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BEETLES (COLEOPTERA) OF SELECTED FAMILIES OF THE SLOPES OF MACOŠSKÁ AND VILÉMOVICKÁ STRÁŇ (MORAVSKÝ KRAS PROTECTED LANDSCAPE AREA, CZECH REPUBLIC)

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Abstract

NIEDOBOVÁ, J., HULA, V., ŠŤASTNÁ, P., BEZDĚK, J., FOIT, J., STEJSKAL, R.: *Beetles (Coleoptera) of selected families of the slopes of Macošská and Vilémovická stráň (Moravský kras Protected landscape area, Czech Republic).* Acta univ. agric. et silvic. Mendel. Brun., 2012, LX, No. 3, pp. 133–146

Two xerothermic localities in Moravský kras were investigated from March to November 2008. Altogether 183 species of beetles from 13 families (except Carabidae published separately) were collected in Macošská and Vilémovická stráň slopes using several collecting methods: pitfall traps, sweeping of vegetation and Möricke traps. Both slopes are located in the northern part of the Moravský kras and are influenced by pasture management. Altogether we found 21 species listed under Red list of threatened species in the Czech Republic, it is approximately 11.5% of all collected species. The most important species (two critically endangered – CR: *Eumolpus asclepiadeus* (Pallas, 1776), *Sphaeroderma rubidium* (Graëlls, 1853) and six endangered – EN) belong to family Chrysomelidae. Another endangered collected species belong to families Curculionidae and Staphylinidae.

Coleoptera, Moravský kras PLA, xerothermic habitats, faunistics

Moravský kras [Moravian karst] is one of the territories that are relatively poorly known from the perspective of beetle's faunistics. There are several partial works devoted to the southernmost part of the PLA (Hády, Lysá hora), but not many authors focused on the northern parts. Basically it can be said that there is only the work by Trávníček *et al.* (2008) dedicated to water beetles and the work by Hamet *et al.* (2009), focused on a wide range of insects and a greater number of sites (Vintoky, NR Mokřad pod Tipečkem, and the slope of Vykydalova stráň). In addition, there are some theses and dissertations devoted mainly to Carabidae (Horáková, 2001, 2005; Horáková *et al.*, 2005; Klašková, 2005, Kocmánková, 2005) however, no one studied other groups in this territory.

As for the territory, one of the most important habitats is xerothermic grasslands on limestone. In the PLA they are represented in its southern part (massif of Hády and valley of Říčka), then in the central part in Suchý žleb and in the north around Sloup and Šošůvka. In our work, we focus in particular on a part of Suchý žleb, the slopes of Macošská and Vilémovická stráň that have so far been rather neglected. Hamet *et al.* (2009) is engaged in the territory only superficially reporting up to 20 species of beetles from the territorry, and the only group comprehensively published from this location of the PLA is the work by Niedobová *et al.* (2011) dealing with Carabidae. In this study we present faunistic data for fourteen other families of beetles (Apionidae, Buprestidae, Cantharidae, Cerambycidae, Coccinellidae, Curculionidae, Dasytidae, Elateridae, Chrysomelidae, Malachiidae, Rhynchitidae, Scarabaeidae, Staphylinidae) from the slopes of Macošská and Vilémovická stráň.

MATERIALS AND METHODS

Localities

Investigated sites are located in the northern part of Moravský kras PLA on the west end of Suchý žleb valley. Collections were performed on a total of four transects of Macošská stráň and Vilémovická stráň slopes (see map – Fig. 1). Both localities are limestone hillsides with a well-developed limestone karren fields with habitats of secondary dry grasslands. The whole area was previously used as communal grazing (Kotouč, 2006). In 2006 there was regular grazing restored. Individual transects (T1–T4) are given by GPS coordinates (the quotes were taken over), and the entire site is located in the faunistic square 6666 (Pruner & Míka, 1996). Subsequently, conducted management and geographic exposure of the slope is reported.

- Macošská stráň T1, GPS 49°22'14"N, 16°44'13"E – south exposed slope on limestone, in 2008 unmanaged.
- Macošská stráň T2, GPS 49°22'13"N, 16°44'21"E – south exposed slope on limestone, in 2008 pastured (27. 8.–19. 9.).
- Vilémovická stráň T3, GPS 49°22'7"N, 16°44'32"E – north-west exposed slope on limestone, in 2008 pastured (25. 4.–15. 5. and 25. 9.–11. 10.).
- Vilémovická stráň T4, GPS 49°22'9"N, 16°44'38"E – west exposed slope on limestone, in 2008 pastured (4. 6.–2. 9.).

Investigation was conducted in 2008. We used three collecting methods: 1) pitfall traps – the main and standardized collecting method for beetles (Krásenský, 2005), 2) sweeping and 3) yellow Möricke cups which are not used for collecting of beetles usually. Two transects were marked out on every each slope (Macošská and Vilémovická stráň slope). In each of the four transects five pitfall traps were placed in line. We used plastic cups (capacity 500 ml). Traps were buried in lines always in the direction into the slope with about five-meter-long distances between them. As a fixative fluid we used 4% formaldehyde solution. All material from pitfall traps was marked and placed to a plastic bottle with 4% formaldehyde solution. Dates, locations and control of traps in 2008 were as follows: 22 April, 22 May, 18 June, 22 July, 18 August, 21 September, 21 October, and 28 November.

Sweeping by entomological sweeping net (diameter 35 cm) was done every 14 days (from 6th May to 2th September) in the direction into the slope, on each transect line we always made 200 sweeps. All of swept material was marked and placed to a plastic bottle with 70% alcohol solution. Material was than separated in laboratory.

Five yellow Möricke traps (cups) were placed in lines in five-meter distances. Each Möricke trap was produced from an eating box (15 x 15 cm). We sprayed big yellow patch (acrylate colour number 585005) to the middle of each box. The role of killing and fixation fluid was fulfilled by saline solution with adding a few drops of detergent. Yellow Möricke traps were installed at the locations for the first time on 22 April, 2008. Collections were performed in 14-day intervals and in hot summer months in 7-day intervals. All material from yellow Möricke traps were decanted, invertebrates were placed to a marked plastic bottle with 70% alcohol solution.

The Red list of threatened species in the Czech Republic – Invertebrates (Farkač *et al*., 2005) was used for evaluation of the status. Nomenclature, comments and relictness of Staphylinidae are based on Boháč (1999) and Boháč *et al*. (2006). He divided Staphylinid beetles to three groups. Group RI includes species of biotopes which are influenced by human activity the least (species with arcto-alpine, boreomontane and boreoalpine occurrence), group RII includes species of biotopes which are influenced by human activity in medium extent (natural and managed forests) and species of group E include species of deforestation biotopes which are strongly affected by man. Nomenclature, comments and relictness of Curculionoidea are based on Strejček (2000b) who divided Curculionoidea species into groups R, T, E. The same dividing is used in Benedikt *et al*. (2010). R species are relicts occuring on naturally relict localities only. T species are typical for specific biotopes and are able to adapt to alternate biotopes. E species are expansive, very adaptable species.

Nomenclature, comments and relictness of Chrysomelidae are based on Strejček (2000a) and Hamet *et al*. (2009). Relictness (R, T, E species) have the same characteristics like Curculionoidea. Nomenclature and comments of Elateridae are based on Laibner (2000). Nomenclature and comments of Coccinellidae are based on Audisio & Canepari (2011). All biological material is deposited in working places of experts who determined it.

