

Minute moss beetles and riffle beetles (Coleoptera: Hydraenidae, Elmidae) of the Bílé Karpaty Protected Landscape Area and Biosphere Reserve (Czech Republic)

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STRAKA M., KOMZÁK P., BOUKAL D. & TRÁVNÍČEK D. 2012: Minute moss beetles and riffle beetles (Coleoptera: Hydraenidae, Elmidae) of the Bílé Karpaty Protected Landscape Area and Biosphere Reserve (Czech Republic). In: MALENOVSKÝ I., KMENT P. & KONVIČKA O. (eds.): Species inventories of selected insect groups in the Bílé Karpaty Protected Landscape Area and Biosphere Reserve (Czech Republic). *Acta Musei Moraviae, Scientiae biologicae* (Brno) **96(2)** (2011): 667–689. – Eighteen species of Hydraenidae and ten species of Elmidae were recorded at 89 sites in the Bílé Karpaty Protected Landscape Area and Biosphere Reserve (south-eastern Moravia, Czech Republic) in the course of surveys in 1994–2010. Three additional species of Hydraenidae are known from the area only from historical records. *Ochthebius colveranus* Ferro, 1979 is recorded for the first time for the Czech Republic; this is a most surprising discovery, together with *Hydraena rufipes* Curtis, 1830, the finding of which has been already reported elsewhere. Moreover, we confirm the recent occurrence of *Hydraena minutissima* Stephens, 1829 and *Ochthebius metallescens* Rosenhauer, 1847 in Moravia. The complete list of published and new records from the area is supplemented by brief notes on the ecology and conservation status of each species. Two of the species recorded are classified as endangered (*Hydraena pulchella* Germar, 1824, *Ochthebius metallescens* Rosenhauer, 1847), three as vulnerable (*Hydraena morio* Kiesenwetter, 1849, *Elmis obscura* (Ph. Müller, 1806) and *Riolus cupreus* (Ph. Müller, 1806)) and two as near-threatened (*Hydraena belgica* Orchymont, 1930 and *Hydraena schuleri* Ganglbauer, 1901) in the Red List of threatened invertebrates of the Czech Republic. These results show that the area is particularly rich in the running water fauna of the Hydraenidae and Elmidae.

Key words. Aquatic beetles, Coleoptera, Hydraenidae, Elmidae, faunistics, biogeography, new records, species conservation, aquatic habitats, White Carpathians, Moravia, Czech Republic

Introduction

This paper addresses two families of water beetles, the Hydraenidae and the Elmidae, that are common and speciose in running waters, including those of the Bílé Karpaty Protected Landscape Area and Biosphere Reserve in south-eastern Moravia, Czech Republic (hereafter abbreviated to Bílé Karpaty PLA).

The Hydraenidae (minute moss beetles) are cosmopolitan, with over 20 genera and more than 1,000 described species. The adults of most of them are riparian or aquatic and may be found in standing water, running water and hygropetric habitats. Some appear to

be amphibious (facultatively aquatic) or riparian (JÄCH 1998). Their body is usually elongate or long-oval and the size of the Czech species varies between 1.0 and 2.7 mm (BOUKAL *et al.* 2007). They have elongated maxillary palpi that fulfil the sensory function of antennae. The antennae themselves are short and clubbed and play an important role in breathing in species that live close to the water surface (JÄCH *et al.* 2005a). The larvae are not usually aquatic and presumably live in wet habitats close to water. Fifty-two species have been confirmed from the Czech Republic (BOUKAL *et al.* 2007, STRAKA 2010). Another species is reported here for the first time, increasing that number to 53 for the Czech Republic.

The Elmidae (riffle beetles), traditionally divided into the subfamilies Elminae and Larinae, are also cosmopolitan with *ca.* 120 genera and more than 1,200 species (JÄCH & KODADA 1995). Adults and larvae are largely aquatic, although the adults of many Larinae are often encountered a little above the water line or in the spray zones of waterfalls and cascades. Riffle beetles generally occupy lotic habitats and only a few species are to be found in lakes or ponds (JÄCH 1998). The adults of the central European Elminae are small, only 1.3–5.0 mm long, subparallel to ovate in body shape, and brownish to black in colour. All of them are strongly sclerotized and have long, strong legs with strong claws. Altogether 19 species of the family Elmidae are currently known from the Czech Republic (BOUKAL *et al.* 2007).

The Bílé Karpaty PLA covers the Czech (Moravian) part of the White Carpathian Mts. [Bílé Karpaty] extending along the Czech-Slovak border. The general characteristics of the natural conditions in the area are given in KUČA *et al.* (1992), MACKOVČIN & JATIOVÁ (2002), JONGEPIEROVÁ (2008) and KONVIČKA *et al.* (2011). Previous records of the Hydraenidae and Elmidae from the Bílé Karpaty PLA and neighbouring areas are surprisingly scarce. The first author to mention the genus *Hydraena* Kugelann, 1794 in the White Carpathian Mts. was HRBÁČEK (1951), but he gave no concrete data. KODADA (1992) briefly reported on the aquatic beetles from the eastern part of the White Carpathian Mts. in Slovakia. An early record of *Ochthebius crenulatus* Mulsant et Rey, 1850 from Valašské Klobouky (see also Discussion) and one recent record of *Riolus cupreus* (Ph. Müller, 1806) from a stream near Suchov were mentioned in the Catalogue of Water Beetles of the Czech Republic (BOUKAL *et al.* 2007). The recent discovery of *Hydraena rufipes* Curtis, 1830 in the Czech Republic, based on specimens from streams near Radějov, was published by STRAKA (2010). Finally, TRÁVNÍČEK (2010) reported several species of the Hydraenidae in his survey of one type of standing water habitat.

The purpose of this study is to present the results of recent extensive surveys of running and standing waters in the Bílé Karpaty PLA and summarize current knowledge of the distribution of the Elmidae and Hydraenidae in the area.

Material and methods

Almost all the data presented here were gathered after 1994 and most of them derive from after 2006, with much of the collecting activity taking place in 2010. Almost all the specimens reported as new records in this study were obtained from flowing waters by

kick sampling. This method relies on disturbing the stream bed; the beetles, carried with dislodged particles and debris down the current, are collected in a hand-net. The contents of the net are immediately placed on white canvas and inspected for beetles.

Many records taken by P. Komzák, P. Pařil, M. Straka and S. Větríček were obtained as part of a standard monitoring programme, in which a three-minute multihabitat sample is taken and fixed with formaldehyde and then processed in the lab (KOKEŠ & NĚMEJCOVÁ 2006). Unfortunately the samples from such monitoring are stored for only a limited period of time or immediately discarded, and voucher specimens are usually not available. These records are abbreviated as NC. All other specimens are to be found in the following nine collections, abbreviated as:

DBC	David Boukal collection, České Budějovice
JKVC	Josef Kadlec collection, Varnsdorf
LMTC	Ladislav Mencl collection, Týnec nad Labem
NMPC	National Museum, Prague (Martin Fikáček and Petr Kment collections)
MHBC	Michal Horsák collection, Brno
MJMZ	Museum of South-eastern Moravia in Zlín, Zlín (Dušan Trávníček collection)
MSHC	Michal Straka collection, Hustopeče
PKBC	Petr Komzák collection, Brno
SVBC	Stanislav Větríček collection, Brno
TSOC	Tomáš Sitek collection, Ostrava

The following additional abbreviations are used in the text: NM – Nature Monument, NNM – National Nature Monument, NNR – National Nature Reserve, NR – Nature Reserve, PLA – Protected Landscape Area (all of these are the various categories and terms specified by the Czech system of legally protected natural areas); CR – critically endangered, EN – endangered, VU – vulnerable, NT – near-threatened, DD – data deficient (the latter five relate to the categories in the Red List of threatened invertebrates of the Czech Republic, *cf.* FARKAČ *et al.* 2005, updated by BOUKAL *et al.* 2007; species found after 2007 are treated as DD); spec. – number of voucher specimens (not sexed).

The system, nomenclature and classification into the conservation categories used in this paper follow BOUKAL *et al.* (2007).

List of collecting sites

The material was collected at 89 localities, which are listed below (see also Fig. 1). Each entry in the list is arranged as follows: number of locality, name of the nearest village or town, local name of the collecting site (usually the name of a stream or the name of a small-scale protected area – reserve), code of the field (in parentheses) in the faunistic and floristic grid mapping system of central Europe (EHRENDORFER & HAMANN 1965, PRUNER & MÍKA 1996, each basic field divided into 16 subfields, *cf.* KONVIČKA *et al.* 2011), GPS coordinates, altitude, and habitat (if this is not evident from the name of the site itself).

1. Dolní Lhota, Luhačovický potok stream (6872d2), 49°07'34"N 17°47'51"E, 285 m a.s.l.
2. Petrůvka, Kladenka springs (6872d4), 49°06'11"N 17°49'17"E, 460 m a.s.l.
3. Petrůvka, Petrůvka stream (6872d4), 49°07'15"N 17°48'00"E, 315 m a.s.l.
4. Haluzice, Václavský potok stream (6873c2), 49°08'05"N 17°53'21"E, 470 m a.s.l.; spring.
5. Slavičín, Lukšinka stream (6873c3), 49°06'19"N 17°52'17"E, 380 m a.s.l.
6. Vlachovice, Sviborka stream (6873d1), 49°08'19"N 17°55'40"E, 350 m a.s.l.
7. Vlachovice, Vlára stream (6873d1), 49°07'57"N 17°56'10"E, 347 m a.s.l.
8. Vrbětice, Václavský potok stream (6873d3), 49°06'17"N 17°56'12"E, 340 m a.s.l.
9. Vrbětice, Vlára stream (6873d3), 49°06'18"N 17°56'15"E, 335 m a.s.l.
10. Poteč (6874a4), 49°09'40"N 18°02'39"E; stream.
11. Poteč, left tributary of Brumovka stream (6874c2), 49°08'40"N 18°03'45"E, 630 m a.s.l.; stream.
12. Brumov-Bylnice, Brumovka stream (6874c3), 49°06'11"N 18°01'37"E, 338 m a.s.l.
13. Brumov-Bylnice, Hložecký potok stream (6874c3), 49°06'07"N 18°00'02"E, 380 m a.s.l.
14. Valašské Klobouky, Bílé potoky NR (6874c3), 49°06'55"N 18°01'39"E, 450 m a.s.l.; spring fen.
15. Valašské Klobouky, nameless stream 600 m NW from Vrchy hill (6874c3), 49°07'27"N 18°02'05"E.
16. Návojná, Návojná stream (6874c4), 49°07'14"N 18°03'03"E, 415 m a.s.l.
17. Záhorovice, Kladenka stream (6972d1), 49°01'53"N 17°45'48"E, 245 m a.s.l.
18. Bojkovice, Koménka stream (6972d2), 49°01'52"N 17°48'20"E, 275 m a.s.l.
19. Nezdenice (6972d3), 49°00'35"N 17°45'20"E, 300 m a.s.l.; lake in quarry and its outflow.
20. Bojkovice, Koménka stream (6972d4), 49°01'11"N 17°48'03"E, 300 m a.s.l.
21. Slavičín (6973a1), 49°05'32"N 17°52'06"E, 370 m a.s.l.; pool in abandoned brick plant.
22. Hostětín, Kolelač stream (6973a3), 49°03'27"N 17°51'41"E, 335 m a.s.l.
23. Vrbětice (6973b1), 49°06'02"N 17°56'18"E, 370 m a.s.l.; recently created pool.
24. Vrbětice (6973b1), 49°06'02"N 17°56'18"E, 370 m a.s.l.; short reach of a stream.
25. Rokytnice, right tributary of Rokytenka stream (6973b3), 49°03'25"N 17°55'18"E, 370 m a.s.l.; stream.
26. Popov, Zelenský potok stream (6973b4), 49°04'03"N 17°58'48"E, 325 m a.s.l.
27. Štítná nad Vláří, Zelenský potok stream (6973b4), 49°03'14"N 17°58'23"E, 380 m a.s.l.
28. Pitín, Olšava stream (6973c1), 49°01'41"N 17°52'32"E, 390 m a.s.l.
31. Sidonie, Vlára stream (6974c2), 49°02'14"N 18°03'02"E, 290 m a.s.l.
32. Sidonie, Vlárka stream (6974c2), 49°02'06"N 18°03'50"E, 290 m a.s.l.
33. Svatý Štěpán, Vlára stream (6974c2), 49°02'12"N 18°03'03"E, 280 m a.s.l.
34. Korytná, Březí (7071d2), 48°55'38"N 17°39'36"E, 380–410 m a.s.l.; stream.
35. Horní Němčí, Kazivec stream (7071d3), 48°54'04"N 17°37'24"E, 495 m a.s.l.; stream.
36. Suchov, Kazivec stream (7071d3), 48°54'16"N 17°36'51"E, 470 m a.s.l.
37. Horní Němčí, Okluky stream (7071d4), 48°55'11"N 17°37'48"E, 360 m a.s.l.
38. Suchov, Suchovské Mlýny, right tributary of Kazivec stream (7071d4), 400 m a.s.l.; stream.
39. Korytná, Lubná pond (7072), 48°56'44"N 17°40'51"E, 320 m a.s.l.
40. Komňa, Bučník quarry (7072b1), 48°58'48"N 17°47'28"E, 450–540 m a.s.l.; pools.
41. Komňa, Koménka stream (7072b2), 48°59'17"N 17°47'35"E, 391 m a.s.l.
42. Komňa, Lom Rasová NM (7072b2), 48°58'34"N 17°48'43"E, 540 m a.s.l.; pool in abandoned quarry.
43. Lopeník, Nivnička stream (7072b3), 48°57'17"N 17°46'48"E, 570 m a.s.l.; spring and stream.
44. Korytná, Lubná stream (7072c1), 48°56'50"N 17°40'49"E, 310 m a.s.l.
45. Březová, Cestiska NM (7072c2), 48°55'44"N 17°43'49"E, 480–510 m a.s.l.; data on habitat unavailable.
46. Březová, Hradecký járek (7072c2), 48°56'07"N 17°43'06"E, 630 m a.s.l.; spring.
47. Strání, Klanečnice stream (7072c3), 48°54'22"N 17°40'17"E, 427 m a.s.l.
48. Lopeník, Hrubý Mechnáč (7072d2), 48°56'33"N 17°47'54"E, 700 m a.s.l.; spring fen.
49. Lopeník, stream under Mechnáč (7072d2), 48°56'48"N 17°47'50"E, 640 m a.s.l.

