

New and unpublished data about the ground beetles (Coleoptera: Carabidae) of Bulgaria

TEODORA TEOFILOVA

Institute of Biodiversity and Ecosystem Research (IBER), Bulgarian Academy of Sciences (BAS), 1 Tsar Osvoboditel Blvd., 1000 Sofia, Bulgaria, obero_n_zoo@abv.bg

Abstract. Bulgarian carabid fauna is relatively well studied but there are still many species and regions in the country lacking enough research. This study gives new information about 28 carabid species and 15 zoogeographical regions and subregions in Bulgaria. There are 10 species recorded for the first time in different regions. Three species are reported for the second time in the regions where they were currently collected. Eleven species haven't been reported since 1995 from the Predbalkan Region, Ihtimanska Sredna Gora Mts., Sandanski-Petrich Valley, Vitosha Mts., Rila Mts., Pirin Mts., and Kraishte Region.

Key words: carabids, addition, new records, Bulgaria, distribution.

Introduction

Ground beetles (Coleoptera: Carabidae) are relatively well studied in Bulgaria. According to the last edition of the Palaearctic catalogue of the ground beetles, 741 species of the Carabidae are listed for Bulgaria (Löbl & Löbl 2017). According to own recent estimations, however (Teofilova & Guéorguiev, unpubl. data), this number is not precise because there are another 31 species more which have not been included in that catalogue, but they are proved for Bulgaria. In addition, we consider another 25 of the species listed in Löbl & Löbl (2017) as either not occurring, or still doubtful for the country. Therefore, the total number of the species currently established in Bulgaria should be 747. Despite the relatively large number of publications, the group cannot be considered sufficiently studied in Bulgaria due to a lack of systematic research on species composition, distribution of the fauna, peculiarities in the ecology of many species. There is also insufficient information on the carabids' taxonomic composition in different types of ecosystems from many regions.

Material and Methods

The most material on which this study is based is outcome of a field work carried out in different localities in Bulgaria in the period from 1978 to 2020. This material was collected by means of different sampling methods, such as handpicking, pan, Malaise, or pitfall trapping. All specimens are stored in the private collection of the author in the Institute of Biodiversity and Ecosystem Research (BAS, Sofia). The material was determined by the author, if not, that was pointed in the text. All material determined by others was re-examined by the author. The following abbreviations of the collectors' names are used in the text: DC – Dragan Chobanov, IT – Ivaylo Todorov, IV – Ilko Vassilev, LP – Lyubomir Penev, NK – Nikolay Kodzhabashev, OI – Ognyan Iliev, OT – Ognyan Todorov, SS – Stefaniya Sabeva, TL – Toshko Ljubomirov, YG – Yuli Ganey, VG – Vasil Genchev, VGu – Vyara Gusseva, VP – Vlada Peneva (Radkova), VS – Vladimir Sakalian. The abbreviations of the

zoogeographical regions are as follows: BS – Black Sea Coast, DE – Eastern Danubian Plain, PRW – Western Predbalkan, SPM – Middle Stara Planina Mts., SGI – Ihtimanska Sredna Gora Mts., WB – Western Bulgaria, K – Kraishte Region, BSM – Boboshevo-Simitli Valley, SPT – Sandanski-Petrich Valley, V – Vitosha Mts., R – Rila Mts., P – Pirin Mts., T – Thracian Lowland, RDW – Western Rhodope Mts., RDE – Eastern Rhodope Mts.

Results and Discussion

The present study is based on various field observations and contains data about 28 carabid species, collected in 15 zoogeographical regions and subregions in Bulgaria. There are 10 species recorded for the first time in different regions. They are marked with three asterisks (***). Three species are reported for the second time in the regions where they were currently collected – marked with two asterisks (**). Eleven species haven't been reported for the given regions since 1995 – marked with an asterisk (*).

SPECIES LIST:

ELAPHRINAE Erichson, 1837

ELAPHRINI Erichson, 1837

1. ***Elaphrus (Elaphroterus) aureus aureus* P.W.J. Müller, 1821**

Material: DE** (Malak Preslavets Vill., about 120 m, 1♂, 12.VI.1989, leg./det. NK).

2. ***Elaphrus (Neoelaphrus) uliginosus* Fabricius, 1792**

Material: R* (Samokov, about 1000 m, 1♂, 17.V.1989, leg. OI, det. NK).

OMOPHRONINAE Bonelli, 1810

OMOPHRONINI Bonelli, 1810

3. ***Omophron (Omophron) limbatum* (Fabricius, 1777)**

Material: BSM*** (Bachinovo Vill., 430 m, 1 ex., 30.III.1981, leg./det. VP).