RESULTS

We have found found 183 species from 13 families on two xerotermic habitats in Moravský kras PLA. Altogether we found 21 species (it is 11.5% from all captured beetles species) listed under Red list of threatened species in the Czech Republic – Invertebrates (Farkač *et al*., 2005). The most important species belong to family Chrysomelidae: two critically endangered species – CR: *Eumolpus asclepiadeus* (Pallas, 1776), *Sphaeroderma rubidum* (Graëlls, 1853) and six endangered species – EN: (*Dibolia cryptocephala* (Koch, 1803), *Galeruca pomonae* (Scopoli, 1763), *Longitarsus foudrasi* Weise, 1893, *Longitarsus helvolus* Kutschera, 1863, *Longitarsus minusculus* (Foudras, 1859) and *Psylliodes brisouti* Bedel, 1898). Another endangered species belong to families Curculionidae (*Psedocleonus grammicus* (Panzer, 1789)) and Staphylinidae (*Ontholestes haroldi* (Eppelsheim, 1884).

Altogether 19 collected species are relicts, 53 typical and 130 expansive species sensu particular

published lists. All collected species are recorded in the Tab. I with notes of localities, Red List Cathegory and Value of Bioindication. List of important species follows with some important publication about particular species.

Annotated List of Significant Species

(pt: pitfall traps, mt: yellow Möricke traps, s: sweeping).

Curculionidae

Lgt. Jana Niedobová, det. Jakub Beránek and Robert Stejskal apply for all material.

Cionus ganglbaueri Wingelmüller, 1914

Data: 1 ex., 10. 6. 2008, T1, s; 2 ex., 5. 8. 2008, T1, s; 1 ex., 2. 9. 2008, T1, s.

Oligophagous, developing on *Verbascum* spp. (with a preference for *Verbascum nigrum*) (Benedikt *et al.* 2010). In the Czech Republic known from Bohemia (Strejček, 1993), recently confirmed in Moravia from Znojmo env. (Stejskal, 2005b) and Bohemian-Moravian Highlands (Křivan & Stejskal, in prep.). Rare representative of the genus. According to the Red List of invertebrates (Benedikt & Strejček, 2005), it belongs to the near threatened (NT) category. The first published data from the Moravský kras PLA.

Graptus kaufmanni (Stierlin, 1884)

Data: 1 ex., 22. 4.–6. 5. 2008, T4, mt, 1 ex., 22. 4.–22. 5. 2008, T4, pt; 1 ex., 18. 6.–22. 7. 2008, T3, pt.

Flightless terricolous species, polyphagous on various herbs, more specific details on the development unknown. In our territory it is present only the south-east Moravia (Strejček, 1993). Actual occurence is known for example from the White Carpathians (Velká nad Veličkou, Stejskal, unpublished data). According to the Red List of invertebrates (Benedikt & Strejček, 2005), it belongs in the near threatened (NT) category. The first published data from the Moravský kras PLA.

Otiorhynchus ligustici (Linnaeus, 1758)

Data: 2 ex., 22. 4.–22. 5. 2008, T1, pt; 1 ex., 22. 4.–22. 5. 2008, T4, pt.

According to Strejček (1993) it is a relict species (R) found in the entire country. A common species of open agricultural landscape, especially at lower altitudes Polyphagous species, often considered a pest, which can cause considerable damage especially to hops and other crops (grapes, beets, Fabaceae, etc.) (Dieckman, 1980). Hamet *et al.* (2009) have already published it from the Moravský kras PLA.

Otiorhynchus orbicularis (Herbst, 1795)

Data: 6 ex., 22. 4.–22. 5. 2008, T4, pt; 1 ex., 22. 5.–18. 6. 2008, T3, pt; 2 ex., 22. 5.–18. 6. 2008, T4, pt; 1 ex., 18. 6.–22. 7. 2008, T2, pt; 1 ex., 2. 9. 2008, T1, s.

Rare representative of the family living in warm areas of farmland and grassy areas. Flightless terricolous species, polyphagous on various herbs. Strejček (1993) reported it from Bohemia as well as Moravia. According to the Red List of invertebrates (Benedikt & Strejček, 2005), it belongs in the near threatened (NT) category. Hamet *et al.* (2009) have already published it from the Moravský kras PLA.

Pseudocleonus grammicus (Panzer, 1789)

Data: 2 ex., 22. 4.–22. 5. 2008, T4, pt; 1 ex., 22. 7.–18. 8. 2008, T4, pt; 1 ex., 18. 8.–22. 9. 2008, T4, pt.

Flightless terricolous species, oligophagous on Compositae plants (Asteraceae), in the Czech Republic mainly on *Carlina* spp., *Centaurea* spp., *Inula* spp. The species will probably be more abundant than we think, but it lives secretly and is difficult to detect (it requires targeted hand collecting or pitfall traps). It feeds on currently mere fragments of naturally short grass, it is probably intolerable to advanced succession, which causes its current endangered status. Specific details are known from Moravia (Únanov, Mutěnice, Brno – Hády, Kurdějov, Velká nad Veličkou) (Stejskal, 2005a), more recently also from Ptáčov at Třebíč (Stejskal, unpublished data). From Bohemia there is only one known recent information from the natural monument of Toužínská stráň (Hesoun *et al.*, 2008). According to the Red List of invertebrates (Benedikt & Strejček, 2005), it belongs to the endangered (EN) category. The first published data from the Moravský kras PLA.

Trachyphloeus alternans Gyllenhal, 1834

Data: 1 ex., 22. 4.–6. 5. 2008, T1, mt.

Locally abundant species of grassy places and sparse forest edges, polyphagous, flightless terricolous species. According to the Red List of invertebrates (Benedikt & Strejček, 2005), it belongs to the near threatened (NT) category. Hamet *et al.* (2009) have already published it from the Moravský kras PLA.

Tychius lineatulus Stephens, 1831

Data: 1 ex., 18. 8. 2008, T3, s.

Rare species associated with the zigzag clover (*Trifolium medium*). Despite the relatively common occurrence of its host plant, this species is very local in whole country (Strejček, 1993). The species is not able to fly. The occurrence is known for example from Znojmo env. (Stejskal, unpublished data), NM Na Plachtě at Hradec Králové (Mikát & Hájek, 1999) and one finding from Frýdek Mistek (PP Kamenná) (Boža, 2007). According to the Red List of invertebrates (Benedikt & Strejček, 2005), it belongs to the near threatened (NT) category. The first published data from the Moravský kras PLA.

Tychius stephensi Schönherr, 1836

Data: 1 ex., 10. 6. 2008, T3, s; 1 ex., 22. 7. 2008, T3, s.

In the literature it is referred to abundant species (Dieckmann, 1988), according to Strejček (1993) it lives across the country. Only several records from different parts of the Czech Republic are known - Broumovsko PLA (Hamet & Vancl, 2005), south Bohemia, southern and eastern Moravia (Stejskal, unpublished data). Probably it is related to its determination difficulties. It is associated with red

clover (*Trifolium pratense*). Hamet *et al.* (2009) have already published it from the Moravský kras PLA.

Apionidae

Lgt. Jana Niedobová, det. Jakub Beránek and Robert Stejskal apply for all material.

Protapion gracilipes (Dietrich, 1857)

Data: 1 ex., 4. 6. 2008, T3, s; 5 ex., 23. 6. 2008, T3, s; 5 ex., 22. 7. 2008, T3, s; 2 ex., 5. 8. 2008, T3, s; 2 ex., 18. 8. 2008, T3, s; 2ex., 2. 9. 2008, T3, s.

