Silva Gabreta	vol. 16 (1)	p. 27–31	Vimperk, 2010

Notes on soldier beetles (Coleoptera: Cantharidae) of montane forest in southern part of the Bohemian Forest, Czech Republic

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Abstract
The data on 425 specimens of 11 species of soldier beetles (Coleoptera: Cantharidae) from two montane forest stands of the Bohemian Forest are presented. The species spectrum reflects the stands and the altitudes about 1200 m a.s.l.; several montane species were found. The most important are the records of *Podistra prolixa* (Märkel, 1851) and *Malthodes alpicola* Kiesenwetter, 1852. The distribution of both species is discussed.

Key words: Trojmezná, Smrčina, Šumava, *Podistra prolixa*, *Malthodes alpicola*, distribution

Introduction

No paper has focused on soldier beetles fauna of any locality of the Bohemian Forest so far. A certain material from this mountain range is deposited in the collection of the National Museum in Prague and in several private collections, yet these data have not been evaluated. Only several single records were published (e.g., Švihla 1978). This paper brings the first summarised data from the two localities of the Bohemian Forest.

Material and methods

All the material was collected by Roman Modlinger using a Malaise trap situated inside the forest. Beetles were identified by the author (Cantharinae) using Dahlgren (1979) and by Vladimír Švihla (Malthininae), nomenclature follows Kazantsev & Brancucci (2007).

Localities under study

The survey was carried out on two mounts at about 1200 m a.s.l. The exact data are listed as follows: mount name, grid code of the faunistic square (e.g., Pruner & Míka 1996), biotope, year of survey, and altitude.

Smrčina Mt., 7249, *Calamagrostio villosae-Piceetum*, 2007, 1280 m.

Trojmezná Mt., 7248, *Athyrio alpestris-Piceetum*, 2004 (a), 1180 m; 2004 (b), 1230 m; 2006, 1200 m; 2007, 1230 m.

Results and discussion

List of species

The species are listed alphabetically. The data in the list are: locality, trapping period, and number of specimens. The "Trojmezná 2004" is divided into two areas marked by "(a)" or "(b)" added just after the period (see Localities under study for explanation). The distribution and habitat preferences of each species in the Czech Republic are also added.

Cantharis flavilabris Fallén, 1807
Trojmezná, 26 Jun–5 Jul 2006, 1 ex., 1 Jul–20 Sep 2007, 1 ex.
The relatively common species prefers dump habitats, it is usually found on meadows. These records in high altitudes are relatively unusual because of the lower and medium altitudes preferred by *C. flavilabris* (Kuska 1995, Dvořák, unpubl. data).

Cantharis pagana Rosenhauer, 1846
Smrčina, 8 Jun–1 Jul 2007, 4 ex. **Trojmezná**, 13–29 Jul 2004 (b), 1 ex., 26 Jun–5 Jul 2006, 1 ex., 5–13 Jul 2006, 1 ex.
The submontane to montane species is sparsely found on damp habitats, predominantly in forests. Its distribution in the Czech Republic was summarised by Švihla (2006).

Cratosilis denticollis (Schummel, 1844)
Smrčina, 8 Jun–1 Jul 2007, 1 ex. **Trojmezná**, 26 Jun–5 Jul 2006, 1 ex., 13–20 Jul 2006, 1 ex., 20–27 Jul 2006, 1 ex., 27 Jul–16 Aug 2006, 1 ex., 1 Jul–20 Sep 2007, 2 ex.
The typical montane species, occurring mainly above 1000 m a.s.l., is widely distributed, but found only irregularly and in small numbers.

Malthinus biguttatus (Paykull, 1800)
Trojmezná, 13–20 Jul 2006, 1 ex.
Common montane and submontane forest species.

Malthodes alpicola Kiesenwetter, 1852
Trojmezná, 29 Jul–18 Aug 2004 (a), 5 ex., 26 Jun–5 Jul 2006, 1 ex., 13–20 Jul 2006, 14 ex., 1 Jul–20 Sep 2007, 8 ex.
The very rare species of montane forests occurs in the Czech Republic only in summits of the Bohemian Forest. For more detailed comments see a special paragraph below.

Malthodes fuscus (Waltl, 1838)
Trojmezná, 13–20 Jul 2006, 2 ex., 1 Jul–20 Sep 2007, 2 ex.
Common forest species.

Podabrus alpinus (Paykull, 1798)
Trojmezná, 13–29 Jul 2004 (a), 1 ex., 5–13 Jul 2006, 2 ex., 20–27 Jul 2006, 1 ex., 1 Jul–20 Sep 2007, 1 ex.
The boreomontane species occurs mainly in montane forests. Occasionally it could be found in lower and medium altitudes, but always in larger forests of inverse stands. The Trojmezná site represents a typical habitat for this species.