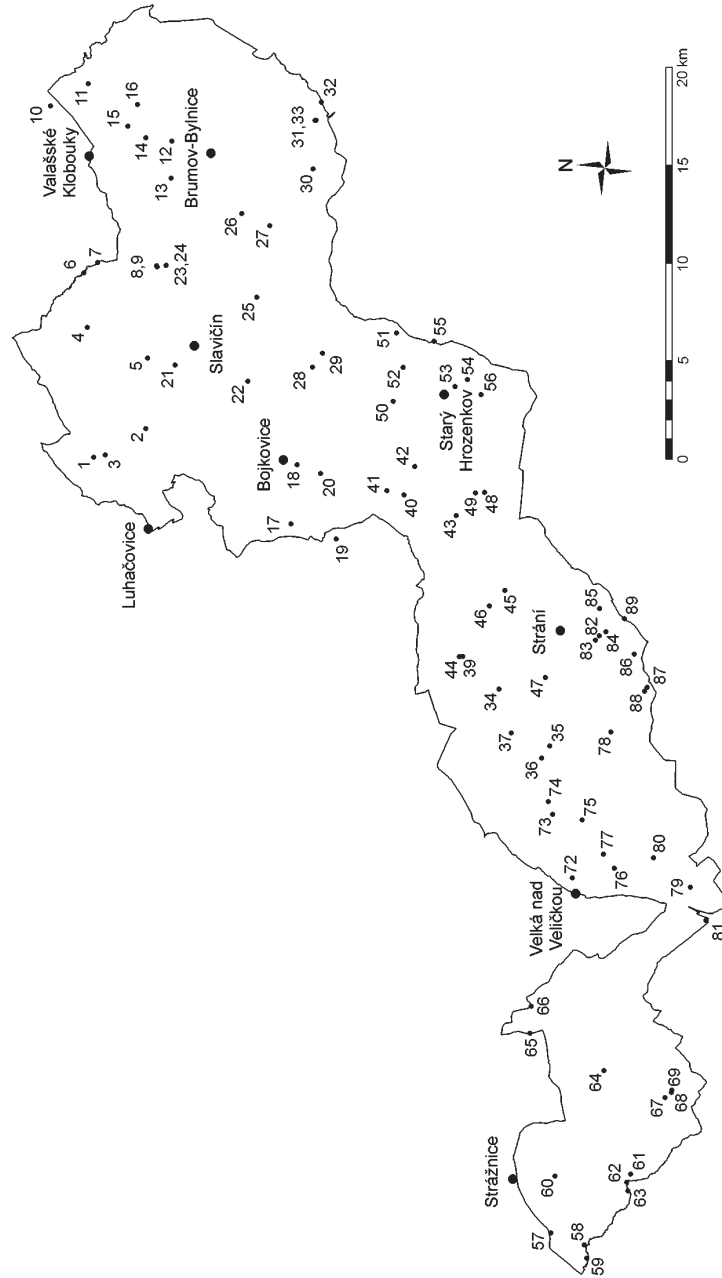


Fig. 1. A simplified map of the Bílé Karpaty Protected Landscape Area with the location of sites studied.

50. Žitková, Vlčí potok stream (7073a1), 48°59'20"N 17°51'24"E, 590 m a.s.l.
51. Žitková, Hutě NR (7073a2), 48°59'25"N 17°54'19"E, 450 m a.s.l.; spring fen.
52. Žitková, Pod Žitkovským vrchem NR (7073a2), 48°59'09"N 17°52'53"E, 590 m a.s.l.; helocrene spring.
53. Starý Hrozenkov, Krátkovský potok stream (7073a3), 48°57'39"N 17°52'16"E, 360 m a.s.l.
54. Starý Hrozenkov, Drietomice stream (7073a4), 48°57'19"N 17°52'37"E, 360 m a.s.l.
55. Žitková, Žitkovský potok stream (7073a4), 48°58'21"N 17°54'06"E, 380 m a.s.l.
56. Starý Hrozenkov, right tributary of Drietomice stream (7073c1), 48°56'54"N 17°52'02"E, 390 m a.s.l.; stream.
57. Petrov, Radějovka stream (7169b1), 48°52'43"N 17°16'47"E, 175 m a.s.l.
58. Sudoměřice, Sudoměřický potok stream valley (7169b3), 48°51'45"N 17°16'25"E, 200 m a.s.l.; pool.
59. Sudoměřice, Sudoměřický potok stream (7169b3), 48°51'39"N 17°15'52"E, 190 m a.s.l.
60. Strážnice, Radějovka stream (7169b4), 48°52'46"N 17°19'12"E, 200 m a.s.l.
61. Radějov, Mandát stream (7169d2), 48°50'39"N 17°19'36"E, 260 m a.s.l.
62. Radějov, Mlýnky (7169d2), 48°50'44"N 17°19'15"E, 250 m a.s.l.; data on habitat unavailable.
63. Radějov, Sudoměřický potok stream (7169d2), 48°50'41"N 17°18'53"E, 252 m a.s.l.
64. Tvarožná Lhota, Járkovec stream (7170a4), 48°51'41"N 17°23'52"E, 300 m a.s.l.
65. Hroznová Lhota, Velička stream (7170b1), 48°53'51"N 17°25'09"E, 195 m a.s.l.
66. Lipov, Kuželovský potok stream (7170b1), 48°53'53"N 17°26'18"E, 210 m a.s.l.
67. Radějov, Kútky NR (7170c1), 48°49'54"N 17°22'59"E, 380 m a.s.l.; helocrene spring.
68. Radějov, Kútky NR (7170c1), 48°49'44"N 17°23'14"E, 370 m a.s.l.; pond near forest edge.
69. Radějov, Kútky NR (7170c1), 48°49'44"N 17°23'20"E, 375 m a.s.l.; stream above pond.
70. Javorník, Hrubý potok stream (7171), 400 m a.s.l.; other data unavailable.
71. Velká nad Veličkou, Jamný potok stream (7171a4); other data unavailable.
72. Velká nad Veličkou, Zahrady pod Hájem NNR (7171a1), 48°53'05"N 17°31'54"E, 320 m a.s.l.; helocrene spring.
73. Suchov, Kazivec stream (7171a2), 48°53'48"N 17°34'31"E, 378 m a.s.l.
74. Suchov, Kazivec stream (7171a2), 48°53'58"N 17°35'02"E, 410 m a.s.l.
75. Suchov, Velička stream (7171a2), 48°52'58"N 17°34'24"E, 360 m a.s.l.
76. Javorník, Velička stream (7171a3), 48°51'56"N 17°32'29"E, 323 m a.s.l.
77. Javorník, Velička stream near Petruchovy Mlýny (7171a4), 48°52'17"N 17°33'02"E, 340 m a.s.l.
78. Nová Lhota-Vápenky, Velička stream (7171b4), 48°52'24"N 17°38'14"E, 427 m a.s.l.
79. Javorník, Machová NR (7171c1), 48°49'46"N 17°31'59"E (center of the reserve, precise location of the collecting site unknown), 380–570 m a.s.l.; data on habitat unavailable.
80. Javorník, Hrubý potok stream (7171c2), 48°50'52"N 17°33'05"E, 370 m a.s.l.
81. Javorník, Teplica stream (7171c3), 48°49'14"N 17°30'39"E, 341 m a.s.l.
82. Strání, Mechnáčky NM – large pool in central part of the reserve (7172a1), 48°52'58"N 17°42'16"E, 480 m a.s.l.
83. Strání, Mechnáčky NM – pool at the edge of the reserve (7172a1), 48°53'04"N 17°42'04"E, 510 m a.s.l.
84. Strání-Květná, Svinárský potok stream (7172a1), 48°52'48"N 17°42'28"E, 400 m a.s.l.
85. Strání-Květná, Klanečnice stream (7172a2), 48°53'02"N 17°43'25"E, 350 m a.s.l.
86. Strání, Javorina NNR, Svinárský potok stream (7172a3), 48°51'57"N 17°41'38"E, 800 m a.s.l.
87. Nová Lhota-Vápenky, Javorina NNR – Velička springs (7172a3), 48°51'30"N 17°40'16"E, 880 m a.s.l.
88. Nová Lhota-Vápenky, Velička stream – crossing road on the border of Javorina NNR (7172a3), 48°51'34"N 17°40'06"E.
89. Strání-Květná, right tributary of Klanečnice stream (7172a4), 48°52'19"N 17°43'05"E; stream.

Annotated list of species

All the material examined for each species is listed; individual records are ordered according to the number of the collecting site. For previously published data, only localities are provided. For unpublished material, each record is arranged as follows: name of the collecting site and its number (in parentheses), date(s) of collection(s), number of specimens, person who collected and identified the material, and place of deposition of the material (in parentheses).