Monophagous species feeding on *Trifolium medium* (Marotta & Osella, 2004). In our region it was detected in the 60s in southern Bohemia (Strejček, 1969) and in early 90s in southern Moravia (Strejček, 2000c). Špryňar *et al.* (2003) reported it from western and central Bohemia, Boža (2007) from Silesia. In southern Moravia it is common in the region of Znojmo (Stejskal, unpublished data), recently detected in the Českomoravská vrchovina Highland (Křivan & Stejskal, in prep.). The species is apparently undergoing significant expansion which has been also recorded in Poland (Petryszak & Biliński, 1978, Wanat, 2007). *Protapion gracilipes* is a typical species of margin communities of forests, meadows and grasslands, balks, shrubby slopes). Hamet *et al.* (2009) have already published it from the Moravský kras PLA.

Chrysomelidae

Lgt. Jana Niedobová, det. Jan Bezděk apply for all material.

Dibolia cryptocephala (Koch, 1803)

Data: 2 ex., 4. 6. 2008, T3, s; 1 ex., 10. 6.–18. 6. 2008, T3, pt; 1 ex., 23. 6. 2008, T3, s; 1 ex., 10. 7. 2008, T3, s; 1 ex., 5. 8. 2008, T3, s.

Oligophagous on *Thymus* spp., in uplands and foothill xerothermic areas from April to September (Čížek & Doguet, 2008). Wasowska (2006) also considers this species as characteristic for xerothermic grasslands. Januš (2004) and Strejček (2003) suggest that this species is associated with *Thymus pulegioides* at Křivoklát region and they add that it is a non-abundant species of xerothermic grasslands, sunny rocky steppes and pioneer communities of primitive soils. According to the Red List of invertebrates (Strejček & Bezděk, 2005), it is endangered species (EN).

Eumoplus asclepiadeus (Pallas, 1776)

Data: 4 ex., 23. 6. 2008, T1, s.

Limited by the occurrence of its host plant *Vincetoxicum hirundinaria* (Strejček, 2003). Locally abundant.

Longitarsus foudrasi Weise, 1893

Data: 4 ex., 23. 6. 2008, T1, s; 2 ex., 23. 6. 2008, T2, s; 5 ex., 3. 7.–10. 7. 2008, T1, mt; 4 ex., 10. 7. 2008, T1, s; 15 ex., 22. 7. 2008, T1, s; 3 ex., 22. 7.–29. 7. 2008, T1, mt; 1 ex., 22. 7.–18. 8. 2008, T1, pt; 46 ex., 5. 8. 2008, T1, s; 1 ex., 5. 8. 2008, T2, s; 14 ex., 18. 8. 2008, T1, s; 29 ex., 2. 9. 2008, T1, s; 2 ex., 2. 9.–8. 9. 2008, T1, mt.

Stenotopic oligophagous species feeding on *Verbascum* spp., in particular on *Verbascum lychnitis* (Čížek & Doguet, 2008). Januš (2004) describes it as rare xerothermic species living on rocky steppes and warm grasslands. According to the Red List of invertebrates (Strejček & Bezděk, 2005), this species is classified as endangered (EN).

Longitarsus helvolus Kutschera, 1863

Data: 1 ex., 22. 4.–22. 5. 2008, T2, pt; 2 ex., 22. 5.–4. 6. 2008, T1, mt; 1 ex., 4. 6. 2008, T1, s; 6 ex., 10. 6.–18. 6. 2008, T1, mt; 3 ex., 22. 7. 2008, T1, s; 12 ex., 5. 8. 2008, T1,s; 3 ex., 18. 8. 2008, T1, s; 2 ex., 2. 9.–8. 9. 2008, T1, mt; 9 ex., 2. 9. 2008, T1, s.

Stenotopic monophagous species feeding on *Teucrium chamaedrys* (Strejček, 2003, Čížek & Doguet, 2008). It has often been found at rocky steppes (Januš, 2004). This species was being confused with a similar *L. membranaceus* (Foudras, 1860) for almost a hundred years but Doguet (1993) rehabilitated it as a valid species. In southern Moravia it is quite abundant (Čížek & Doguet, 2008). According to the Red List of invertebrates (Strejček & Bezděk, 2005), it is an endangered species (EN).

Longitarsus minusculus (Foudras, 1859)

Data: 1 ex., 4. 6. 2008, T1, s; 2 ex., 10. 6. 2008, T1, s.

Rare species occurring only in original steppe habitats, especially in hilly xerothermic areas (Čížek & Doguet, 2008). Its feeding plant are *Stachys recta* (Strejček, 2003) and *Ballota nigra* (Čížek & Doguet, 2008). According to the Red List of invertebrates (Strejček & Bezděk, 2005), it is an endangered species (EN).

Psylliodes brisouti Bedel, 1898

Data: 1 ex., 2. 9.–8. 9. 2008, T1, mt; 2 ex., 21. 9.–21. 10. 2008, T2, pt; 1 ex., 21. 10.–28. 11. 2008, T2, pt.

Stenotopic oligophagous species feeding on *Erysimus* spp. It can be found at hilly xerothermic locations (Čížek & Doguet, 2008). Fornůsek & Čížek (2000) reported it from Moravia, the first finding for Bohemia was published by Januš (2004) in Křivoklát region, specifically on a south-exposed xerothermic hillside. According to the Red List of invertebrates (Strejček & Bezděk, 2005), this species is endangered (EN).

Sphaeroderma rubidum (Graells, 1858)

Data: 1 ex., 18. 8. 2008, T3, s.

Very rare species (Čížek & Doguet, 2008). Host plants are various Asteraceae species (*Carduus* spp., *Centaurea* spp., *Onopordum* spp.) (Strejček, 2003, Bukejs, 2009). Čížek & Doguet (2008) reported it from lowlands up to mountains with *Centaurea jacea* as main host plant. According to the Red List of invertebrates (Strejček & Bezděk, 2005), this species faces an extremely high risk of extinction, thus it is critically endangered (CR).

Staphylinidae

Lgt. Jana Niedobová, det. Pavel Krásenský apply for all material.

Ontholestes haroldi (Eppelsheim, 1884)
Data: 1 ex., 22. 5.–18. 6. 2008, T3, pt; 2 ex., 18. 8. 2008, T3, s.
This species lives in rotten organic substances. It has been collected in karst sinkholes of Moravský kras in 2002–2003 (Sedláčková *et al*., 2009). According to the Red List of invertebrates (Boháč *et al*., 2005), it is an endangered species (EN).

Elateridae

Lgt. Jana Niedobová, det. Jiří Foit apply for all material.

Ampedus glycereus (Herbst, 1784)
Data: 1 ex., 6. 5. 2008, T2, s; 1 ex., 10. 6. 2008, T4, s.
This species inhabits deciduous and mixed forests of lowlands and foothills. In the Czech Republic it occurs locally throughout the territory (Laibner, 2000). According to the Red List of invertebrates (Vávra, 2005), it is a near threatened species (NT).

Selatosomus gravidus (Germar, 1843)
Data: 1 ex., 18. 6.–22. 7. 2008, T4, pt.
The species occurs locally in the forest-steppe and steppe habitats throughout the Czech Republic (Laibner, 2000). According to the Red List of invertebrates (Vávra, 2005), it is a vulnerable species (VU).

Buprestidae

Lgt. Jana Niedobová, det. Jiří Foit apply for all material.

Agrilus hyperici (Creutzer, 1799)
Data: 1 ex., 22. 5.–18. 6. 2008, T4, pt; 1 ex., 22. 7. 2008, T1, s; 3 ex., 5. 8. 2008, T1, s; 2 ex., 5. 8. 2008, T3, s; 1 ex., 18. 8. 2008, T1, s.
Species expanded locally in warm regions throughout the Czech Republic, its development takes place in the roots of *Hypericum* spp. (Bílý, 1989). In southern Moravia it is a relatively abundant species. In the Red List of invertebrates (Škorpík, 2005), it belongs to the near threatened category (NT).

