensively used landscape. It thus represents an important refuge of steppe flora and fauna, which does not find suitable habitats on the surrounding land. The monument itself consists of the top part, terraces and steep slopes of Růžový kopec, the highest peak of which is less than 300 m above sea level (Mackovčin et al. 2007).

The research of Natural Monument Růžový kopec was carried out within the overall extensive survey of Pálava Landscape Protected Area (Rozkošný and Vaňhara 1995, 1996), although no comprehensive data are known from this locality. There was made management plan for the period 2013–2022, where list of protected species is present, including invertebrates (AOPK 2013).

MATERIAL AND METHODS

Material

The material was collected using various methods as sweep net, clap net, individual collecting from flowers, under bark and in dead wood, also under stones and from dung and cadavers. There were also placed pitfall traps at the site for collecting epigeic insect. The traps were installed during the first visit of the site and have been working throughout the research. The total number of traps was 15; they were placed in five series of three pieces and continuously emptied. Propylene glycol was used as a preservative liquid. The collected material was stored in vials with 70% ethanol and part of the material was mounted by gluing on the mounting boards and deposited in the private collection of the author. The material was identified with using relevant literature and identification keys (Hůrka 2017, Hůrka 1996, Mertlík 2011).

Table 1 The list of protected species and species contained in Redlist

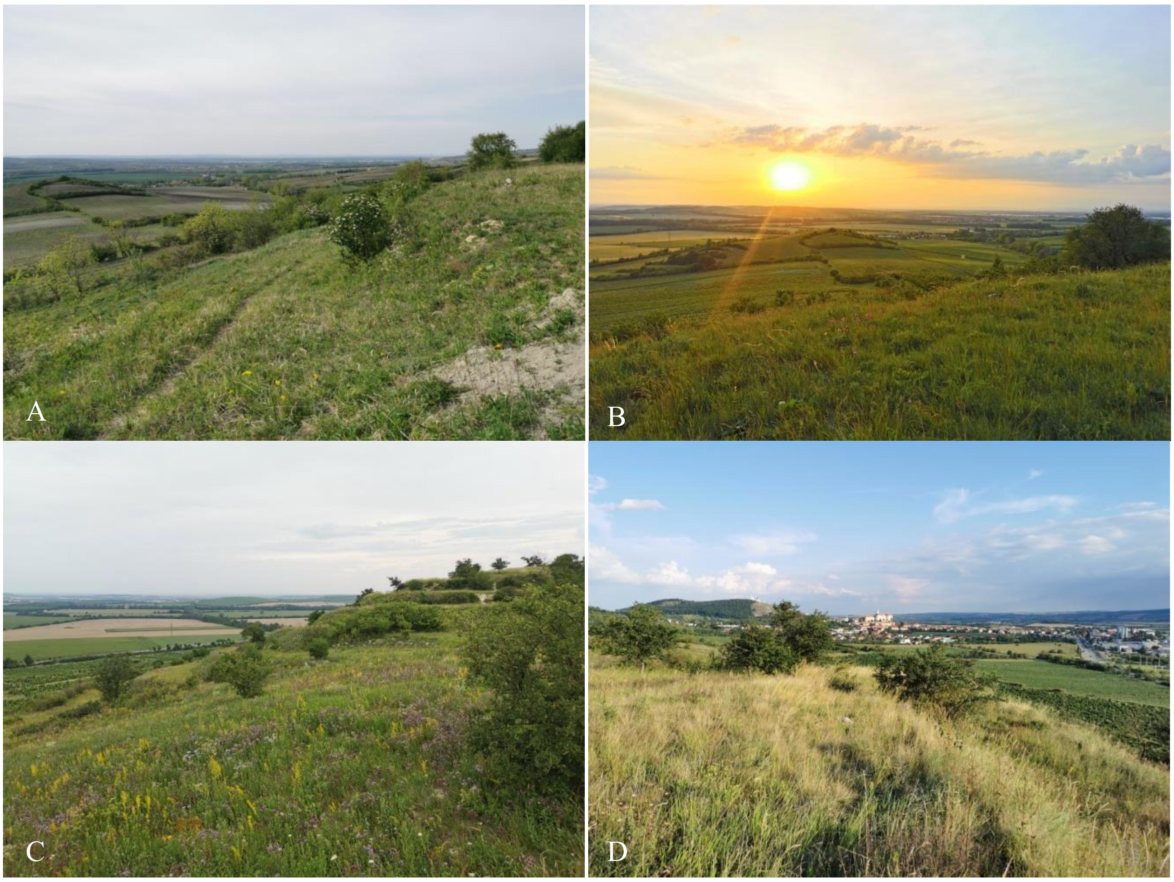
Family/Species	PS	Red list	Frequency
Buprestidae			
Agrilus hyperici (Creutzer, 1799)		**NT**	2
Agrilus roscidus (Kiesenwetter, 1857)		**EN**	2
Anthaxia fulgurans (Schrank, 1787)		**EN**	1
Anthaxia podolica Mannerheim, 1837		**VU**	3
Coraebus elatus (Fabricius, 1787)		**VU**	3
Cylindromorphus filum (Gyllenhal, 1817)		**VU**	2
Trachys fragariae (C. Brisout de Barneville, 1874)		**NT**	2
Carabidae			
Cicindela campestris (Linnaeus, 1758)	**III.O**		2
Cylindera germanica (Linnaeus, 1758)	**III.O**	**NT**	1
Licinus cassideus (Fabricius, 1792)		**EN**	2
Poecilus sericeus Fischer von Waldheim, 1824		**VU**	3
Zabrus spinipes (Fabricius, 1798)		**VU**	2
Curculionidae			
Cyphocleonus dealbatus (Gmelin, 1790)		**VU**	3
Foucartia ptochioides (Bach, 1856)		**VU**	1
Liparus coronatus (Goeze, 1777)		**NT**	2
Liparus dirus (Herbst, 1795)		**VU**	2
Pseudocleonus cinereus (Schrank, 1781)		**EN**	3
Rhabdorrhynchus echii (Brahm, 1790)		**EN**	3
Stomodes gyrosicollis (Boheman, 1843)		**NT**	2
Dermestidae			
Dermestes fuliginosus Rossi, 1792		**EN**	2
Elateridae			
Cardiophorus vestigialis Erichson, 1840		**EN**	1
Dicronychus rubripes (Germar, 1824)		**VU**	2
Melanotus tenebrosus (Erichson, 1841)		**CR**	3
Pheletes quercus (Olivier, 1790)		**NT**	2
Chrysomelidae			
Coptocephala chalybaea (Germar, 1824)		**CR**	3
Coptocephala rubicunda (Laicharting, 1781)		**VU**	2
Cryptocephalus pygmaeus vittula Suffrian, 1848		**EN**	1
Cheilotoma musciformis (Goeze, 1777)		**CR**	1
Pachybrachis fimbriolatus Suffrian, 1848		**VU**	2
Tituboea macropus (Illiger, 1800)		**CR**	3
Nitidulidae			
Urophorus rubripennis (Heer, 1841)		**VU**	1
Scarabaeidae			
Holochelus aequinoctialis (Herbst, 1790)		**NT**	3
Chaetopteroplia segetum (Herbst, 1783)		**NT**	2
Onthophagus semicornis (Panzer, 1798)		**NT**	1
Oxythyrea funesta (Poda, 1761)	**III.O**		1
Pleurophorus caesus (Creutzer in Panzer, 1796)		**NT**	3
Sisyphus schaefferi (Linnaeus, 1758)	**III.O**	**VU**	1
Tropinota hirta (Poda, 1761)	**II.SO**	**VU**	1
Tenebrionidae			
Omophlus proteus Kirsch, 1869		**VU**	1
Podonta nigrita (Fabricius, 1794)		**VU**	1