Family HYDRAENIDAE

Hydraena belgica Orchymont, 1930

(NT)

Material examined. Slavičín, Lukšinka stream (5), 4.ix.2010, 1 ♂, M. Straka lgt. & det. (MSHC). Vlachovice, Sviborka stream (6), 4.ix.2010, 2 spec., M. Straka lgt. & det. (MSHC). Vrbětice, Václavský potok stream (8), 8.v.2010, 17 spec., M. Straka lgt. & det. (MSHC). Poteč (10), 21.v.1999, 1 ♂, M. Horský lgt., D. Boukal det. (DBCB). Brumov-Bylnice, Hložecký potok stream (13), 10.iv.2008, 1 ♀, M. Straka lgt. & det. (MSHC). Záhorovice, Kladenka stream (17), 8.v.2010, 2 spec., M. Straka lgt. & det. (MSHC). Sudoměřice, Sudoměřický potok stream (59), 25.viii.2009, 2 spec., M. Straka lgt. & det. (MSHC). Nová Lhota-Vápenky, Velička stream (78), 3.iv.2007, 1 ♀, M. Straka lgt. & det. (MSHC).

Distribution and frequency in the Bílé Karpaty PLA: Found throughout the area, but most records come from its northern part. **General distribution:** European. **Habitat preferences:** Rhitral. **Red List status:** NT.

Comments. Rare in the Czech Republic and known only from a few localities in Bohemia, more common in eastern and central Moravia. It lives in gravel in moderately flowing streams from lowlands to hills (BOUKAL *et al.* 2007).

Hydraena excisa Kiesenwetter, 1849

Published records. TRÁVNÍČEK (2010): Vrbětice (24).

Additional material examined. Dolní Lhota, Luhačovický potok stream (1), 24.v.2006, 3 spec., P. Komzák lgt. & det. (NC). Petrůvka, Petrůvka stream (3), 5.x.2006, 2 spec., M. Straka lgt. & det. (MSHC). Haluzice, Václavský potok stream (4), 4.ix.2010, 1 spec., M. Straka lgt. & det. (MSHC). Slavičín, Lukšinka stream (5), 4.ix.2010, 34 spec., M. Straka lgt. & det. (MSHC). Vlachovice, Sviborka stream (6), 4.ix.2010, 24 spec., M. Straka lgt. & det. (MSHC). Vlachovice, Vlára stream (7), 25.v.2006, 1 ♂ 1 ♀, P. Komzák lgt. & det. (PKBC). Vrbětice, Václavský potok stream (8), 8.v.2010, 6 spec., M. Straka lgt. & det. (MSHC). Vrbětice, Vlára stream (9), 8.v.2010, 1 spec., M. Straka lgt. & det. (MSHC). Brumov-Bylnice, Hložecký potok stream (13), 10.iv.2008, 1 ♀, M. Straka lgt. & det. (MSHC). Záhorovice, Kladenka stream (17), 8.v.2010, 8 spec., M. Straka lgt. & det. (MSHC). Bojkovice, Koménka stream (18), 24.ix.2009, 4 spec., P. Komzák lgt. & det. (NC). Hostětín, Kolelač stream (22), 8.x.2008, 12 spec., P. Komzák lgt. & det. (NC). Rokytnice, right tributary of Rokytěnka stream (25), 4.ix.2009, 6 spec., M. Straka lgt. & det. (MSHC). Popov, Zelenský potok stream (26), 5.v.2009, 2 spec., S. Větríček lgt. & det. (NC). Štítná nad Vláří, Zelenský potok stream (27), 4.ix.2010, 3 spec., M. Straka lgt. & det. (MSHC).

Distribution and frequency in the Bílé Karpaty PLA: Not rare in the area, but all records come from its northern part (north of Bojkovice). **General distribution:** European. **Habitat preferences:** Rhitral. **Red List status:** –.

***Hydraena gracilis* Germar, 1824**

Published records. TRÁVNÍČEK (2010): Horní Němčí, Kazivec stream (35); Suchov, Kazivec stream (36, 74); Radějov, Kútky NR (69).

Additional material examined. Petrůvka, Petrůvka stream (3), 25.iv.2006, 1 spec., M. Straka lgt. & det. (NC). Slavičín, Lukšinka stream (5), 4.ix.2010, 1 spec., M. Straka lgt. & det. (MSHC). Vlachovice, Sviborka stream (6), 4.ix.2010, 5 spec., M. Straka lgt. & det. (MSHC). Vrbětice, Václavský potok stream (8), 8.v.2010, 5 spec., M. Straka lgt. & det. (MSHC). Brumov-Bylnice, Hložecký potok stream (13), 25.iv.2006, 8 spec., M. Straka lgt. & det. (MSHC). Valašské Klobouky, nameless stream 600 m NW from Vrchy hill (15), 10.vi.1997, 1 ♂, D. Trávníček lgt. & det. (MJMZ). Návojná, Návojná stream (16), 25.iv.2006, 4 spec., M. Straka lgt. & det. (MSHC). Záhorovice, Kladenka stream (17), 8.v.2010, 2 spec., M. Straka lgt. & det. (MSHC). Bojkovice, Koménka stream (18), 24.ix.2009, 4 spec., P. Komzák lgt. & det. (NC). Bojkovice, Koménka stream (20), 8.v.2010, 6 spec. M. Straka lgt. & det. (MSHC). Hostětín, Kolelač stream (22), 8.x.2008, 2 spec., P. Komzák lgt. & det. (NC). Rokytnice, right tributary of Rokytenska stream (25), 4.ix.2010, 2 spec., M. Straka lgt. & det. (MSHC). Popov, Zelenský potok stream (26), 5.v.2009, 18 spec., S. Větríček lgt. & det. (NC). Štítná nad Vláří, Zelenský potok stream (27), 4.ix.2010, 28 spec., M. Straka lgt. & det. (MSHC). Pitín, Olšava stream (28), 8.v.2010, 3 spec., M. Straka lgt. & det. (MSHC). Pitín, Olšava stream (29), 12.iv.2008, 3 spec., M. Straka lgt. & det. (NC). Svatý Štěpán, Bukový potok stream (30), 24.iv.2006, 1 spec., M. Straka lgt. & det. (MSHC). Sidonie, Vlára stream (31), 24.ix.2009, 2 spec., P. Komzák lgt. & det. (NC). Sidonie, Vlárka stream (32), 24.ix.2009, 28 spec., S. Větríček lgt. & det. (NC). Svatý Štěpán, Vlára stream (33), 23.ix.2007, 1 spec., M. Straka lgt. & det. (NC). Horní Němčí, Okluky stream (37), 24.iv.2006, 8 spec., M. Straka lgt. & det. (MSHC). Komňa, Koménka stream (41), 15.v.2010, 13 spec., M. Straka lgt. & det. (MSHC). Korytná, Lubná stream (44), 15.v.2010, 2 spec., M. Straka lgt. & det. (MSHC). Strání, Klanečnice stream (47), 24.iv.2006, 2 spec., M. Straka lgt. & det. (MSHC). Lopeník, stream under Mechnáč (49), 30.viii.2006, 1 ♀, M. Straka lgt. & det. (MSHC). Starý Hrozenkov, Krátkovský potok stream (53), 5.x.2009, 30 spec., P. Komzák lgt. & det. (NC). Starý Hrozenkov, Drietomice stream (54), 3.v.2005, 3 ♂♂ 5 ♀♀, P. Pařil lgt., D. Boukal det. (DBCB); 6.v.2009, 70 spec., P. Komzák lgt. & det. (NC). Žitková, Žitkovský potok stream (55), 5.x.2009, 52 spec., P. Komzák lgt. & det. (NC). Starý Hrozenkov, right tributary of Drietomice stream (56), 24.iv.2006, 4 spec., M. Straka lgt. & det. (MSHC). Petrov, Radějovka stream (57), 9.x.2008, 4 spec., P. Komzák lgt. & det. (NC). Sudoměřice, Sudoměřický potok stream (59), 5.v.2009, 2 spec., S. Větríček lgt. & det. (NC); 25.viii.2009, 11 spec., M. Straka lgt. & det. (MSHC). Strážnice, Radějovka stream (60), 4.vi.2009, 11 spec., M. Straka lgt. & det. (MSHC). Radějov, Mandát stream (61), 25.ix.2010, 22 spec., M. Straka lgt. & det. (MSHC). Radějov, Sudoměřický potok stream (63), 30.iv.2007, 3 spec., M. Straka lgt. & det. (NC). Tvarožná Lhota, Járkovce stream (64), 30.vi.2007, 3 ♂♂ 1 ♀, Josef Kadlec lgt., D. Boukal det. (JKVC); 25.ix.2010, 6 spec., M. Straka lgt. & det. (MSHC). Hroznová Lhota, Velička stream (65), 25.ix.2010, 1 spec., M. Straka lgt. & det. (MSHC). Javorník, Hrubý potok stream (70), 3.x.1996, 6 ♀♀, L. Mencl lgt., D. Boukal det. (LMTC). Velká nad Veličkou, Jamný potok stream (71), 24.v.1995, 1 ♂, D. Trávníček lgt. & det. (MJMZ). Suchov, Kazivec stream (73), 3.iv.2007, 25 spec., M. Straka lgt. & det. (NC). Javorník, Velička stream (76), 18.x.2008, 8 spec., P. Komzák lgt. & det. (NC). Javorník, Velička stream near Petruchovy Mlýny (77), 3.x.1996, 2 ♂♂, 3 ♀♀, L. Mencl lgt., D. Boukal det. (LMTC); 25.ix.2010, 10 spec., M. Straka lgt. & det. (MSHC). Nová Lhota-Vápenky, Velička stream (78), 3.iv.2007, 20 spec., M. Straka lgt. & det. (NC). Javorník, Hrubý potok stream (80), 4.v.2009, 5 spec., P. Komzák lgt. & det. (NC). Javorník, Teplíca stream (81), 19.ix.2006, 20 spec., P. Komzák lgt. & det. (NC). Strání-Květná, Svinárský potok stream (84), 15.v.2010, 12 spec., M. Straka lgt. & det. (MSHC). Strání-Květná, Klanečnice stream (85), 6.x.2009, 7 spec., P. Komzák lgt. & det. (NC).

Distribution and frequency in the Bílé Karpaty PLA: The most common *Hydraena* species in the Czech Republic and also in the Bílé Karpaty PLA. Distributed throughout the area in all types of flowing waters. **General distribution:** European. **Habitat preferences:** Rhitral. **Red List status:** –.

Comments. All males that were dissected belong to the nominotypical subspecies *Hydraena gracilis gracilis* Germar, 1824.

Hydraena melas Dalla Torre, 1877

Published records. TRÁVNÍČEK (2010): Nezdenice (19); Slavičín (21); Vrbětice (23, 24); Radějov, Kútky NR (67).

Additional material examined. Horní Němčí, Kazivec stream (35), 4.x.2006, 1 spec., M. Straka lgt. & det. (MSHC). Lopeník, stream under Mechnáč (49), 30.viii.2006, 1 ♂, M. Straka lgt. & det. (MSHC). Javorník, Velička stream near Petruchovy Mlýny (77), 25.ix.2010, 5 spec., M. Straka lgt. & det. (MSHC). Nová Lhota-Vápenky, Velička stream (78), 25.ix.2007, 1 ♂, M. Straka lgt. & det. (NC). Javorník, Teplica stream (81), 19.ix.2006, 1 ♂, P. Komzák lgt. & det. (PKBC).