Coraebus elatus (Fabricius, 1787)
Data: 1 ex., 10. 6.–18. 6. 2008, T1, mt; 2 ex., 23. 6. 2008, T1, s; 1 ex., 3. 7.–10. 7. 2008, T2, mt; 1 ex., 22. 7.–29. 7. 2008, T1, mt.
Species expanded locally in warm regions throughout the Czech Republic, its development takes place in the roots of *Potentilla* spp. a *Sanguisorba* spp. (Bílý, 1989). In southern Moravia, its occurrence is known not only from the warmest areas (e.g. Znojmo region), but also from xerothermic habitats of the Czech-Moravian Highlands in the valleys of Brtnice, Jihlava and Oslava rivers (Křivan & Stejskal, 2009). According to the Red List of invertebrates (Škorpík, 2005), it is a near threatened species (NT).

Trachys fragariae C. Brisout de Barneville, 1874
Data: 30 ex., 22. 4.–6. 5. 2008, T2, mt; 19 ex., 22. 4.–6. 5. 2008, T4, mt; 7 ex., 22. 4.–22. 5. 2008, T1, pt; 14 ex., 22. 4.–22. 5. 2008, T2, pt; 3 ex., 6. 5. 2008, T1, s; 2 ex., 6. 5. 2008, T2, s; 2 ex., 22. 5.–4. 6. 2008, T2, mt; 3 ex., 22. 5.–4. 6. 2008, T3, mt; 4 ex., 22. 5.–18. 6. 2008, T1, pt; 2 ex., 22. 5.–18. 6. 2008, T2, pt; 1 ex., 22. 5.–18. 6. 2008, T3, pt; 2 ex., 18. 6.–22. 7. 2008, T2, pt; 1 ex., 18. 6.–22. 7. 2008, T3, pt; 1 ex., 18. 6.–22. 7. 2008, T4, pt; 6 ex., 22. 7.–18. 8. 2008, T1, pt; 3 ex., 22. 7.–18. 8. 2008, T2, pt; 1 ex., 22. 7.–29. 7. 2008, T1, mt; 1 ex., 18. 8.–21. 9. 2008, T4, pt; 1 ex., 21. 9.–21. 10. 2008, T1, pt.
In the Czech Republic, it is a local species of xerothermic habitats of lower and middle altitudes, its development takes place in the leaves of *Fragaria* spp. and *Potentilla* spp. (Bílý, 1989). In the Red List of invertebrates (Škorpík, 2005), it is included in the vulnerable category (VU).

Cerambycidae

Lgt. Jana Niedobová, det. Jiří Foit apply for all material.

Phytoecia cylindrica (Linnaeus, 1758)
Data: 1 ex., 10. 6. 2008, T3, s.
Local and rare species, abundant only at some places in southeastern Moravia, its development takes place in stems and roots of various Apiaceae (Sláma, 1998). It is not included in the Red List of invertebrates (Rejzek, 2005).

Tetrops starki Chevrolat, 1859
Data: 1 ex., 10. 6. 2008, T2, s.
Generally, it is a rare and local species inhabiting mixed and deciduous forests, where its development takes place in the terminal twigs of *Fraxinus* spp. or other deciduous trees (Sláma, 1998). It is not included in the Red List of invertebrates (Rejzek, 2005).

DISCUSSION

Some papers which contain faunistic data from Moravský kras PLA are weakly focused on beetles species of xerotermic localities. From existing studies (Hamet *et al*., 2009; Klašková, 2005; Šťastná & Bezděk, 2001 and Trávníček *et al*., 2008) we can find reference about beetles species of xerotermic habitats in Hamet *et al*. (2009) only. In comparison with their work, we can say, that beetles species on xerothermic localities of Macošská and Vilémovická stráň slopes differ significantly. Hamet *et al*. (2009) collected altogether 276 beetles species belong to 45 families in two xerotermic localities (except Carabid beetles), 7 species are listed under Red list of threatened species in the Czech Republic – Invertebrates (Farkač *et al*., 2005), it take 2.5% from all collected species only. We found 183 beetles species in 13 families, but 21 species (11.5% from all collected species) are listed under Red list of threatened species in the Czech Republic – Invertebrates. The only one species, *Coraebus elatus* (Fabricius, 1787) was recorded in both works. The other studies were conducted on open habitats, but not xerothermic (Šťastná & Bezděk, 2001; Klašková, 2005). Šťastná & Bezděk (2001) found 7 species (2.4% from all collected species, exept

Carabid beetles) listed under Red list of threatened species in the Czech Republic – Invertebrates and Klašková (2005) collected 196 species of Staphylinid beetles, 9 species listed by Farkač *et al.* (2005). Both papers mentioned above have smaller number of threatened species in average. There are more reasons for this difference, not only the habitat type, even collecting method used for our investigation.