Legend: PS - protected species, categories I. KO, II. SO and III.O; Red list - categories according to IUCN (CR - critically endangered, EN - endangered, VU - vulnerable, NT - near threatened); frequency - 1(highest) - 3(lowest)

RESULTS AND DISCUSSION

During the research there were found 183 species of beetles belonging to 26 families at the site, of which 5 species are protected pursuant to Section 56 Paragraphs 1 and 2 of Act No. 114/1992 Coll. and 38 species are included in the Red List of Invertebrates of the Czech Republic (Hejda et al. 2017). There has been reported abundance in beetles, three categories has been established – 1 (highest), 2 (medium) and 3 (lowest). Within the research, there was recorded one species not present in the previous management plan (AOPK 2013), it is a species of *Cylindera germanica* (III.O) from Carabidae family. This species has recently spread throughout the country. Individuals of this species were found in pit fall traps in quite large numbers. Among the beetles captured at the site, there is a large number of steppe species that occur locally in southern Moravia. The locality is extremely rich in species of short-stemmed grasslands and xerothermic steppe species, occurring on loess substrates. The most numerous family was Chrysomelidae family, which included 33 found species. The family Curculionidae – weevils was rich in protected species, out of the total number of 18 recorded species, 7 species are included in the Red List of the Czech Republic. The spectrum of scarabaeid beetles is also interesting. Out of a total of 17 recorded species, 6 of them are included in the Red List of the Czech Republic and three species are included among the protected ones.