Distribution and frequency in the Bílé Karpaty PLA: Not very common, with localities scattered across the area. **General distribution:** European. **Habitat preferences:** Semiaquatic, euryecious, but more commonly found in standing water. **Red List status:** –.

Hydraena minutissima Stephens, 1829

Material examined. Vrbětice, Václavský potok stream (8), 8.v.2010, 3 spec., M. Straka lgt. & det. (MSHC). Javorník, Velička stream near Petruchovy Mlýny (77), 25.ix.2010, 3 spec., M. Straka lgt. & det. (MSHC).

Distribution and frequency in the Bílé Karpaty PLA: Found at two relatively distant sites: the Velička stream in the south and the Václavský potok stream near the northern border of the area. **General distribution:** European. **Habitat preferences:** Rhitral, xylobiont, mostly in warmer streams. **Red List status:** –.

Comments. A rare species in the Czech Republic, known only from six localities in Bohemia after 1961 (BOUKAL *et al.* 2007). The present records from the Bílé Karpaty PLA confirm its recent occurrence in Moravia. Its apparent scarcity may be partly caused by insufficient research as *H. minutissima* has been recently found also at some other localities in Moravia (M. STRAKA, unpublished data).

Hydraena morio Kiesenwetter, 1849

(VU)

Published record. KŘOUPALOVÁ *et al.* (2011): Valašské Klobouky, Bílé potoky NR (14).

Material examined. Petrůvka, Kladenka springs (2), 8.v.2010, 10 spec., M. Straka lgt. & det. (MSHC). Haluzice, Václavský potok stream (4), 4.ix.2010, 7 spec., M. Straka lgt. & det. (MSHC). Valašské Klobouky, Bílé potoky NR (14), 4.vii.2006, 3 ♂♂ 1 ♀, M. Straka lgt. & det. (MSHC). Štítná nad Vláří, Zelenský potok stream (27), 4.ix.2010, 1 ♂, M. Straka lgt. & det. (MSHC). Lopeník, Nivnička stream (43), 15.v.2010, 13 spec., M. Straka lgt. & det. (MSHC). Lopeník, Hrubý Mechnáč (48), 3.vii.2006, 1 spec., J. Bojková lgt., M. Straka det. (MSHC).

Distribution and frequency in the Bílé Karpaty PLA: Uncommon; found at suitable localities that receive cold water throughout the year. **General distribution:** Central and south-eastern Europe. **Habitat preferences:** Crenophilous. **Red List status:** VU.

Comments. *Hydraena morio* has only been known from about nine localities in Bohemia and four localities in Moravia so far (BOUKAL *et al.* 2007). Usually, it inhabits small springs and hypocrenal streamlets, often with muddy substrate.

***Hydraena nigrita* Germar, 1824**

Published records. TRÁVNÍČEK (2010): Vrbětice (24); Horní Němčí, Kazivec stream (35); Suchov, Kazivec stream (36, 74); Radějov, Kútky NR (68, 69). KŘOUPALOVÁ *et al.* (2011): Valašské Klobouky, Bílé potoky NR (14).

Additional material examined. Petrůvka, Kladenska springs (2), 8.v.2010, 11 spec., M. Straka lgt. & det. (MSHC). Petrůvka, Petrůvka stream (3), 5.x.2006, 1 ♂ 1 ♀, M. Straka lgt. & det. (MSHC). Haluzice, Václavský potok stream (4), 4.ix.2010, 1 spec., M. Straka lgt. & det. (MSHC). Slavičín, Lukšinka stream (5), 4.ix.2010, 20 spec., M. Straka lgt. & det. (MSHC). Vlachovice, Sviborka stream (6), 4.ix.2010, 4 spec., M. Straka lgt. & det. (MSHC). Vrbětice, Václavský potok stream (8), 8.v.2010, 4 spec., M. Straka lgt. & det. (MSHC). Brumov-Bylnice, Hložecký potok stream (13), 8.x.2008, 1 ♀, M. Straka lgt. & det. (NC). Valašské Klobouky, Bílé potoky NR (14), 4.vii.2006, 1 spec., J. Bojková lgt., M. Straka det. (MSHC). Záhorovice, Kladenska stream (17), 8.v.2010, 9 spec., M. Straka lgt. & det. (MSHC). Bojkovice, Koménka stream (20), 8.v.2010, 1 ♂ 1 ♀, M. Straka lgt. & det. (MSHC). Hostětín, Kolelač stream (22), 8.x.2008, 2 spec., P. Komzák lgt. & det. (NC). Rokytnice, right tributary of Rokytenska stream (25), 4.ix.2010, 10 spec., M. Straka lgt. & det. (MSHC). Štítná nad Vláří, Zelenský potok stream (27), 4.ix.2010, 1 spec., M. Straka lgt. & det. (MSHC). Pitín, Olšava stream (28), 8.v.2010, 7 spec., M. Straka lgt. & det. (MSHC). Svatý Štěpán, Bukový potok stream (30), 24.iv.2006, 1 spec., M. Straka lgt. & det. (MSHC). Horní Němčí, Kazivec stream (35), 24.iv.2006, 1 spec., M. Straka lgt. & det. (MSHC). Horní Němčí, Okluky stream (37), 24.iv.2006, 7 spec., M. Straka lgt. & det. (MSHC). Suchov, Suchovské Mlýny, right tributary of Kazivec stream (38), 3 spec., L. Mencl lgt., D. Boukal det. (DBCB, LMTC). Korytná, Lubná pond (39), 5.vii.2001, 1 ♂ 2 ♀♀, P. Kment & M. Horský lgt., D. Boukal det. (NMPC). Komňa, Koménka stream (41), 15.v.2010, 2 spec., M. Straka lgt. & det. (MSHC). Lopeník, Nivnička stream (43), 15.v.2010, 11 spec., M. Straka lgt. & det. (MSHC). Korytná, Lubná stream (44), 15.v.2010, 6 spec., M. Straka lgt. & det. (MSHC). Strání, Klanečnice stream (47), 24.iv.2006, 2 spec., M. Straka lgt. & det. (MSHC). Žitková, Hutě NR (51), 3.vii.2006, 2 spec., M. Straka lgt. & det. (MSHC). Sudoměřice, Sudoměřický potok stream (59), 25.viii.2009, 1 ♂ 1 ♀, M. Straka lgt. & det. (MSHC). Strážnice, Radějovka stream (60), 4.vi.2009, 16 spec., M. Straka lgt. & det. (MSHC). Radějov, Mandát stream (61), 25.ix.2010, 13 spec., M. Straka lgt. & det. (MSHC). Tvarožná Lhota, Járkovec stream (64), 25.ix.2010, 24 spec., M. Straka lgt. & det. (MSHC). Hroznová Lhota, Velička stream (65), 25.ix.2010, 1 spec., M. Straka lgt. & det. (MSHC). Lipov, Kuželovský potok stream (66), 25.ix.2010, 1 spec., M. Straka lgt. & det. (MSHC). Javorník, Hrubý potok stream (70), 3.x.1996, 1 ♂ 1 ♀, L. Mencl lgt., D. Boukal det. (LMTC). Suchov, Kazivec stream (73), 3.iv.2007, 1 ♂ 1 ♀, M. Straka lgt. & det. (NC). Javorník, Velička stream near Petruchovy Mlýny (77), 25.ix.2010, 61 spec., M. Straka lgt. & det. (MSHC). Nová Lhota-Vápenky, Velička stream (78), 25.ix.2007, 2 ♂♂, M. Straka lgt. & det. (MSHC). Javorník, Machová NR (79), 14.v.1998, 1 ♀, I. Malenovský lgt., D. Boukal det. (NMPC). Javorník, Hrubý potok stream (80), 7.ix.2009, 6 spec., P. Komzák lgt. & det. (NC). Javorník, Teplica stream (81), 19.ix.2006, 8 spec., P. Komzák lgt. & det. (1 ♂ in PKBC). Strání-Květná, Svinárský potok stream (84), 15.v.2010, 6 spec., M. Straka lgt. & det. (MSHC).

Distribution and frequency in the Bílé Karpaty PLA: Very common throughout the area. **General distribution:** Western and central Europe. **Habitat preferences:** Rhitral, with preference for smaller streams. **Red List status:** –.

Hydraena pulchella* Germar, 1824*(EN)**

Material examined. Vrbětice, Václavský potok stream (8), 8.v.2010, 5 spec., M. Straka lgt. & det. (MSHC). Záhorovice, Kladenska stream (17), 8.v.2010, 14 spec., M. Straka lgt. & det. (MSHC). Tvarožná Lhota, Járkovec stream (64), 25.ix.2010, 1 spec., M. Straka lgt. & det. (MSHC). Javorník, Velička stream near Petruchovy Mlýny (77), 25.ix.2010, 1 spec., M. Straka lgt. & det. (MSHC).

Distribution and frequency in the Bílé Karpaty PLA: Rare, with localities scattered throughout the area. **General distribution:** European. **Habitat preferences:** Rhitral, xylobiont, preferring warmer streams. **Red List status:** EN.

Comments. A rare species in the Czech Republic, previously with four known post-1960 localities in Bohemia and one in Moravia (BOUKAL *et al.* 2007).

Hydraena pygmaea Waterhouse, 1833

Material examined. Komňa, Koménka stream (41), 15.v.2010, 2 spec., M. Straka lgt. & det. (MSHC). Lopeník, stream under Mechnáč (49), 30.viii.2006, 1 ♀, M. Straka lgt. & det. (MSHC). Starý Hrozenkov, Drietomice stream (54), 6.v.2009, 8 spec., P. Komzák lgt. & det. (PKBC). Javorník, Velička stream near Petruchovy Mlýny (77), 25.ix.2010, 10 spec., M. Straka lgt. & det. (MSHC). Strání-Květná, Svinárský potok stream (84), 15.v.2010, 6 spec., M. Straka lgt. & det. (MSHC). Strání, Javorina NNR, Svinárský potok stream (86), 4.vii.2001, 4 spec., P. Kment & M. Horský lgt., D. Boukal det. (NMPC).

Distribution and frequency in the Bílé Karpaty PLA: Not very common. All known sites are in the central part of the area. **General distribution:** European. **Habitat preferences:** Rhitral, xylobiont. Mostly in colder streams than *H. pulchella*. **Red List status:** –.

Hydraena riparia Kugellan, 1794

Published records. TRÁVNÍČEK (2010): Vrbětice (24); Suchov, Kazivec stream (74).

Additional material examined. Slavičín, Lukšinka stream (5), 4.ix.2010, 1 ♂ 1 ♀, M. Straka lgt. & det. (MSHC). Vlachovice, Sviborka stream (6), 4.ix.2010, 1 ♂ 2 ♀♀, M. Straka lgt. & det. (MSHC). Záhorovice, Kladenka stream (17), 8.v.2010, 1 spec., M. Straka lgt. & det. (MSHC). Petrov, Radějovka stream (57), 9.x.2008, 2 spec., P. Komzák lgt. & det. (NC). Sudoměřice, Sudoměřický potok stream (59), 25.viii.2009, 2 ♂♂ 1 ♀, M. Straka lgt. & det. (MSHC). Strážnice, Radějovka stream (60), 4.vi.2009, 1 ♂ 1 ♀, M. Straka lgt. & det. (MSHC). Radějov, Mandát stream (61), 25.ix.2010, 4 spec., M. Straka lgt. & det. (MSHC). Tvarožná Lhota, Járkovec stream (64), 25.ix.2010, 2 spec., M. Straka lgt. & det. (MSHC). Lipov, Kuželovský potok stream (66), 25.ix.2010, 12 spec., M. Straka lgt. & det. (MSHC). Javorník, Velička stream near Petruchovy Mlýny (77), 25.ix.2010, 2 spec., M. Straka lgt. & det. (MSHC). Nová Lhota-Vápenky, Velička stream (78), 25.ix.2007, 1 ♂, M. Straka lgt. & det. (MSHC). Javorník, Teplíka stream (81), 19.ix.2006, 1 ♂, P. Komzák lgt. & det. (PKBC).