I: *Summary of species detected*

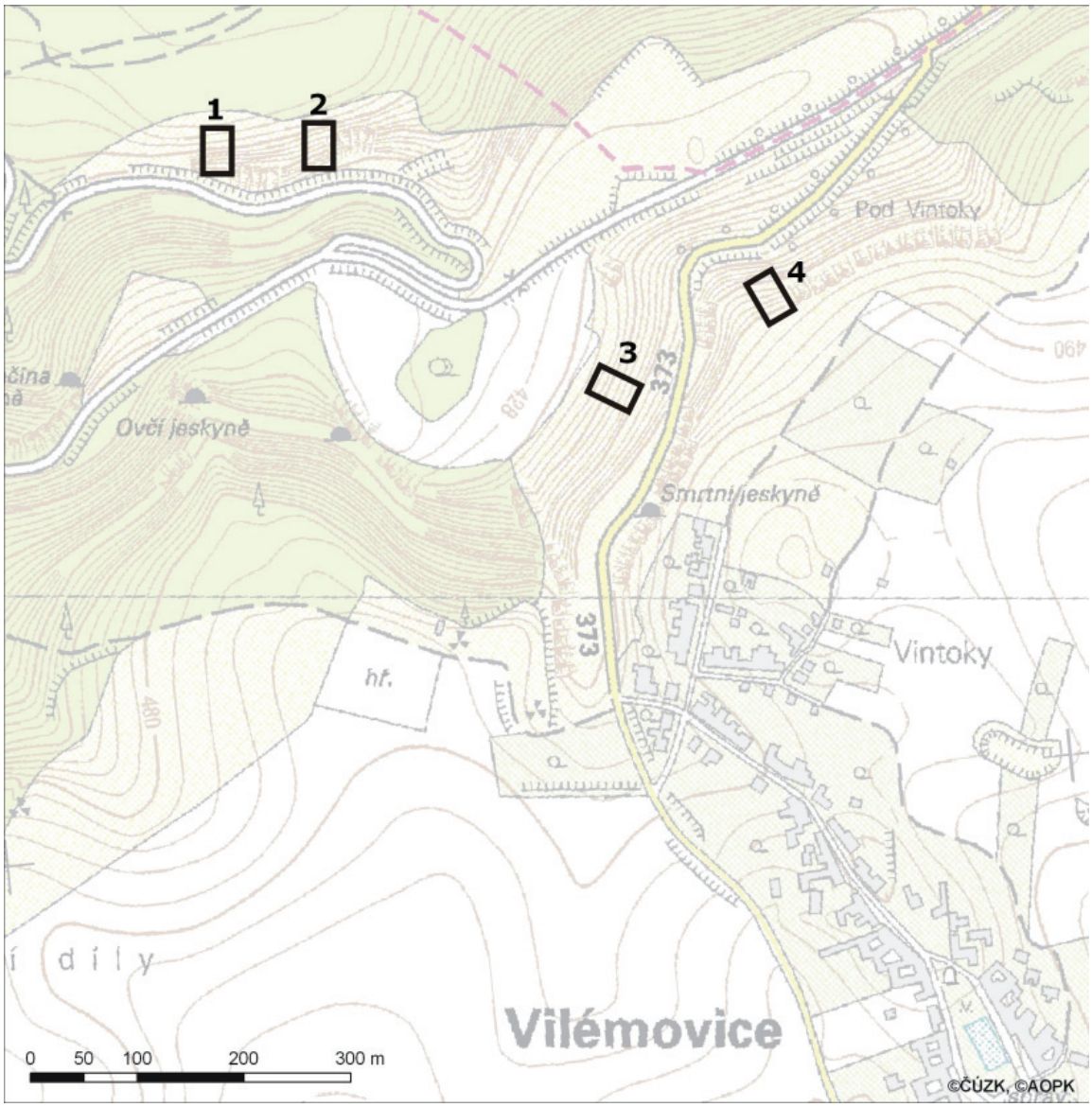
Families and species	T1 + T2	T3 + T4	Red List cathegory	Value of bioindication
Apionidae				
Apion cruentatum Walton, 1844		1		T
Catapion seniculus (W. Kirby, 1808)	1	1		E
Ceratapion onopordi (W. Kirby, 1808)	1	5		E
Hemitrichapion pavidum (Germar, 1817)	17	9		E
Ischnopterapion loti (W. Kirby, 1808)		2		E
Oxystoma cerdo (Gerstaecker, 1854)		1		E
Protapion apricans (Herbst, 1797)		5		E
Protapion assimile (W. Kirby, 1808)		1		E
Protapion gracilipes (Dietrich, 1857)		17		R
Protapion trifolii (Linnaeus, 1768)	4	6		E
Pseudoperapion brevirostre (Herbst, 1797)	6	5		E
Pseudostenapion simum (Germar, 1817)		4		E
Stenopterapion tenue (W. Kirby, 1808)		1		E
Synapion ebeninum (W. Kirby, 1808)		2		T
Buprestidae				
Agrilus hyperici (Creutzer, 1799)	5	3	NT	
Anthaxia nitidula (Linnaeus, 1758)		1		
Coraebus elatus (Fabricius, 1787)	5		NT	
Trachys fragariae C. Brisout de Barneville, 1874	77	26	VU	
Cantharidae				
Cantharis fusca Linnaeus, 1758	1	1		
Metacantharis haemorrhoidalis (Fabricius, 1792)	8			
Rhagonycha fulva (Scopoli, 1763)		4		
Rhagonycha interposita Dahlgren, 1978		1		
Rhagonycha lignosa (O. F. Müller, 1764)	1			
Rhagonycha lutea (O. F. Müller, 1764)		15		
Cerambycidae				
Phytoecia coerulescens (Scopoli, 1763)	1			
Phytoecia cylindrica (Linnaeus, 1758)		1		
Stenurella bifasciata (O.F. Müller, 1776)	8			
Stenurella melanura (Linnaeus, 1758)	7	1		
Tetrops starki Chevrolat, 1859	1			
Coccinellidae				
Coccinella quatuordecimpustulata (Linnaeus, 1758)	31	46		
Coccinella quinquepunctata Linnaeus, 1758	5	2		
Coccinella septempunctata Linnaeus, 1758	8	6		
Hippodamia variegata (Goeze, 1777)		2		
Hyperaspis reppensis (Herbst, 1783)	4			
Tytthaspis sedecimpunctata (Linnaeus, 1758)	2	3		
Curculionidae				
Anthonomus rubi (Herbst, 1795)	3	2		E
Barynotus obscurus (Fabricius, 1775)		2		T
Brachysomus echinatus (Bonsdorff, 1785)		4		T

Families and species	T1 + T2	T3 + T4	Red List cathegory	Value of bioindication
Ceutorhynchus obstrictus (Marsham, 1802)	4	2		E
Ceutorhynchus typhae (Herbst, 1795)	1	2		E
Cionus ganglbaueri Wingelmüller, 1914	4		NT	R
Cionus thapsus (Fabricius, 1792)	82			E
Eusomus ovulum Germar, 1824	45	10		E
Graptus kaufmanni (Stierlin, 1884)		3	NT	R
Hypera miles (Paykull, 1792)		1		E
Hypera nigrirostris (Fabricius, 1775)		3		E
Hypera plantaginis (De Geer, 1775)	1	1		T
Larinus pollinis (Laicharting, 1781)		1		T
Otiorhynchus cornicinus Stierlin, 1861	1	7		E
Otiorhynchus ligustici (Linnaeus, 1758)	2	1		E
Otiorhynchus orbicularis (Herbst, 1795)	2	9	NT	R
Otiorhynchus ovatus (Linnaeus, 1758)	1	6		E
Otiorhynchus raucus (Fabricius, 1777)	2	1		E
Otiorhynchus singularis (Linnaeus, 1767)		4		E
Otiorhynchus sulcatus (Fabricius, 1775)		1		E
Parafoucartia squamulata (Herbst, 1795)	6			T
Phyllobius maculicornis Germar, 1824	1	3		T
Phyllobius oblongus (Linnaeus, 1758)		2		E
Phyllobius pyri (Linnaeus, 1758)		1		E
Phyllobius vespertinus (Fabricius, 1792)	1			E
Polydrusus impar Des Gozis, 1882	1			T
Pseudocleonus grammicus (Panzer, 1789)		4	EN	R
Sciaphilus asperatus (Bonsdorff, 1785)	1	6		E
Sitona hispidulus (Fabricius, 1776)		3		E
Sitona humeralis Stephens, 1831	3	2		E
Sitona languidus Gyllenhal, 1834	18	6		E
Sitona lineatus (Linnaeus, 1758)	20	19		E
Sitona macularius (Marsham, 1802)		1		E
Sitona puncticollis Stephens, 1831	6	6		E
Sitona striatellus Gyllenhal, 1834	1			T
Sitona sulcifrons (Thunberg, 1798)	5	26		E
Stenocarus ruficornis (Stephens, 1831)	2	2		E
Trachyphloeus alternans Gyllenhal, 1834	1		NT	R
Trachyphloeus bifoveolatus (Beck, 1817)	1			T
Trichosirocalus troglodytes (Fabricius, 1787)	3			E
Tychius lineatulus Stephens, 1831		1	NT	R
Tychius picirostris (Fabricius, 1787)	18	5		E
Tychius stephensi Schönherr, 1836		2		R
Dasytidae				
Danacea nigritarsis (Küster, 1850)	11			
Elateridae				
Agriotes obscurus (Linnaeus, 1758)		27		
Agriotes sputator (Linnaeus, 1758)	52	18		
Agriotes ustulatus (Schaller, 1783)	1			
Agrypnus murinus (Linnaeus, 1758)	8	9		
Ampedus glycereus (Herbst, 1784)	1	1	NT	
Athous bicolor (Goeze, 1777)	2			