Podistra prolixa (Märkel, 1851)
Smrčina, 8 Jun–1 Jul 2007, 3 ex., 1 Jul–30 Sep 2007, 41 ex. **Trojmezná**, 13–29 Jul 2004 (a), 3 ex., 29 Jul–18 Aug 2004 (a), 5 ex., 5–13 Jul 2006, 9 ex., 20–27 Jul 2006, 1 ex., 7 Jun–1 Jul 2007, 11 ex., 1 Jul–20 Sep 2007, 89 ex.
Very rare species of montane forests. For more detailed comments see a special paragraph below.

Podistra rufotestacea (Letzner, 1844)
Trojmezná, 22 Jun–13 Jul 2004 (b), 1 ex.
The widely distributed montane and submontane species is found usually in small numbers only.

Podistra schoenherri (Dejean, 1837) (=*pilosa* (Paykull, 1798))
Smrčina, 8 Jun–1 Jul 2007, 30 ex., 1 Jul–30 Sep 2007, 67 ex. **Trojmezná**, 13–29 Jul 2004 (a), 5 ex., 22 Jun–13 Jul 2004 (b), 5 ex., 29 Jul–18 Aug 2004 (b), 2 ex., 26 Jun–5 Jul 2006, 8 ex., 13–20 Jul 2006, 53 ex., 20–27 Jul 2006, 22 ex., 7 Jun–1 Jul 2007, 7 ex., 1 Jul–20 Sep 2007, 9 ex.
The common montane species is distributed over the whole Bohemian Forest (Dvořák, unpubl. data).

Rhagonycha nigriceps Waltl, 1838
Trojmezná, 20–27 Jul 2006, 1 ex.
Rare species of montane forests.

General comments

Altogether 425 specimens of 11 species (4 from the Smrčina Mt. in 2007 and 11 from the Trojmezná Mt. in 2004, 2006, and 2007) of soldier beetles were found at the localities under study (see Table 1). Typical montane species are presented at both localities: *C. denticollis*, *M. alpicola*, *P. alpinus*, all *Podistra* species, *R. nigriceps*. The two species, *P. schoenherri* and *P. prolixa*, represent together 87% of all captured specimens (see Table 1). Also *M. alpicola* is present in high numbers at the locality Trojmezná.

The two species, *M. alpicola* and *P. prolixa*, are ranked by Švihla (2005) as endangered species for the fauna of the Czech Republic. For this family, this is the highest category containing the rarest species of the Czech Republic.

Comments on two rare species

Podistra prolixa (Märkel, 1851)

It is the relict European montaneous species of the Alps and the Carpathians. Its known distribution according to Kazantsev & Brancucci (2007) comprises Austria, Czech Republic, France, Italy, Slovakia, Slovenia, and Switzerland. Moreover, Dahlgren (1979) reported this species also from Croatia and Germany. In the last checklist of the Czech Republic,

Table 1. Presence (numbers and percentage) of soldier beetles at different sites during the survey in individual years. Explanations: Sm = Smrčina, Tr = Trojmezná, All = all sites together.

	Sm 2007	Tr 2004	Tr 2006	Tr 2007	Tr 2004–2007	All
C. flavilabris	–	–	1 (0.8%)	1 (0.8)	2 (0.7%)	2 (0.5%)
C. pagana	4 (2.7%)	1 (3.6%)	1 (0.8%)	–	2 (0.7%)	6 (1.4%)
C. denticollis	1 (0.7%)	–	4 (3.3%)	2 (1.5%)	6 (2.2%)	7 (1.6%)
M. biguttatus	–	–	1 (0.8%)	–	1 (0.4%)	1 (0.2%)
M. alpicola	–	5 (17.9%)	15 (12.4%)	8 (6.2%)	28 (10.0%)	28 (6.6%)
M. fuscus	–	–	2 (1.7%)	2 (1.5%)	4 (1.4%)	4 (0.9%)
P. alpinus	–	1 (3.6%)	3 (2.5%)	1 (0.8%)	5 (1.8%)	5 (1.2%)
P. prolixa	44 (30.1%)	8 (28.6%)	10 (8.3%)	100 (76.9%)	118 (42.3%)	162 (38.1%)
P. rufotestacea	–	1 (4.3%)	–	–	1 (0.4%)	1 (0.2%)
P. schoenherri	97 (66.4%)	12 (42.9%)	83 (68.6%)	16 (12.3%)	111 (39.8%)	208 (48.9%)
R. nigriceps	–	–	1 (0.8%)	–	1 (0.4%)	1 (0.2%)
No. of specimens	**146**	**28**	**121**	**130**	**279**	**425**

Švihla (1993) reported *P. prolixa* from both parts of the Czech Republic, Bohemia and Moravia. Kuska (1995) discussed several old records from Poland (the occurrence is not confirmed) and reported three specimens from the Praděd Mt. (Altvater Mt.) from the Hrubý Jeseník Mts., Moravia. Some unpublished data from the East Carpathians are deposited in the National Museum, Prague, Czech Republic (NMPC; Švihla, pers. comm.).