Distribution and frequency in the Bílé Karpaty PLA: Common; most of the localities are in the southern part of the area. **General distribution:** Palaearctic. **Habitat preferences:** Mostly along shores of running water, only rarely in standing water bodies. **Red List status:** –.

Hydraena rufipes Curtis, 1830

(Fig. 2)

Published records. STRAKA (2010): Petrov, Radějovka stream (57); Sudoměřice, Sudoměřický potok stream (59); Strážnice, Radějovka stream (60).

Additional material examined. Tvarožná Lhota, Járkovec stream (64), 25.ix.2010, 1 ♂, M. Straka lgt. & det. (MSHC).

Distribution and frequency in the Bílé Karpaty PLA: So far found in three streams in a small area in the south-western part of the area. **General distribution:** Western and central Europe. **Habitat preferences:** Rhitral. **Red List status:** DD.

Comments. A western European species, known from Ireland, Great Britain, France, Belgium and Germany (JÄCH 2004), with additional unconfirmed records from

Luxembourg, Italy and Poland (GALEWSKI 1990, HANSEN 1998). The nearest recently confirmed occurrence is an isolated population in the Bavarian Alps in Germany (GERSTMEIER 1993); Thuringian populations (HORION 1949) may be extinct. STRAKA (2010) reported *H. rufipes* for the first time from the Czech Republic. The three localities in the Bílé Karpaty Mts. are the only known from the Czech Republic and represent the easternmost populations of *H. rufipes*.

Hydraena saga Orchymont, 1930

Published records. TRÁVNÍČEK (2010): Vrbětice (24); Horní Němčí, Kazivec stream (35); Suchov, Kazivec stream (36, 74). KŘOUPALOVÁ *et al.* (2011): Valašské Klobouky, Bílé potoky NR (14).

Additional material examined. Petrůvka, Petrůvka stream (3), 25.iv.2006, 1 spec., M. Straka lgt. & det. (MSHC). Brumov-Bylnice, Hložecký potok stream (13), 25.iv.2006, 2 spec., M. Straka lgt. & det. (MSHC). Valašské Klobouky, Bílé potoky NR (14), 6.v.2009, 1 spec., J. Bojková lgt., M. Straka det. (MSHC). Návojná, Návojná stream (16), 25.iv.2006, 9 spec., M. Straka lgt. & det. (MSHC). Rokytnice, right tributary of Rokytenka stream (25), 4.ix.2010, 3 spec., M. Straka lgt. & det. (MSHC). Pitín, Olšava stream (29), 12.iv.2008, 1 spec., M. Straka lgt. & det. (NC). Svatý Štěpán, Bukový potok stream (30), 8.x.2008, 8 spec., M. Straka lgt. & det. (NC). Korytná, Březí (34), 4.vii.2001, 2 ♀♀, P. Kment & I. Malenovský lgt., D. Boukal det. (NMPC). Horní Němčí, Kazivec stream (35), 8.x.2008, 1 spec., M. Straka lgt. & det. (NC). Horní Němčí, Okluky stream (37), 24.iv.2006, 6 spec., M. Straka lgt. & det. (MSHC). Komňa, Koménka stream (41), 15.v.2010, 4 spec., M. Straka lgt. & det. (MSHC). Lopeník, Nivnička stream (43), 15.v.2010, 23 spec., M. Straka lgt. & det. (MSHC). Březová, Hradecký járek stream (46), 15.v.2010, 3 spec., M. Straka lgt. & det. (MSHC). Lopeník, stream under Mechnáč (49), 30.viii.2006, 2 ♂♂, M. Straka lgt. & det. (MSHC). Žitková, Vlčí potok stream (50), 15.v.2010, 2 spec., M. Straka lgt. & det. (MSHC). Nová Lhota-Vápenky, Velička stream (78), 3.iv.2007, 1 spec., M. Straka lgt. & det. (NC). Javorník, Hrubý potok stream (80), 7.x.2009, 2 spec., P. Komzák lgt. & det. (NC). Strání-Květná, Svinárský potok stream (84), 15.v.2010, 7 spec., M. Straka lgt. & det. (MSHC). Nová Lhota-Vápenky, Javorina NNR – Velička springs (87), 5.v.2006, 1 ♂ 1 ♀, P. Komzák lgt. & det. (PKBC). Strání-Květná, right tributary of Klanečnice stream (89), 28.v.2005, 1 ♂, D. Trávníček lgt. & det. (MJMZ).

Distribution and frequency in the Bílé Karpaty PLA: It inhabits relatively cold streams throughout the area except its south-western part. **General distribution:** Central and southern Europe. **Habitat preferences:** Rhitral. **Red List status:** –.

Hydraena schuleri Ganglbauer, 1901 (NT)

Material examined. Tvarožná Lhota, Járkovec stream (64), 25.ix.2010, 1 spec., M. Straka lgt. & det. (MSHC). Javorník, Velička stream near Petruchovy Mlýny (77), 25.ix.2010, 1 spec., M. Straka lgt. & det. (MSHC). Strání-Květná, Klanečnice stream (85), 24.iv.2006, 3 spec., M. Straka lgt. & det. (MSHC).

Distribution and frequency in the Bílé Karpaty PLA: Rare, found only at three localities in the southern half of the area. **General distribution:** Central and southern Europe. **Habitat preferences:** Rhitral, with preference for smaller streams. **Red List status:** NT.

Comments. In the Czech Republic, *H. schuleri* is currently restricted to mountains and highlands in Moravia, where it lives in small streams in gravel and debris, sometimes on exposed rootlets (BOUKAL *et al.* 2007).

***Limnebius papposus* Mulsant, 1844**

Published records. TRÁVNÍČEK (2010): Nezdenice (19); Slavičín (21); Vrbětice (23); Sudoměřice, Sudoměřický potok stream valley (58); Radějov, Kútky NR (67); Strání, Mechnáčky NM (82, 83).

Additional material examined. Radějov, Mlýnky (62), 25.viii.1999, 1 spec., M. Fikáček lgt., D. Boukal det. (NMPC).

Distribution and frequency in the Bílé Karpaty PLA: Distributed throughout the area in suitable habitats (small, warm standing water bodies). **General distribution:** European. **Habitat preferences:** Detritophilous, semiaquatic. **Red List status:** –.

***Limnebius truncatellus* (Thunberg, 1794)**

Published records. TRÁVNÍČEK (2010): Slavičín (21); Vrbětice (23); Žitková, Pod Žitkovským vrchem NR (52); Velká nad Veličkou, Zahrady pod Hájem NNR (72); Strání, Mechnáčky NM (82).

Additional material examined. Slavičín, Lukšinka stream (5), 4.ix.2010, 1 spec., M. Straka lgt. & det. (MSHC). Vlachovice, Sviborka stream (6), 4.ix.2010, 1 ♂ 1 ♀, M. Straka lgt. & det. (MSHC). Horní Němčí, Okluky stream (37), 4.x.2006, 1 ♂, M. Straka lgt. & det. (MSHC). Lopeník, stream under Mechnáč (49), 30.viii.2006, 1 ♂ 1 ♀, M. Straka lgt. & det. (MSHC). Tvarožná Lhota, Járkovec stream (64), 25.ix.2010, 1 spec, M. Straka lgt. & det. (MSHC). Lipov, Kuželovský potok stream (66), 25.ix.2010, 3 spec., M. Straka lgt. & det. (MSHC).

Distribution and frequency in the Bílé Karpaty PLA: Uncommon but found throughout the area. **General distribution:** European. **Habitat preferences:** Rhitral. **Red List status:** –.

***Ochthebius colveranus* Ferro, 1979**

(Fig. 3)

Material examined. Hroznová Lhota, Velička stream (65), 25.ix.2010, 1 ♂, M. Straka lgt. & det., D. Boukal revid. (MSHC).

Distribution and frequency in the Bílé Karpaty PLA: Found only at one site in the Velička stream. **General distribution:** Ponto-Pannonian. **Habitat preferences:** Rhitral. **Red List status:** DD.

Comments. The species is known to be distributed from Austria and north-eastern Italy to eastern Turkey and the Caucasus (JÄCH 1991). The previous entry of *O. colveranus* from the Czech Republic in the Palaearctic catalogue (JÄCH 2004) was based on a misunderstanding (see BOUKAL *et al.* 2007). The present record from the Bílé Karpaty PLA is the first finding of *O. colveranus* in the Czech Republic.

All stages of *O. colveranus* inhabit the spray zone of large, sunlit stones and rocks that project from relatively strong current and are covered with algae (JÄCH *et al.* 2005b). The ecology of *O. colveranus* (under the name of *O. exculptus*) was thoroughly studied by BEIER & POMEISL (1959). The only specimen reported here was caught in wet moss just above the water line. The reach of the Velička stream in which the species was recorded is highly morphologically degraded and seems to receive a high load of nutrients from a nearby village. It is possible that the source population lies upstream from this locality but no detailed survey was made to confirm this hypothesis.

***Ochthebius metallescens* Rosenhauer, 1847 (EN)**

Material examined. Javorník, Velička stream near Petruchovy Mlýny (77), 25.ix.2010, 2 spec., M. Straka lgt. & det. (MSHC).

Distribution and frequency in the Bílé Karpaty PLA: Found only at one site in the Velička stream. **General distribution:** European. **Habitat preferences:** Rhitral. **Red List status:** EN.

Comments. In the Czech Republic, *O. metallescens* has recently been known only from two localities in Bohemia (BOUKAL *et al.* 2007, BENEDIKT *et al.* 2011). This record confirms its recent occurrence in Moravia. It lives in flowing waters where it inhabits a zone along the water line with aquatic mosses and algae. Also the specimens here reported were collected in aquatic moss near water surface.

***Ochthebius minimus* (Fabricius, 1792)**

Published records. TRÁVNÍČEK (2010): Slavičín (21); Komňa, Lom Rasová NM (42).

Additional material examined. Komňa, Bučník quarry (40), 16.v.2007, 1 ♂, D. Trávníček lgt. & det. (MJMZ).

Distribution and frequency in the Bílé Karpaty PLA: Recorded only at three sites. **General distribution:** European. **Habitat preferences:** Detritophilous, semiaquatic. **Red List status:** –.

Comments. As the species is quite common in small standing water bodies across the Czech Republic, the small number of records in the Bílé Karpaty PLA is probably due to insufficient sampling effort in standing waters.

Family ELMIDAE

***Elmis aenea* (Ph. Müller, 1806)**

Material examined. Brumov-Bylnice, Hložecký potok stream (13), 25.iv.2006, 1 spec., M. Straka lgt. & det. (MSHC). Žitková, Vlčí potok stream (50), 15.v.2010, 2 spec., M. Straka lgt. & det. (MSHC). Suchov, Kazivec stream (73), 3.iv.2007, 1 ♀, M. Straka lgt. & det. (NC). Nová Lhota-Vápenky, Velička stream (78), 25.ix.2007, 1 spec., M. Straka lgt. & det. (MSHC).

Distribution and frequency in the Bílé Karpaty PLA: Rare and, as elsewhere in central Europe, restricted to cold streams. **General distribution:** European. **Habitat preferences:** Rhitral. **Red List status:** –.