Families and species	T1 + T2	T3 + T4	Red List cathegory	Value of bioindication
Cidnopus pilosus (Leske, 1785)	2			
Dalopius marginatus (Linnaeus, 1758)	2	1		
Idolus picipennis (Bach, 1852)		1		
Limonius minutus (Linnaeus, 1758)	11	1		
Melanotus brunnipes (Germar, 1824)	3			
Prosternon tessellatum (Linnaeus, 1758)	7	4		
Selatosomus aeneus (Linnaeus, 1758)	2	3		
Selatosomus gravidus (Germar, 1843)		1	VU	
Chrysomelidae				
Aphthona euphorbiae (Schrank, 1781)	23	268		E
Aphthona pygmaea Kutschera, 1861		2		T
Aphthona venustula Kutschera, 1861		30		E
Bruchidius marginalis (Fabricius 1775)	1			T
Bruchus atomarius (Linnaeus 1761)	1			E
Cassida sanguinolenta Müller, 1776	1			E
Clytra laeviuscula Ratzeburg, 1837	3	2		E
Clytra quadripunctata (Linnaeus, 1758)	1			T
Coptocephala rubicunda (Laicharting, 1781)	6	3		R
Cryptocephalus bameuli Duhaldeborde, 1999	7			E, T
Cryptocephalus bipunctatus (Linnaeus, 1758)	4	5		T
Cryptocephalus flavipes Fabricius, 1781	7			T
Cryptocephalus moraei (Linnaeus, 1758)	11	16		E
Cryptocephalus sericeus (Linnaeus, 1758)	5			T
Derocrepis rufipes (Linnaeus, 1758)	4	49		E
Dibolia cryptocephala (Koch, 1803)		6	EN	R
Eumolpus asclepiadeus (Pallas, 1776)	4		CR	R
Galeruca pomonae (Scopoli, 1763)		2	EN	R
Galeruca tanaceti (Linnaeus, 1758)	1	5		T
Hispa atra Linnaeus, 1767	3			E
Hypocassida subferruginea (Schrank, 1776)	40			T
Chaetocnema aridula (Gyllenhal, 1827)	4	8		T
Chaetocnema concinna (Marsham, 1802)	1	2		E
Chaetocnema hortensis (Fourcroy, 1785)	40	86		E
Chaetocnema picipes Stephens 1831	4	32		E/T
Chrysolina cuprina (Duftschmid, 1825)	1	2		T
Chrysolina sanguinolenta (Linnaeus, 1758)		1		R
Chrysolina varians (Schaller, 1783)		2		E
Labidostomis longimana (Linnaeus, 1761)	7	12		T
Longitarsus exsoletus (Linnaeus, 1758)	3			E
Longitarsus foudrasi Weise, 1893	126		EN	R
Longitarsus helvolus Kutschera, 1863	39		EN	R
Longitarsus luridus (ScopoIi, 1763)	1	3		E
Longitarsus minusculus (Foudras, 1859)	3		EN	R
Longitarsus nigrofasciatus (Goeze, 1777)	33			E
Longitarsus parvulus (Paykull, 1799)		12		E
Longitarsus salviae Gruev, 1975	1			E
Longitarsus succineus (Foudras, 1859)	1			E
Luperus luperus (Sulzer, 1776)		5		E
Oulema gallaeciana (Heyden, 1870)	4	4		E

Families and species	T1 + T2	T3 + T4	Red List cathegory	Value of bioindication
Phyllotreta atra (Fabricius, 1775)		2		E
Phyllotreta cruciferae (Goeze, 1777)	2	4		E
Phyllotreta nigripes (Fabricius, 1775)	18	6		E
Phyllotreta undulata Kutschera, 1860		1		E
Phyllotreta vittula (Redtenbacher, 1849)	24	46		E
Psylliodes brisouti Bedel, 1898	4		EN	R
Sermylassa halensis (Linnaeus, 1767)		2		E
Smaragdina affinis (Illiger, 1794)	1	1		T
Smaragdina salicina (Scopoli, 1763)		3		T
Spermophagus calystegiae (Lukyanovich & Ter-Minasyan, 1957)	2			E
Spermophagus sericeus (Fourcroy, 1785)	1			E
Sphaeroderma rubidum (Graëlls, 1853)		1	CR	R
Malachiidae				
Axinotarsus marginalis (Laporte, 1840)	2			
Clanoptilus elegans (Olivier, 1790)	1	1		
Clanoptilus viridis (Fabricius, 1787)	48	56		
Charopus concolor (Fabricius, 1801)	1	15		
Charopus graminicola (Dejean, 1833)	1	2		
Malachius bipustulatus (Linnaeus, 1758)		1		
Rhynchitidae				
Tatianaerhynchites aequatus (Linnaeus, 1767)	1	1		E
Scarabaeidae				
Onthophagus ovatus (Linnaeus 1767)	1	1		
Onthophagus semicornis (Panzer 1798)		1	NT	
Serica brunnea (Linnaeus 1758)	1			
Staphylinidae				
Acidota cruentata (Mannerheim, 1831)	3			RII
Aleochara bilineata Gyllenhal, 1810		1		E
Aleochara cf. *curtula* (Goeze, 1777)		5		E
Aleochara curtula (Goeze, 1777)	1	5		E
Atheta cf. *crassicornis* (Fabricius, 1792)		1		E
Dinothenarus fossor (Scopoli, 1772)	5	14		RII
Drusilla canaliculata (Fabricius, 1787)	40	40		E
Eusphalerum cf. *semicoleoptratum* (Panzer, 1794)	1			E
Gabrius osseticus (Kolenati, 1846)		1		E
Lathrobium pallidum Nordmann, 1837		1		RII
Ocypus cf. *tenebricosus* (Gravenhorst, 1846)		14		RII
Ocypus fulvipennis Erichson, 1840	3	3		RII
Ocypus fuscatus (Gravenhorst, 1802)		7		E
Ocypus macrocephalus (Gravenhorst, 1802)	1			RII
Ocypus nitens (Schrank, 1781)		8		E
Omalium caesum Gravenhorst, 1806	2	1		E
Ontholestes haroldi (Eppelsheim, 1884)		3	EN	RI
Oxypoda vittata Märkel, 1842	1			A
Paederus litoralis Gravenhorst, 1802	1	2		E
Philonthus carbonarius (Gravenhorst, 1802)		2		E
Philonthus varians (Paykull, 1789)	2			E
Plataraea dubiosa (G. Benick, 1935)		1		RII

Families and species	T1 + T2	T3 + T4	Red List cathegory	Value of bioindication
Platydracus fulvipes (Scopoli, 1763)		3		RII
Platydracus stercorarius (Olivier, 1795)	11	10		RII
Stenus ochropus Kiesenwetter, 1858	1	2		RII
Tachinus laticollis Gravenhorst, 1802		1		E
Tachyporus hypnorum (Fabricius, 1775)	18	10		E
Tachyporus chrysomelinus (Linnaeus, 1758)	2	2		E
Xantholinus cf. *linearis* (Olivier, 1794)		1		E



1: *Map of Macošská and Vilémovická stráň slope with marked transects. Number 1 and 2 are transect on Macošská stráň slope, number 3 and 4 are transect on Vilémoviská stráň slope*

SUMMARY

The aim of this study was to find out beetles species living in the xerothermic grasslands in the northern part of Moravský kras PLA. Exept faunistics, this work focuses on importance of each species from two evaluative points of view: Red List of Invertebrates of the Czech Republic and bioindication

value. Our team worked on two xerothermic localities named Macošská and Vilémovická stráň slopes from March to November 2008. These slopes are especial because of their well-developed limestone karren fields. We used three collecting methods: pitfall traps, sweeping of vegetation and Möricke traps. Altogether 183 species of beetles from 13 families (except Carabidae published separately) were collected. The most important and interesting species are commented.