Localities from Bohemia (except of the findings from the Smrčina and Trojmezná mounts):

Špičák, 6845, mixed forest, 28 Jun 1996, 1 ex., L. Dvořák leg., det. et coll., V. Švihla rev. **Přední Mlynářská Slať bog**, 6946, forest and peatbog, 24 Jul 1997, 2 ex., K. Rébl leg. et coll., V. Švihla det. **Zadní Mlynářská Slať bog**, 6946, forest and peatbog, 27 Jul 1997, 1 ex., K. Rébl leg. et coll., V. Švihla det. **Plešné Lake**, 7249, 16 Jul 1969, 1 ex., J. Strejček leg. et det., NMPC coll.

The present distribution of *P. prolixa* in the Czech Republic comprises these localities from the Bohemian Forest and very scarce and old data from northern Moravia only.

Malthodes alpicola **(**Kiesenwetter, 1852)

It is the very rare species from the Alps, with an isolated occurrence in some adjacent regions including the Bohemian Forest. The species is known from Austria, Czech Republic, Germany, Italy, Switzerland (Kazantsev & Brancucci 2007), and Luxemburg (Bretzendorfer 2002). The very interesting find from a lowland habitat (collin stand with oak and hornbeam in northern Bavaria) was published by Müller & Gossner (2010). The only published record from the Czech Republic was based on a single male without precise locality (Švihla 1978).

Other localities from the Czech Republic (except of findings from the Trojmezná Mt.):

Hůrka, 6845-46, forest stands along a patch to Laka Lake, 10 Aug 1996, 1 ex., K. Rébl leg. et coll., V. Švihla det. **Modrava**, 6946, meadows and forest along the Roklanský Potok stream near the Javoří Pila site, 8 Aug 1996,

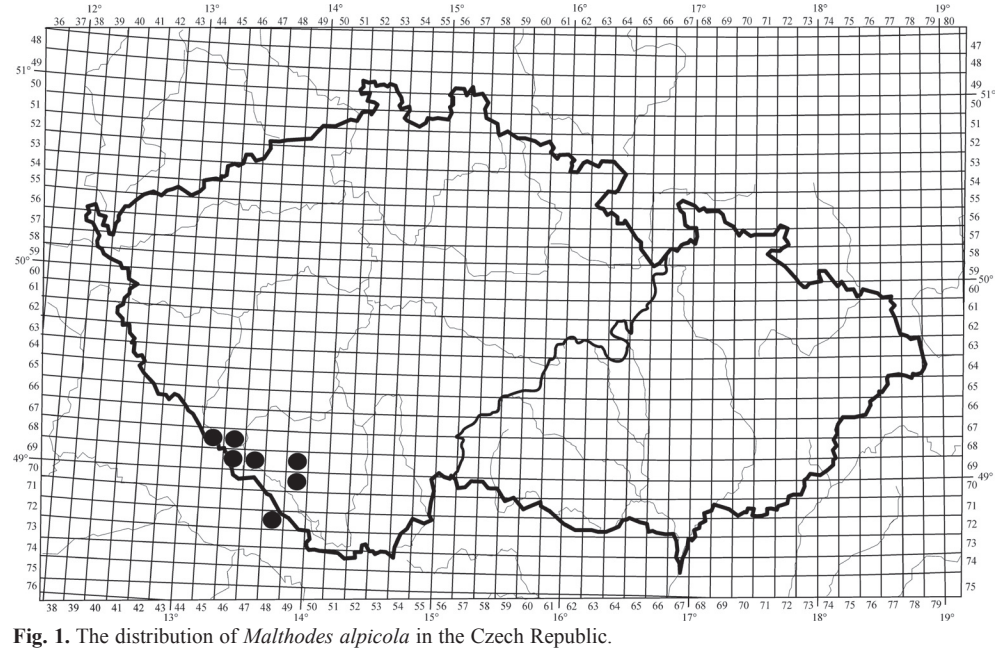

Fig. 1. The distribution of *Malthodes alpicola* in the Czech Republic.