Comments. JURAJDA *et al.* (2000) mentioned this species from the Drietomica stream basin. Unfortunately no voucher specimen is available from this study and misidentification is very likely (probably confusion with *Elmis maugetii*) and we do not accept this data in our study.

***Elmis latreillei* Bedel, 1878**

Material examined. Strání, Javorina NNR, Svinárský potok stream (86), 4.vii.2001, 6 spec., P. Kment & M. Horský lgt., D. Boukal det. (NMPC, DBCB). Nová Lhota-Vápenky, Javorina NNR – Velička springs (87),

5.v.2006, 4 spec., P. Komzák lgt., M. Straka det. (PKBC). Nová Lhota-Vápenky, Velička stream (88), 10.vi.2000, 2 ♂♂ 1 ♀, M. Horsák lgt., D. Boukal det. (MHBC).

Distribution and frequency in the Bílé Karpaty PLA: Found only in the environs of Mt. Velká Javořina in cold streams above 800 m a.s.l. **General distribution:** Central European. **Habitat preferences:** Rhitral, crenophilous. **Red List status:** –.

Elmis maugetii Latreille, 1798

Published records. TRÁVNÍČEK (2010): Vrbětice (24); Horní Němčí, Kazivec stream (35); Suchov, Kazivec stream (36, 74); Radějov, Kútky NR (69).

Additional material examined. Petrůvka, Petrůvka stream (3), 25.iv.2006, 6 spec., M. Straka lgt. & det. (MSHC). Slavičín, Lukšinka stream (5), 4.ix.2010, 15 spec., M. Straka lgt. & det. (MSHC). Vlachovice, Sviborka stream (6), 4.ix.2010, 14 spec., M. Straka lgt. & det. (MSHC). Vrbětice, Václavský potok stream (8), 8.v.2010, 8 spec., M. Straka lgt. & det. (MSHC). Brumov-Bylnice, Brumovka stream (12), 11.iv.2008, 1 spec., P. Komzák lgt. & det. (NC). Brumov-Bylnice, Hložecký potok stream (13), 25.iv.2006, 13 spec., M. Straka lgt. & det. (MSHC). Návojná, Návojná stream (16), 25.iv.2006, 6 spec., M. Straka lgt. & det. (MSHC). Záhorovice, Kladenka stream (17), 8.v.2010, 6 spec., M. Straka lgt. & det. (MSHC). Bojkovice, Koménka stream (18), 24.ix.2009, 44 spec., P. Komzák lgt. & det. (NC). Bojkovice, Koménka stream (20), 8.v.2010, 7 spec. M. Straka lgt. & det. (MSHC). Hostětín, Kolelač stream (22), 8.x.2008, 18 spec., P. Komzák lgt. & det. (NC). Rokytnice, right tributary of Rokytenka stream (25), 4.ix.2010, 13 spec., M. Straka lgt. & det. (MSHC). Popov, Zelenský potok stream (26), 5.v.2009, 66 spec., S. Větríček lgt. & det. (NC). Štítná nad Vláří, Zelenský potok stream (27), 4.ix.2010, 5 spec., M. Straka lgt. & det. (MSHC). Pitín, Olšava stream (28), 8.v.2010, 10 spec., M. Straka lgt. & det. (MSHC). Pitín, Olšava stream (29), 12.iv.2008, 1 spec., M. Straka lgt. & det. (NC). Sidonie, Vlára stream (31), 24.ix.2009, 11 spec., P. Komzák lgt. & det. (NC). Sidonie, Vlárka stream (32), 24.ix.2009, 76 spec., S. Větríček lgt. & det. (NC). Svatý Štěpán, Vlára stream (33), 1.x.2007, 1 spec., M. Straka lgt. & det. (NC). Horní Němčí, Kazivec stream (35), 24.iv.2006, 7 spec., M. Straka lgt. & det. (MSHC). Horní Němčí, Okluky stream (37), 24.iv.2006, 22 spec., M. Straka lgt. & det. (MSHC). Komňa, Koménka stream (41), 15.v.2010, 14 spec., M. Straka lgt. & det. (MSHC). Lopeník, Nivnička stream (43), 15.v.2010, 17 spec., M. Straka lgt. & det. (MSHC). Korytná, Lubná stream (44), 15.v.2010, 16 spec., M. Straka lgt. & det. (MSHC). Březová, Hradecký járek stream (46), 15.v.2010, 6 spec., M. Straka lgt. & det. (MSHC). Strání, Klanečnice stream (47), 24.iv.2006, 18 spec., M. Straka lgt. & det. (MSHC). Starý Hrozenkov, Krátkovský potok stream (53), 5.x.2009, 64 spec., P. Komzák lgt. & det. (NC). Starý Hrozenkov, Drietomice stream (54), 3.v.2005, 1 spec., P. Pařil lgt., D. Boukal det. (DBC); 6.v.2009, 18 spec., P. Komzák lgt. & det. (NC). Žitková, Žitkovský potok stream (55), 5.x.2009, 160 spec., P. Komzák lgt. & det. (NC). Starý Hrozenkov, right tributary of Drietomice stream (56), 24.iv.2006, 2 spec., M. Straka lgt. & det. (MSHC). Petrov, Radějovka stream (57), 9.x.2008, 106 spec., P. Komzák lgt. & det. (NC). Sudoměřice, Sudoměřický potok stream (59), 5.v.2009, 25 spec., S. Větríček lgt. & det. (NC); 25.viii.2009, 13 spec., M. Straka lgt. & det. (MSHC). Strážnice, Radějovka stream (60), 4.vi.2009, 30 spec., M. Straka lgt. & det. (MSHC). Radějov, Mandát stream (61), 25.ix.2010, 12 spec., M. Straka lgt. & det. (MSHC). Radějov, Sudoměřický potok stream (63), 30.iv.2007, 2 spec., M. Straka lgt. & det. (NC). Tvarožná Lhota, Járkovec stream (64), 30.vi.2007, 11 spec., J. Kadlec lgt., D. Boukal det. (JKVC), 25.ix.2010, 19 spec., M. Straka lgt. & det. (MSHC). Hroznová Lhota, Velička stream (65), 25.ix.2010, 8 spec., M. Straka lgt. & det. (MSHC). Lipov, Kuželovský potok stream (66), 25.ix.2010, 2 spec., M. Straka lgt. & det. (MSHC). Javorník, Hrubý potok stream (70), 3.x.1996, 1 ♂, L. Mencl lgt., D. Boukal det. (LMT). Suchov, Kazivec stream (73), 3.iv.2007, 3 spec., M. Straka lgt. & det. (NC). Javorník, Velička stream (76), 18.x.2008, 104 spec., P. Komzák lgt. & det. (NC). Javorník, Velička stream near Petruchovy Mlýny (77), 3.x.1990, 4 ♂♂ 2 ♀♀, L. Mencl lgt., D. Boukal det. (LMT); 25.ix.2010, 45 spec., M. Straka lgt. & det. (MSHC). Nová Lhota-Vápenky, Velička stream (78), 25.ix.2007, 8 spec., M. Straka lgt. & det. (NC). Javorník, Hrubý potok stream (80), 4.v.2009, 2 spec., P. Komzák lgt. & det. (NC). Strání-Květná, Svinárský potok stream (84), 15.v.2010, 3 spec., M. Straka lgt. & det. (MSHC). Strání-Květná, Klanečnice stream (85), 6.x.2009, 2 spec., P. Komzák lgt. & det. (NC). Strání-Květná, right tributary of Klanečnice stream (89), 28.v.2005, 1 ♀, D. Trávníček lgt. & det. (MJMZ).

Distribution and frequency in the Bílé Karpaty PLA: Very common throughout the area. **General distribution:** Western Palaearctic. **Habitat preferences:** Rhitral, usually more downstream than *E. aenea*. **Red List status:** –.

***Elmis obscura* (Ph. Müller, 1806)**

(VU)

Material examined. Sudoměřice, Sudoměřický potok stream (59), 5.v.2009, 2 spec., S. Větríček lgt. & det. (SVBC); 25.viii.2009, 9 spec., M. Straka lgt. & det. (MSHC).

Distribution and frequency in the Bílé Karpaty PLA: Found only in the Sudoměřický potok stream on the south-western edge of the area. **General distribution:** European. **Habitat preferences:** Rhitral, xylobiont. **Red List status:** VU.

Comments. *Elmis obscura* occurs in hyporhithral and epipotamal parts of streams, where it inhabits mostly trailing roots of trees (BOUKAL *et al.* 2007). The specimens reported here were found at flooded roots of ashes (*Fraxinus* sp.).

***Esolus angustatus* (Ph. Müller, 1821)**

Material examined. Brumov-Bylnice, Hložecký potok stream (13), 25.iv.2006, 2 spec., M. Straka lgt. & det. (MSHC). Návojná, Návojná stream (16), 25.iv.2006, 2 spec., M. Straka lgt. & det. (MSHC). Horní Němčí, Okluky stream (37), 24.iv.2006, 11 spec., M. Straka lgt. & det. (NC). Strání, Klanečnice stream (47), 24.iv.2006, 8 spec., M. Straka lgt. & det. (MSHC). Starý Hrozenkov, Drietomice stream (54), 6.v.2009, 2 spec., P. Komzák lgt. & det. (NC). Žitková, Žitkovský potok stream (55), 5.x.2009, 4 spec., P. Komzák lgt. & det. (NC). Tvarožná Lhota, Járkovec stream (64), 30.vi.2007, 1 spec., J. Kadlec lgt., D. Boukal det. (JKVC); 25.ix.2010, 2 spec., M. Straka lgt. & det. (MSHC). Javorník, Hrubý potok stream (70), 3.vii.1996, 1 spec., L. Mencl lgt., D. Boukal det. (LMTC). Suchov, Kazivec stream (73), 25.ix.2007, 1 spec., M. Straka lgt. & det. (NC). Javorník, Hrubý potok stream (80), 4.v.2009, 2 spec., P. Komzák lgt. & det. (NC). Strání-Květná, Svinárský potok stream (84), 15.v.2010, 3 spec., M. Straka lgt. & det. (MSHC). Strání-Květná, Klanečnice stream (85), 6.x.2009, 2 spec., P. Komzák lgt. & det. (NC). Nová Lhota-Vápenky, Velička stream (88), 10.vi.2000, 3 spec., M. Horsák lgt., D. Boukal det. (MHBC). Strání-Květná, right tributary of Klanečnice stream (89), 28.v.2005, 1 ♀, D. Trávníček lgt. & det. (MJMZ).

Distribution and frequency in the Bílé Karpaty PLA: Not rare, with most records from the broader environs of Mt. Velká Javořina. **General distribution:** Continental Europe, Turkey and Armenia. **Habitat preferences:** Rhitral, typically in colder streams. **Red List status:** –.

***Esolus parallelepipedus* (Ph. Müller, 1806)**

Material examined. Petrůvka, Petrůvka stream (3), 25.iv.2006, 1 spec., M. Straka lgt. & det. (MSHC). Sidonie, Vlárka stream (32), 24.ix.2009, 4 spec., S. Větríček lgt. & det. (NC). Starý Hrozenkov, Krátkovský potok stream (53), 5.x.2009, 2 spec., P. Komzák lgt. & det. (NC). Sudoměřice, Sudoměřický potok stream (59), 5.v.2009, 14 spec., S. Větríček lgt. & det. (NC); 25.viii.2009, 1 ♂, M. Straka lgt. & det. (MSHC). Radějov, Mandát stream (61), 25.ix.2010, 1 spec., M. Straka lgt. & det. (MSHC). Suchov, Kazivec stream (73), 3.iv.2007, 1 spec., M. Straka lgt. & det. (NC). Javorník, Velička stream (76), 18.x.2008, 4 spec., P. Komzák lgt. & det. (NC). Javorník, Velička stream near Petruchovy Mlýny (77), 25.ix.2010, 1 spec., M. Straka lgt. & det. (MSHC).