Altogether 21 found species are included in Red List of Invertebrates of the Czech Republic. The only two critically endangered species (CR) were found: *Eumolpus asclepiadeus* (Pallas, 1776) and *Sphaeroderma rubidum* (Graëlls, 1853) from the family Chrysomelidae. From the same family we collected six endangered species (EN) too: *Dibolia cryptocephala* (Koch, 1803), *Galeruca pomonae* (Scopoli, 1763), *Longitarsus foudrasi* Weise, 1893, *Longitarsus helvolus* Kutschera, 1863, *Longitarsus minusculus* (Foudras, 1859) and *Psylliodes brisouti* Bedel, 1898. Family Curculionidae is represented by one endangered species: *Pseudocleonus grammicus* (Panzer, 1789). From the family Staphylinidae was found endangered *Ontholestes haroldi* (Eppelsheim, 1884). We collected also 9 species in near threatened (NT) cathegory: *Agrilus hyperici* (Creutzer, 1799) and *Coraebus elatus* (Fabricius, 1787) from the family Buprestidae, *Cionus ganglbaueri* Wingelmüller, 1914, *Graptus kaufmanni* (Stierlin, 1884), *Otiorhynchus orbicularis* (Herbst, 1795), *Trachyphloeus alternans* Gyllenhal, 1834 and *Tychius lineatulus* Stephens, 1831 from the family Curculionidae, *Ampedus glycerus* (Herbst, 1784) from the family Elateridae and *Onthophagus semicornis* (Panzer 1798) from the family Scarabaeidae. Cathegory of vulnerable species (VU) is represented by *Trachys fragariae* C. Brisout de Barneville, 1874 from the family Buprestidae and *Selatosomus gravidus* (Germal, 1843) from the family Elateridae.

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REFERENCES

AUDISIO, P., CANEPARI, C. (eds.), 2011: Fauna Europaea – Coccinelidae. Available online at http://www.faunaeur.org/ (cited: 20. 6. 2011).

BENEDIKT, S., STREJČEK, J., 2005: Curculionoidea (nosatci), pp. 545–555. In: FARKAČ, J., KRÁL, D., ŠKORPÍK, M. (eds): *Červený seznam ohrožených druhů České republiky*. AOPK ČR, Praha, 760 pp.

BENEDIKT, S., BOROVEC R., FRUMUTH, J., KRÁTKÝ, J., SCHÖN, K., SKUHROVEC, J., TRÝZNA, M., 2010: Komentovaný seznam nosatcovitých brouků (Coleoptera: Curculionoidea bez Scolytinae a Platypodinae) České republiky a Slovenska. 1. díl. *Klapalekiana*, 46: 1–363.

BÍLÝ, S., 1989: *Krascovití (Buprestidae).* Academia, Praha, 111 pp.

BOHÁČ, J., 1999: Staphylinid beetles as bioindicators. *Agriculture, Ecosystems & Environment*, 74: 357–372.

BOHÁČ, J., MATĚJÍČEK, J., ROUS R., 2005: Staphylinidae (drabčíkovití), pp. 435–449. In: FARKAČ, J., KRÁL, D., ŠKORPÍK, M. (eds): *Červený seznam ohrožených druhů České republiky*. AOPK ČR, Praha, 760 pp.

BOHÁČ, J., MATĚJÍČEK, J., ROUS, R., 2006: Checklist drabčíkovitých (Coleoptera, Staphylinidae) České republiky se zařazením druhů do skupin podle jejich ekologických nároků a citlivosti k antropogenním vlivům a podle stupně ohrožení. Available on-line at: http://www.jaroslavbohac.wz.cz/download/checklist_staphylinidae.pdf. (cited: 27. 1. 2011).

BOŽA, P., 2007: Dřepčíci (Coleoptera: Chrysomelidae: Alticinae) a nosatci (Coleoptera: Curculionidae) Přírodní památky Kamenná u Stařiče. *Práce a Studie Muzea Beskyd (Přírodní vědy)*, 19: 33–42.

BUKEJS, A., 2009: New data on little-known flea beetles (Coleoptera: Chrysomelidae: Alticinae) in the fauna of Latvia. *Baltic Journal of Coleopterology*, 9: 161–175.

ČÍŽEK, P., DOUGET, S., 2008: *Klíč k určování dřepčíků (Coleoptera: Chrysomelidae: Alticinae) Česka a Slovenska*. Městské muzem, Nové Město nad Metují, 232 pp.

DIECKMANN, L., 1980: Beiträge zur Insektenfauna der DDR: Coleoptera – Curculionidae (Brachycerinae, Otiorhynchinae, Brachyderinae). *Beiträge zur Entomologie*, 30: 145–310.

DIECKMANN, L., 1988: Beiträge zur Insektenfauna der DDR: Coleoptera – Curculionidae (Curculioninae: Ellescini, Acalyptini, Tychiini, Anthonomiini, Curculionini). *Beiträge zur Entomologie*, 38: 36–468.

DOGUET, S., 1993: Rehabilitation de Longitarsus helvolus Kutschera 1863, espèce distincte de Longitarsus membranaceus (Foudras 1860) (Col. Chrysomelidae). *Entomologica Gallica*, 4: 45–46.

FARKAČ, J., KRÁL, D., ŠKORPÍK, M. (eds), 2005: *Červený seznam ohrožených druhů České republiky. Bezobratlí*. AOPK ČR, Praha, 760 pp.

FORNŮSEK, R., ČÍŽEK, P., 2000: Příspěvek k poznání dřepčíků (Coleoptera: Chrysomelidae: Alticinae) Čech, Moravy, Slovenska a Maďarska I. *Klapalekiana*, 36: 29–32.

HAMET, A., VANCL, Z., BOUKAL, M., TRÁVNÍČEK, D., VAŠÍČKOVÁ, K., 2009: Brouci CHKO Moravský kras. *Acta Musealia Muzea Jihovýchodní Moravy ve Zlíně*, 9: 11–46.

HESOUN, P., JELÍNEK, A., KŘIVAN, V., 2008: Inventarizační průzkum vybraných skupin bezobratlých PP Toužinské stráně. *Acta Rerum Naturalium*, 5: 229–242.

HORÁKOVÁ, J., 2001: *Střevlíkovití (Carabidae) vybraných lokalit CHKO Moravský kras a jejich antropogenní ovlivnění.* Diploma thesis, AF MZLU, Brno, 43 pp.

HORÁKOVÁ, J., 2005: *Vybrané skupiny epigeické fauny závrtů CHKO Moravský kras a jejich antropogenní ovlivnění.* Ph.D. Thesis, AF MZLU Brno, 248 pp.

HORÁKOVÁ, J., HULA, V., PIKULA, J., 2005: Contribution to fauna of invertebrates of sink holes within the agricultural landscape of the Moravian Karst Protected Area. Part one: Carabidae (Coleoptera). *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis,* 52(5): 53–62.

JANUŠ, J., 2004: Výsledky faunistického inventarizačního průzkumu brouků (Coleoptera) čeledi Chrysomelidae s. lat. na území Chráněné krajinné oblasti a Biosférické rezervace Křivoklátsko. *Klapalekiana,* 40: 55–121.

KLAŠKOVÁ, J., 2005: *Diverzita a bioindikační využití střevlíkovitých a drabčíkovitých (Coleoptera: Carabidae, Staphylinidae) na antropogenně různě ovlivněných travnatých biotopech Moravského krasu.* Ph.D. thesis, AF MZLU, Brno, 140 pp.

KOCMÁNKOVÁ, E., 2005: *Společenstva střevlíkovitých (Carabidae) lučních biotopů Moravského krasu a jejich antropogenní ovlivnění*. Bachelor thesis, AF MZLU, Brno, 64 pp.

KOTOUČ, L., 2006: Natura 2000 v Moravském krasu a jeho okolí. *Ochrana přírody*, 61: 239–241.