Figure 1 Photographies of the locality Růžový kopec (A in May, B in June, C in July and D in August)



Notes to most interesting species

Agrilus roscidus (Kiesenwetter, 1857) (EN) is widespread in warm areas of Europe, especially in the Mediterranean and sub-Mediterranean. South Moravia probably runs through the northern border of its distribution and the findings are rare (Škorpík et al. 2011). Found in the northern part of the site in several pieces sitting on *Prunus* spp branches.

Licinus cassideus (Fabricius, 1792) (EN) is a rare and declining species found at the best preserved steppe localities in central and northern Bohemia and in southern Moravia (Hůrka 1996). Several specimens were found at the site in pit fall traps.

Zabrus spinipes (Fabricius, 1798) (VU) is a large, black, flightless species of ground beetle, locally occurring in steppe unshaded habitats, vineyards and field edges. In the Czech Republic, it occurs locally in southern Moravia at a few localities (Hůrka 1996). There were several individuals found in pit fall traps at the site.

Liparus dirus (Herbst, 1795) (VU) adults occur since March in xerothermic habitats, mainly on steppes with short-stemmed grasslands. Adults occur nearby the trampled paths or penetrate the grass. The larvae develop on *Laserpitium latifolium*. It occurs rarely and locally in the Czech

Republic, especially in southern Moravia (Stejskal and Krátký 2007). There were found great numbers of individuals at the site, crawling through the grass or in pit fall traps.

Pseudocleonus cinereus (Schrank, 1781) (EN) is scattered and very locally occurring rare species in the Czech Republic, which inhabits xerothermic habitats such as steppes, pastures and road edges, especially in southern Moravia. Adults are active from March to June and from August to October. Mating usually takes place in May and June. It is oligophagus on *Asteraceae*, found on cornflowers (*Centaurea* spp.) and *Leontodon* spp. (Stejskal and Krátký 2007). There were several individuals found near the northern part of the site at the edge of the field.

Rhabdorrhynchus echii (Brahm, 1790) (EN) adults occur from late May to August with a maximum in June and July. They inhabit xerothermic open habitats with sandy, loess or limestone substrate with disturbed, free places and sparse vegetation. Quarries, sand pits and ruderals are also secondary habitats. In these habitats, it searches for early disturbed places with bare soil. It is oligophagous species feeding plants of family *Boraginaceae*. In the Czech Republic, the preferred food plant is *Echium vulgare*, the species is rarely found on *Cynoglossum* spp. Adults live hidden under leaf roses, but in sunny weather they sometimes climb on the leaves and flowers of food plants. The larvae feed in the roots and root necks and form a relatively large swell, there are also pupae. It is a rare species of the warmest areas in the Czech Republic. It has been spreading lately. It is endangered by succession and poor care for open sandy and steppe habitats. Appropriate management is the disturbance of these habitats by grazing, trampling, vehicle movement and removing bushes. There were found several individuals in pit fall traps at the site.

Cardiophorus vestigialis (Erichson, 1840) (EN) In the Czech Republic, it is a widespread species in loess steppe habitats, especially in southern Moravia. Larvae develop in the soil.

Melanotus tenebrosus (Erichson, 1841) (CR) is a sub-Mediterranean species of click beetle, adults occur in sunny open localities of forest-steppe character, often persisting on flowering trees and shrubs. This species is very local and rare in the Czech Republic, there is poor data known about its occurrence, the records are mainly from South Moravia (Laibner 2000). Several individuals sitting on hawthorn flowers (*Crataegus* spp.) were found at the site.

Coptocephala chalybaea (Germar, 1824) (CR) is a rare thermophilic species, occurring only locally in southern Moravia, adults are found since the end of May on herbs and shrubs in xerothermic habitats. Several individuals were caught using sweep net.

Cheilotoma musciformis (Goeze, 1777) (CR) is a rare species of preserved steppe habitats with the occurrence of its food plants, which in our country are mainly *Anthyllis vulneraria* and *Onobrychis viciifolia* (Warchałowski 1991). Adults were found in large numbers at the site.

Tituboea macropus (Illiger, 1800) (CR) is a very rare and locally occurring thermophilic species. The larvae develop on *Anthyllis vulneraria* (Warchałowski 1991). In the Czech Republic, it occurs only in the southernmost Moravia in the Pálava region, in xerothermic habitats of steppe character. There was found only one individual on vegetation at the site.

CONCLUSION

Růžový kopec locality is very valuable, it provides a refuge for many rare, local and endangered species of beetles, which in today's intensively managed cultural landscape we can find little where. It is therefore necessary to protect it from tree infestations and overgrowth with lush herbaceous vegetation. A suitable type of management would be partial grazing of vegetation by sheep.

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