Distribution and frequency in the Bílé Karpaty PLA: Not very common but found throughout the area. **General distribution:** Western Palaearctic. **Habitat preferences:** Rhitral. **Red List status:** –.

***Limnius perrisi* (Dufour, 1834)**

Material examined. Petrůvka, Petrůvka stream (3), 25.iv.2006, 2 spec., M. Straka lgt. & det. (NC). Brumov-Bylnice, Hložecký potok stream (13), 25.iv.2006, 5 spec., M. Straka lgt. & det. (NC). Valašské Klobouky, nameless stream 600 m NW from Vrchy hill (15), 10.vi.1997, 2 ♂♂ 1 ♀, D. Trávníček lgt. & det. (MJMZ). Návojná, Návojná stream (16), 25.iv.2006, 16 spec., M. Straka lgt. & det. (MSHC). Sidonie, Vlárka stream (32), 6.v.2009, 4 larvae, S. Větríček lgt. & det. (NC). Starý Hrozenkov, Krátkovský potok stream (53), 5.x.2009, 2 spec., P. Komzák lgt. & det. (NC). Starý Hrozenkov, Drietomice stream (54), 3.v.2005, 2 spec., P. Pařil lgt., D. Boukal det. (DBCB); 6.v.2009, 2 spec., P. Komzák lgt. & det. (NC). Starý Hrozenkov, right tributary of Drietomice stream (56), 24.iv.2006, 3 spec., M. Straka lgt. & det. (MSHC). Nová Lhota-Vápenky, Velička stream (78), 3.iv.2007, 3 spec., M. Straka lgt. & det. (NC). Strání-Květná, Svinárský potok stream (84), 15.v.2010, 1 spec., M. Straka lgt. & det. (MSHC). Strání-Květná, Klanečnice stream (85), 5.v.2009, 1 spec., P. Komzák lgt. & det. (NC). Strání, Javorina NNR, Svinárský potok stream (86), 4.vii.2001, 2 spec., P. Kment & M. Horský lgt., D. Boukal det. (NMPC). Strání-Květná, right tributary of Klanečnice stream (89), 28.v.2005, 1 ♂ 1 ♀, D. Trávníček lgt. & det. (MJMZ).

Distribution and frequency in the Bílé Karpaty PLA: Not very common, found in cold streams. **General distribution:** European. **Habitat preferences:** Rhitral. **Red List status:** —.

***Limnius volckmari* (Panzer, 1793)**

Material examined. Petrůvka, Petrůvka stream (3), 25.iv.2006, 4 spec., M. Straka lgt. & det. (MSHC). Slavičín, Lukšinka stream (5), 4.ix.2010, 1 spec., M. Straka lgt. & det. (MSHC). Vlachovice, Sviborka stream (6), 4.ix.2010, 1 spec., M. Straka lgt. & det. (MSHC). Vrbětice, Václavský potok stream (8), 8.v.2010, 1 spec., M. Straka lgt. & det. (MSHC). Poteč (10), 21.v.1999, 1 spec., M. Horský lgt., D. Boukal det. (MHBC). Brumov-Bylnice, Hložecký potok stream (13), 25.iv.2006, 11 spec., M. Straka lgt. & det. (MSHC). Návojná, Návojná stream (16), 25.iv.2006, 6 spec., M. Straka lgt. & det. (MSHC). Bojkovice, Koménka stream (18), 24.ix.2009, 4 spec., P. Komzák lgt. & det. (NC). Hostětín, Kolelač stream (22), 10.iv.2008, 2 spec., P. Komzák lgt. & det. (NC). Rokytnice, right tributary of Rokytenka stream (25), 4.ix.2010, 2 spec., M. Straka lgt. & det. (MSHC). Popov, Zelenský potok stream (26), 5.v.2009, 3 spec., S. Větríček lgt. & det. (NC). Štítná nad Vláři, Zelenský potok stream (27), 4.ix.2010, 4 spec., M. Straka lgt. & det. (MSHC). Pitín, Olšava stream (28), 8.v.2010, 1 spec., M. Straka lgt. & det. (MSHC). Pitín, Olšava stream (29), 12.iv.2008, 1 spec., M. Straka lgt. & det. (NC). Svatý Štěpán, Bukový potok stream (30), 24.iv.2006, 1 spec., M. Straka lgt. & det. (NC). Sidonie, Vlára stream (31), 24.ix.2009, 3 larvae, P. Komzák lgt. & det. (NC). Sidonie, Vlárka stream (32), 24.ix.2009, 41 spec., S. Větríček lgt. & det. (NC). Horní Němčí, Okluky stream (37), 24.iv.2006, 2 spec., M. Straka lgt. & det. (NC). Komňa, Koménka stream (41), 15.v.2010, 5 spec., M. Straka lgt. & det. (MSHC). Lopeník, Nivnička stream (43), 15.v.2010, 1 spec., M. Straka lgt. & det. (MSHC). Strání, Klanečnice stream (47), 4.x.2006, 2 spec., M. Straka lgt. & det. (MSHC). Žitková, Vlčí potok stream (50), 15.v.2010, 1 spec., M. Straka lgt. & det. (MSHC). Starý Hrozenkov, Krátkovský potok stream (53), 5.x.2009, 14 spec., P. Komzák lgt. & det. (NC). Starý Hrozenkov, Drietomice stream (54), 3.v.2005, 4 spec., P. Pařil lgt., D. Boukal det. (DBCB); 6.v.2009, 10 spec., P. Komzák lgt. & det. (NC). Žitková, Žitkovský potok stream (55), 5.x.2009, 20 spec., P. Komzák lgt. & det. (NC). Starý Hrozenkov, right tributary of Drietomice stream (56), 24.iv.2006, 1 spec., M. Straka lgt. & det. (MSHC). Petrov, Radějovka stream (57), 9.x.2008, 2 spec., P. Komzák lgt. & det. (NC). Sudoměřice, Sudoměřický potok stream (59), 5.v.2009, 4 spec., S. Větríček lgt. & det. (NC). Strážnice, Radějovka stream (60), 4.vi.2009, 1 spec., M. Straka lgt. & det. (MSHC). Radějov, Mandát stream (61), 25.ix.2010, 2 spec., M. Straka lgt. & det. (MSHC). Radějov, Sudoměřický potok stream (63), 30.iv.2007, 2 spec., M. Straka lgt. & det. (NC). Tvarožná Lhota, Járkovec stream (64), 25.ix.2010, 1 spec., M. Straka lgt. & det. (MSHC). Javorník, Hrubý potok stream (70), 3.vii.1996, 8 spec., L. Mencl lgt., D. Boukal det. (LMTC). Suchov, Kazivec stream (73), 3.iv.2007, 2 spec., M. Straka lgt. & det. (NC). Javorník, Velička stream (76), 18.x.2008, 7 spec., P. Komzák lgt. & det. (NC). Javorník, Velička stream near Petruchovy Mlýny (77), 25.ix.2010, 4 spec., M. Straka lgt. & det. (MSHC). Nová Lhota-Vápenky, Velička stream (78), 3.iv.2007, 1 spec., M. Straka lgt. & det. (NC). Javorník, Hrubý potok stream (80), 7.x.2009, 6 spec., P. Komzák lgt. & det. (NC). Javorník, Teplica stream (81),

19.ix.2006, 1 spec., P. Komzák lgt. & det. (NC). Strání-Květná, Svinárský potok stream (84), 15.v.2010, 1 spec., M. Straka lgt. & det. (MSHC). Strání-Květná, Klanečnice stream (85), 6.x.2009, 4 larvae, P. Komzák lgt. & det. (NC); 25.viii.2009, 3 spec., M. Straka lgt. & det. (MSHC).

Distribution and frequency in the Bílé Karpaty PLA: Very common throughout the area. **General distribution:** Western Palaearctic. **Habitat preferences:** Rhitral, usually downstream of *L. perrisi*. **Red List status:** –.

Riolus cupreus (Ph. Müller, 1806)

(VU)

Published records. BOUKAL *et al.* (2007): Suchov, Velička stream (75).

Additional material examined. Vrbětice, Václavský potok stream (8), 8.v.2010, 1 spec., M. Straka lgt. & det. (MSHC). Bojkovice, Koménka stream (18), 24.ix.2009, 2 spec., P. Komzák lgt. & det. (NC). Korytná, Lubná stream (44), 15.v.2010, 9 spec., M. Straka lgt. & det. (MSHC). Starý Hrozenkov, Drietomice stream (54), 6.v.2009, 2 spec., P. Komzák lgt. & det. (NC). Žitková, Žitkovský potok stream (55), 5.x.2009, 16 spec., P. Komzák lgt. & det. (NC). Petrov, Radějovka stream (57), 9.x.2008, 2 ♂♂ 2 ♀♀, P. Komzák lgt. & det. (PKBC). Sudoměřice, Sudoměřický potok stream (59), 25.viii.2009, 2 ♂♂ 1 ♀, M. Straka lgt. & det. (MSHC). Radějov, Mandát stream (61), 25.ix.2010, 3 spec., M. Straka lgt. & det. (MSHC). Tvarožná Lhota, Járkovec stream (64), 25.ix.2010, 1 spec., M. Straka lgt. & det. (MSHC). Hroznová Lhota, Velička stream (65), 25.ix.2010, 4 spec., M. Straka lgt. & det. (MSHC). Javorník, Velička stream (76), 18.x.2008, 4 spec., P. Komzák lgt. & det. (NC). Javorník, Velička stream near Petruchovy Mlýny (77), 25.ix.2010, 28 spec., M. Straka lgt. & det. (MSHC).

Distribution and frequency in the Bílé Karpaty PLA: Not rare; found throughout the area, with most of the records from its southern part. **General distribution:** European. **Habitat preferences:** Rhitral, mostly in calcareous streams. **Red List status:** VU.

Comments. A very rare and local species in the Czech Republic, recently known from a few localities in central Bohemia and southern Moravia (BOUKAL *et al.* 2007). The Bílé Karpaty PLA represents the main area of its occurrence in the Czech Republic.

Riolus subviolaceus (Ph. Müller, 1817)

Published records. TRÁVNÍČEK (2010): Suchov, Kazivec stream (74).