KRÁSENSKÝ, P., 2005: Metody sběru brouků jako podklad pro inventarizaci bezobratlých. In: Metodika inventarizačních průzkumů maloplošných zvláště chráněných území, manuskritp AOPK, deposited in AOPK, Praha, 6 pp.

KŘIVAN, V., STEJSKAL, R., 2009: Zajímavé nálezy brouků (Coleoptera) z Českomoravské vrchoviny – 1. *Acta Rerum Naturalium*, 6: 29–34.

KŘIVAN, V., STEJSKAL, R., in prep.: Zajímavé nálezy brouků (Coleoptera) z Českomoravské vrchoviny – 2. will be send to *Acta rerum naturalium*, Jihlava.

LAIBNER, S., 2000: *Elateridae České a Slovenské republiky*. Kabourek, Zlín, 292 pp.

MAROTTA, O., OSELLA, G., 2004: Coleoptera, Curculionoidea (Anthribidae, Apionidae, Curculionidae, Dryophthoridae, Rhynchitidae), pp. 263–265. In: CERRETTI, P., HARDERSEN, S., MASON, F., NARDI, G., TISATO, M., ZAPPAROLI, M. (eds): *Invertebrati di una foresta della Pianura Padana, Bosco della Fontana, Secondo contributo. Conservazione Habitat Invertebrati, 3*. Cierre Grafica Editore, Verona. 303 pp.

NIEDOBOVÁ, J., HULA, V., ŠŤASTNÁ, P., 2011: Ground beetles (Carabidae) from slopes of Macošská stráň and Vilémovická stráň (Protected landscape area of Moravský kras, Czech republic). *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis,* 59(3): 143–149.

PETRYSZAK, B., BILINSKI, S., 1978: Uwagi o nowych i rzadkich gatunkach ryjkowców (Coleoptera, Curculionidae) z Polski. *Polskie Pismo Entomologiczne*, 48: 181–185.

PRUNER, L., MÍKA, P., 1996: Seznam obcí a jejich částí v České republice s čísly mapových polí pro síťové mapování fauny. *Klapalekiana*, 32: 1–175.

REJZEK, M., 2005: Cerambycidae (tesaříkovití), pp. 530–532. In: FARKAČ, J., KRÁL, D., ŠKORPÍK, M. (eds): *Červený seznam ohrožených druhů České republiky. Bezobratlí. AOPK ČR*, Praha, 760 pp.

SEDLÁČKOVÁ, J., HULA, V., PIKULA, J., 2009: Příspěvek k poznání fauny bezobratlých krasových závrtů v obhospodařované krajině CHKO Moravský Kras, pp. 20–27. In: SLÁMA, M. E. F., 1998: *Tesaříkovití – Cerambycidae České a Slovenské republiky (Brouci – Coleoptera).* Milan Sláma, Krhanice, 383 pp.

STEJSKAL, R., 2005a: Interesting records of some weevil species of the subfamily Lixinae (Coleoptera: Curculionidae) in southern Moravia with notes on their bionomics (Zajímavé nálezy několika druhů nosatců podčeledi Lixinae (Coleoptera: Curculionidae) na jižní Moravě s poznámkami k jejich bionomii). *Klapalekiana*, 41: 63–69.

STEJSKAL, R., 2005b: Faunistic Records from the Czech Republic 180. *Klapalekiana,* 41: 69–70.

STREJČEK, J., 1969: Příspěvek k poznání brouků čeledi Bruchidae, Urodontidae, Anthribidae a Curculionidae v Československu 2 (Contribution on the knowledge of Bruchidae, Urodontidae, Anthribidae and Curculionidae in Czechoslovakia 2). *Zprávy Československé Společnosti Entomologické při ČSAV*, 5: 83–88.

STREJČEK, J., 1993: Curculionidae, s. 135–152. In: JELÍNEK, J. (ed.): Check-list of Czechoslovak Insects IV (Coleoptera). Seznam československých brouků. *Folia Heyrovskyana*, Suppl. 1: 3–172.

STREJČEK, J., 2000a: *Katalog brouků (Coleoptera) Prahy. Svazek 1. Čeledi Chrysomelidae (s. lato), Bruchidae, Urodontidae.* Praha, 100 pp.

STREJČEK, J., 2000b: *Katalog brouků (Coleoptera) Prahy. Svazek 2. Anthribidae, Curculionidae (s. lato).* Praha, 142 pp.

STREJČEK, J., 2000c: Faunistic records from the Czech Republic 111. *Klapalekiana*, 36: 185–187.

STREJČEK, J., 2003: Nosatci a mandelinky, pp. 278–306. In: SEJÁK, J., DEJMAL, I. (eds): *Hodnocení a oceňování biotopů České republiky*. Český ekologický ústav, Praha, 428 pp.

STREJČEK, J., BEZDĚK, J., 2005: Chrysomelidae (mandelinkovití), pp. 533–539. In: FARKAČ, J., KRÁL, D., ŠKORPÍK, M. (eds): *Červený seznam ohrožených druhů České republiky. Bezobratlí.* AOPK ČR, Praha, 760 pp.

ŠKORPÍK, M., 2005: Buprestidae (krascovití), pp. 464–468. In: FARKAČ, J., KRÁL, D., ŠKORPÍK,

M. (eds): *Červený seznam ohrožených druhů České republiky. Bezobratlí.* AOPK ČR, Praha, 760 pp.

ŠPRYŇAR, P., DOLEŽAL, T., MIKULENKA, L., MORAVEC, P., PLECHÁČ, J., PLESKAČ, D., ŘÍHA, J., STREJČEK, J., ŠÍMA, A., TRMAL, A., URBAN, S., VONIČKA, P., ZÚBER, M., 2003: Příspěvek k poznání brouků (Insecta, Coleoptera) Českého krasu – výsledky Entomologických dnů 2002. *Bohemia Centralis*, 26: 97–135.

ŠŤASTNÁ, P., BEZDĚK, J., 2001: Brouci (Coleoptera) zjištění v zemních pastech v CHKO Moravský kras v letech 1999 a 2000. *Sborník přírodovědného klubu v Uherském Hradišti*, 6: 211–218.

TRÁVNÍČEK, D., BOUKAL, M., HAMET, A., VANCL, Z., CSÉFALVAY, R., VAŠÍČKOVÁ, K., 2008: Vodní brouci CHKO Moravský kras (Coleoptera: Gyrinidae, Haliplidae, Noteridae, Dytiscidae, Helophoridae, Hydrochidae, Hydrophilidae, Hydraenidae, Elmidae, Dryopidae, Heteroceridae). *Acta Musealia Muzea Jihovýchodní Moravy ve Zlíně*, 8: 34–58.

VÁVRA, J. CH., 2005: Elateridae (kovaříkovití), pp. 469–473. In: FARKAČ, J., KRÁL, D., D., ŠKORPÍK, M. (eds): *Červený seznam ohrožených druhů České republiky. Bezobratlí*. AOPK ČR, Praha, 760 pp.

WANAT, M., 2007: Nowe stanoviska Protapion gracilipes (Dietrich, 1857) (Coleoptera: Apionidae) w środkowej Polsce. *Wiadomosci Entomologiczne*, 26: 294.

VESELÝ, P., SKLÁDANKA, J. (eds), 2009: Management travních porostů krasových oblastí. Proceeding of International Conference, held in Moravský Kras PLA, from 16. To 18. September, MZLU v Brně, Brno, 80 pp.

WASOVSKA, M., 2006: Chrysomelid communities (Chrysomelidae, Coleoptera) of xerothermic grasslands (Inuletum ensifoliae) in the Wyzyna Niechowska Uplands (Central Poland). *Biologia,* 61: 565–572.

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