1 ex., K. Rébl leg. et coll., V. Švihla det. **Přední Mlynářská Slať bog**, 6946, forest and peatbog, 24 Jul 1997, 1 ex., K. Rébl leg. et coll., V. Švihla det. **Zadní Mlynářská Slať bog**, 6946, forest and peatbog, 27 Jul 1997, 1 ex., K. Rébl leg. et coll., V. Švihla det. **Horská Kvilda**, 6947, meadows and bushes, 9 Aug 1996, 5 ex., K. Rébl leg., V. Švihla det., K. Rébl et NMPC coll. **Březový Kopec hill** near Řepešín, 6949, 30 Jul 1983, 2 ex., J. Macek leg., V. Švihla det., NMPC coll. **Libín**, 7049, 25–30 Jul 1996, 1 ex., P. Zahradník leg., V. Švihla det., NMPC coll.

The distribution of *M. alpicola* in the Czech Republic is restricted to several localities in the Bohemian Forest only (see Fig. 1).

Conclusions

The soldier beetle fauna of the study area is formed by several very typical montane species and several forest species.

The records of *Podistra prolixa* and *Malthodes alpicola* are very important for improving of our knowledge of this beetle family in Europe because of their rare and restricted occurrence in the regions northward of the Alps.

The soldier beetle fauna of the study area is very unique in the Czech Republic due to the presence of the both above mentioned species. According to present knowledge, similar fauna can be found at other localities of the Bohemian Forest, but nowhere in the other mountain ranges in the Czech Republic.

Acknowledgements. I wish to thank Roman Modlinger (The Forestry and Game Management Research Institute, Prague, Czech Republic) for providing the material, Karel Rébl (Nové Strašecí, Czech Republic) for providing the data from his collection, and Vladimír Švihla (National Museum, Prague, Czech Republic) for help with identification.

References

Bretzendorfer F., 2002: Kleine Mitteilungen. 124. *Malthodes alpicola* Kiesenwetter, 1852 (Col., Cantharidae) – Neu für Württemberg und Luxemburg. *Mitteilungen Entomologischen Verein Stuttgart*, 37: 63.

Dahlgren G., 1979: 27. Familie: Cantharidae (ohne Tribus Malthinini), pp. 18–39. In: *Die Käfer Mitteleuropas. Band 6. Diversicornia*, Freude H., Harde K.W. & Lohse G.A. (eds) Goecke, & Evers, Krefeld, 367 pp.

Kazantsev S. & Brancucci M., 2007: Cantharidae, pp. 234–298. In: *Catalogue of Palaearctic Coleoptera. Volume 4. Elateroidea – Derodontoidea – Bostrichoidea – Lymexyloidea – Cleroidea – Cucujoidea*, Löbl I. & Smetana A. (eds) Apollo Books, Stenstrup, 935 pp.

Kuska A., 1995: *Omomilki (Coleoptera, Cantharidae): Cantharinae i Silinae Polski* [*Soldier beetles (Coleoptera, Cantharidae): Cantharinae and Silinae of Poland*]. Wydawnictwo Instytutu Systematyki i Evolucii Zwierzat Polskiej Akademii Nauk, Kraków, 201 pp. (in Polish)

Müller J. & Gossner M., 2010: Three-dimensional partitioning of diversity informs state-wide strategies for the conservation of saproxylic beetles. *Biological Conservation*, 143: 625–633.

Pruner M. & Míka P., 1996: Seznam obcí a jejic částí v České republice s čísly mapových polí pro síťové mapování fauny [List of settlements in the Czech Republic with associated map fields codes for faunistic map system]. *Klapalekiana*, 32 (supplementum): 1–115.

Švihla V., 1978: Faunistic records from Czechoslovakia. Coleoptera, Cantharidae. *Acta Entomologica Bohemoslovaca*, 75: 201.

Švihla V., 1993: Cantharidae, pp. 82–83. In: Check-list of Czechoslovak Insects. IV (Coleoptera), Jelínek J. (ed.) *Folia Heyrovskyana*, Supplementum 1: 1–172.

Švihla V., 2005: Cantharoidea (páteříčci), pp. 477–478. In: *Červený seznam ohrožených druhů České republiky. Bezobratlí* [*Red list of threatened species in the Czech Republic. Invertebrates*], Farkač J., Král D. & Škorpík M. (eds) Agentura ochrany přírody a krajiny ČR, Praha, 760 pp.

Švihla V., 2006: Resurrection of *Cantharis* (*Cyrtomoptila*) *fibulata* (Coleoptera: Cantharidae). *Studies and Reports of District Museum Prague-East*, *Taxonomical Series,* 2: 123–127.

Received: 15 January 2010
Accepted: 15 March 2010