Additional material examined. Petrůvka, Petrůvka stream (3), 5.x.2006, 2 spec., M. Straka lgt. & det. (MSHC). Poteč, left tributary of Brumovka stream (11), 14.v.2006, 2 ♂♂ 2 ♀♀, P. Komzák lgt. & det. (PKBC). Návojná, Návojná stream (16), 25.iv.2006, 1 spec., M. Straka lgt. & det. (MSHC). Bojkovice, Koménka stream (18), 24.ix.2009, 28 spec., P. Komzák lgt. & det. (NC). Bojkovice, Koménka stream (20), 8.v.2010, 1 ♂ 3 ♀♀, M. Straka lgt. & det. (MSHC). Popov, Zelenský potok stream (26), 5.v.2009, 26 spec., S. Větríček lgt. & det. (NC). Štítná nad Vláří, Zelenský potok stream (27), 4.ix.2010, 4 spec., M. Straka lgt. & det. (MSHC). Pitín, Olšava stream (28), 8.v.2010, 4 spec., M. Straka lgt. & det. (MSHC). Svatý Štěpán, Bukový potok stream (30), 24.iv.2006, 1 spec., M. Straka lgt. & det. (MSHC). Sidonie, Vlára stream (31), 6.v.2009, 2 larvae, P. Komzák lgt. & det. (NC). Sidonie, Vlárka stream (32), 24.ix.2009, 34 spec., S. Větríček lgt. & det. (NC). Horní Němčí, Okluky stream (37), 24.iv.2006, 1 spec., M. Straka lgt. & det. (MSHC). Lopeník, Nivnička stream (43), 15.v.2010, 1 spec., M. Straka lgt. & det. (MSHC). Březová, Cestiska NM (45), 28.iv.2007, 1 ♂ 1 ♀, T. Sitek lgt., D. Boukal det. (TSOC). Strání, Klanečnice stream (47), 4.x.2006, 3 spec., M. Straka lgt. & det. (MSHC). Lopeník, Hrubý Mechnáč (48), 25.iv.2000, 2 ♂♂ 2 ♀♀, M. Horsák lgt., D. Boukal det. (MHBC); 3.vii.2006, 5 spec., J. Bojková lgt., M. Straka det. (MSHC). Žitková, Hutě NR (51), 3.vii.2006, 1 spec., M. Straka lgt. & det. (MSHC). Starý Hrozenkov, Krátkovský potok stream (53), 5.x.2009, 18 spec., P. Komzák lgt. & det. (NC). Starý Hrozenkov, Drietomice stream (54), 3.v.2005, 8 spec., P. Pařil lgt., D. Boukal det. (DBC); 6.v.2009, 16 spec., P. Komzák lgt. & det. (NC). Žitková, Žitkovský potok stream (55), 5.x.2009, 8 spec., P. Komzák lgt. & det. (NC). Starý Hrozenkov, right tributary of Drietomice stream (56), 24.iv.2006, 3 spec., M. Straka lgt. & det.

(MSHC). Sudoměřice, Sudoměřický potok stream (59), 5.v.2009, 12 spec., S. Větrčíček lgt. & det. (NC). Javorník, Hrubý potok stream (70), 3.x.1996, 2 ♂♂ 2 ♀♀, L. Mencl lgt., D. Boukal det. (LMTC). Suchov, Kazivec stream (73), 3.iv.2007, 2 spec., M. Straka lgt. & det. (NC). Javorník, Velička stream (76), 18.x.2008, 2 spec., P. Komzák lgt. & det. (NC). Javorník, Velička stream near Petruchovy Mlýny (77), 25.ix.2010, 31 spec., M. Straka lgt. & det. (MSHC). Nová Lhota-Vápenky, Velička stream (78), 3.iv.2007, 2 spec., M. Straka lgt. & det. (MSHC). Javorník, Hrubý potok stream (80), 7.x.2009, 8 spec., P. Komzák lgt. & det. (NC). Strání-Květná, Svinárský potok stream (84), 15.v.2010, 3 spec., M. Straka lgt. & det. (MSHC). Strání-Květná, Klanečnice stream (85), 6.x.2009, 2 spec., P. Komzák lgt. & det. (NC). Nová Lhota-Vápenky, Javorina NNR – Velička springs (87), 14.viii.2009, 2 spec., M. Horsák lgt., D. Boukal det. (MHBC). Strání-Květná, right tributary of Klanečnice stream (89), 28.v.2005, 1 ♂, D. Trávníček lgt. & det. (MJMZ).

Distribution and frequency in the Bílé Karpaty PLA: Common throughout the area. **General distribution:** European. **Habitat preferences:** Rhitral, mostly in calcareous streams. **Red List status:** –.

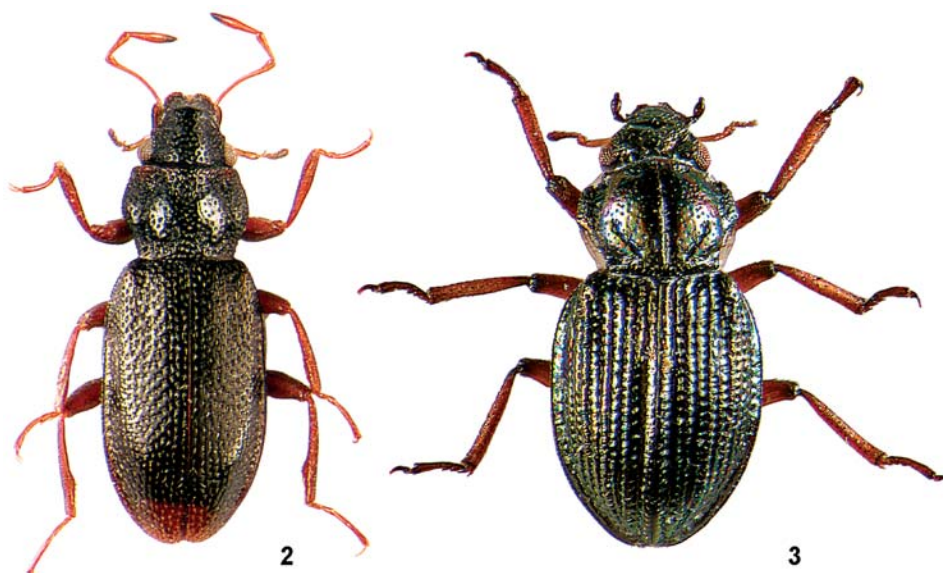
Discussion and conclusions

Before the work described in this paper, the distribution of Hydraenidae and Elmidae in the Bílé Karpaty PLA was virtually unknown. Extensive surveys in 1994–2010 recorded 18 species of the family Hydraenidae and 10 species of the family Elmidae in the area. Most of the localities studied consist of smaller or larger streams, and hence most frequently recorded are common rheophilic species such as *Hydraena gracilis*, *H. nigrita*, *Elmis maugetii* and *Limnius volckmari*. Only a few localities consist of helocrene springs or fens, which harbour specialized oligostenothermic species such as *Hydraena morio* and *Elmis latreillei*. Moreover, only a few sites consist of standing waters. We have thus recorded only a limited number of localities for species that live in standing water and are quite common elsewhere in southern Moravia, such as *Ochthebius minimus* and *Limnebius papposus*.

For the Hydraenidae and Elmidae, the most valuable habitats in the area studied are well-preserved, warm lowland streams. This habitat is highly degraded throughout central Europe, either due to direct changes to stream morphology or to intensive agriculture, which leads to eutrophication and clogging of streambeds. The Bílé Karpaty PLA thus remains a significant refuge for many species with past wider distributions and currently highly fragmented populations, such as *Hydraena belgica*, *H. minutissima*, *H. pulchella*, *Ochthebius metallescens*, *Elmis obscura* and *Riolus cupreus*.

Further, most of the streams in the Bílé Karpaty PLA are highly calcareous. *Riolus cupreus*, which is rare in most other parts of the Czech Republic and is confined to calcareous streams (BOUKAL *et al.* 2007, ELLIOTT 2008), is common in the area. The absence of *Hydraena dentipes*, common in other mountain and hilly areas in the Czech Republic, may be due to its intolerance of calcareous substrate (according to d'Orchymont in HRBÁČEK 1951).

Several remarkable discoveries were made during the surveys. First, a relict population of *Hydraena rufipes* was revealed. This species has a continuous distribution area in western Europe and reaches central Europe in the form of a couple of isolated relict populations. The new population is apparently limited to a very small area in the southern part of the Bílé Karpaty PLA (Sudoměřický potok and Radějovka streams,



Figs 2–3. 2 – *Hydraena rufipes* Curtis: male habitus in dorsal view, body size 2.1 mm; 3 – *Ochthebius colveranus* Ferro: habitus in dorsal view, body size 2.0 mm.

including the Járkovec tributary) and represents the easternmost population of the species. Another surprise was the occurrence of *Ochthebius colveranus*. The Bílé Karpaty Mts. apparently lie at the north-western border of the distribution area of this Ponto-Pannonian species (disregarding a doubtful record from Denmark, see e.g. BOUKAL *et al.* 2007) and the specimen found is the first record of this species in the Czech Republic. Since only one specimen was found, it is clear that more detailed research is needed to evaluate its conservation status. Without any doubt, both *H. rufipes* and *O. colveranus* are very rare in the Czech Republic and may be threatened with extinction.

Three additional species were not included in the list in this paper although they may also belong to the recent fauna of the Bílé Karpaty PLA: *Ochthebius gibbosus* Germar, 1824, *Limnebius crinifer* Rey, 1885 and *Ochthebius crenulatus* Mulsant et Rey, 1850. All of these have been collected either inside or just outside the area in the past. We have seen one specimen of *O. gibbosus* labelled “Valašské Klobouky, Dr. Richter”, probably collected in the 1930’s and deposited in the Museum of South-eastern Moravia in Zlín. This species was also reported by KODADA (1992) for the eastern slopes of the White Carpathian Mts. in Slovakia, and its recent occurrence in the Bílé Karpaty PLA is therefore very likely. One specimen of *L. crinifer* Rey, 1885 labelled as “Luhačovice, vi. 1944, Hájek lgt.” is deposited in the National Museum, Prague. Finally, one specimen of *O. crenulatus* labelled “Valašské Klobouky, Dr. Richter lgt.” is deposited in the Museum

of South-eastern Moravia in Zlín (see also BOUKAL *et al.* 2007). The (recent) occurrence of the latter two species in the Bílé Karpaty PLA needs confirmation.

To sum up, we consider the beetle fauna of flowing waters in the Bílé Karpaty PLA as to be very well-preserved and conclude that the streams are of high conservation value. The area serves as a refuge for many species that are rare and endangered in other parts of the Czech Republic and even in the whole of central Europe. Altogether seven of the recorded species are included in the Red List of threatened species in the Czech Republic. Two species are classified as endangered (*Hydraena pulchella* and *Ochthebius metallescens*), three as vulnerable (*Hydraena morio*, *Elmis obscura* and *Riolus cupreus*) and two as near-threatened (*Hydraena belgica* and *Hydraena schuleri*) (FARKAČ *et al.* 2005, BOUKAL *et al.* 2007).

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Souhrn

Vodanoví a vodnářoví (Coleoptera: Hydraenidae, Elmidae) Chráněné krajinné oblasti a biosférické rezervace Bílé Karpaty.

Při průzkumech v letech 1994–2010 bylo na území CHKO Bílé Karpaty nalezeno celkem 18 druhů čeledi Hydraenidae a 10 druhů čeledi Elmidae. Tři další druhy čeledi Hydraenidae jsou z oblasti známé historicky. Druh *Ochthebius colveranus* byl zaznamenán poprvé na území České republiky. Spolu s nedávno publikovaným objevem populace druhu *Hydraena rufipes* jde o nejvýznamnější nálezy pocházející ze současných průzkumů. Dále se podařilo potvrdit recentní výskyt druhů *Hydraena minutissima* a *Ochthebius metallescens* na Moravě. V práci je uveden úplný výčet dříve publikovaných i nových nálezů ze sledovaného území a u každého druhu je doplněn stručný komentář k jeho biologii a významu pro ochranu přírody. Dva z nalezených druhů jsou v Červeném seznamu ohrožených bezobratlých ČR (FARKAČ *et al.* 2005) klasifikovány jako ohrožené (*Hydraena pulchella* a *Ochthebius metallescens*), tři jako zranitelné (*Hydraena morio*, *Elmis obscura* a *Riolus cupreus*) a dva jako téměř ohrožené (*Hydraena belgica* a *Hydraena schuleri*). Výsledky provedených průzkumů ukázaly faunu tekoucích vod Bílých Karpat jako velice dobře zachovalou s vysokou ochrannou hodnotou. Oblast poskytuje útočiště mnoha druhům, které jsou v ostatních částech České republiky i celé střední Evropy velice vzácné a ohrožené.

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