SCARITINAE Bonelli, 1810

CLIVININI Rafinesque, 1815

4. ***Clivina fossor fossor* (Linnaeus, 1758)**

Material: PRW*** (Reselets Vill., 1 ex., 10.VII.1978, leg. IV, det. A. Dostal).

DYSCHIRIINI W. Kolbe, 1880

5. ***Dyschiriodes (Eudyschirius) globosus* (Herbst, 1784)**

Material: DE ("Longoza" Reserve, about 20 m, 1 ex., 10.VI.1993, 1 ex., 21.IX.1993, leg. OI, det. D. Fedorenko; Srebarna Lake, 1 ex., 1989, leg. NK, det. D. Fedorenko).

6. ***Dyschiriodes (Dyschiriodes) aeneus aeneus* (Dejean, 1825)**

Material: DE (Srebarna Lake, 3 ex., 10.IX.1989, leg. NK, det. D. Fedorenko).

7. ***Dyschiriodes (Dyschiriodes) agnatus* (Motschulsky, 1844)**

Material: SPT (Parvomay Vill., 1 ex., 23.VII.1985, leg. IV, det. D. Fedorenko).

8. ***Dyschiriodes (Dyschiriodes) chalybeus gibbifrons* (Apfelbeck, 1899)**

Material: DE (Srebarna Lake, 1 ex., 1989, leg. NK, det. D. Fedorenko).

9. ***Dyschiriodes (Dyschiriodes) nitidus nitidus* (Dejean, 1825)**

Material: DE (Srebarna Lake, 4 ex., 10.IX.1989, 2 ex., 1989, leg. NK, det. D. Fedorenko); P* (Breznitsa Vill., about 700 m, 1 ex., 20.VII.1983, leg. IV, det. D. Fedorenko).

PATROBINAE Kirby, 1837

PATROBINI Kirby, 1837

10. ***Patrobus atrorufus* (Ström, 1768)**

Material: K* (Razhdavitsa Vill., about 500 m, meadow, 1♀, X.1984, leg. VS).

BRACHININAE Bonelli, 1810

BRACHININI Bonelli, 1810

11. ***Aptinus (Aptinus) bombardata* (Illiger, 1800)**

Material: PRW*** (Reselets Vill., 1♀, 20.VI.1981, leg. IV, det. H. Freude); SPM (N Shipka Peak, N 42°45'24", E 25°19'25", 1160 m, 47♀50♂, 6.IX.2012, leg. OT).

12. ***Brachinus (Brachinus) crepitans (Linnaeus, 1758)***

Material: SGI* (SE German Vill., N 42°36'03", E 23°26'34", 790 m, 1♂, 2.VI.1999, leg./det. NK); WB (NW Pancharevo, N 42°36'20", E 23°23'45", 670 m, 1♂, 30.V–12.VI.2019, leg. IT).

13. ***Brachinus (Brachinus) ejaculans Fischer von Waldheim, 1828***

Material: DE (Srebarna Lake, 1♂, 25.IX.1989, leg./det. NK).

14. ***Brachinus (Brachinus) elegans Chaudoir, 1842***

Material: DE (Srebarna Lake, 1♂, 25.IX.1989, leg./det. NK).

15. ***Brachinus (Brachynidius) explodens Duftschmid, 1812***

Material: SPT (Kozhuh Mt., about 230 m, 1♂, 25.VII.1982, 1♀, 20.X.1982, leg. YG).

HARPALINAE Bonelli, 1810

PANAGAEINI Bonelli, 1810

16. ***Panagaeus (Panagaeus) bipustulatus (Fabricius, 1775)***

Material: V* ("Bulg. Vitoscha", 1200 m, 1♀, 11.VIII.1983, leg. VGu, det. O. Kryzhanovskij); RDW (Chepelare, about 1230 m, 1 ex., 27.IV.1983, leg. YG).

CHLAENIINI Brullé, 1834

17. ***Chlaenius (Agostenus) alutaceus Gebler, 1829***

Material: SPT* (Kozhuh Mt., about 230 m, 1♀, 15.VII.1982, leg. YG, det. NK).

18. ***Chlaenius (Chlaeniellus) nigricornis (Fabricius, 1787)***

Material: PRW*** (Hubavene Vill., 300 m, 1♀, 16.V.1981, leg. IV, det. O. Kryzhanovskij).

19. ***Chlaenius (Chlaeniellus) nitidulus (Schrank, 1781)***

Material: P*** (near Bansko, about 900 m, 1♀, 16.VII.1982, leg. IV, det. H. Freude).

20. ***Chlaenius (Chlaeniellus) vestitus (Paykull, 1790)***

Material: PRW*** (Hubavene Vill., about 300 m, 1♀, 16.V.1981, leg. IV, det. VP); RDE (Zlatograd, about 500 m, 1♂, 5.VIII.1982, leg. IV, det. VP).

21. ***Chlaenius (Chlaenites) spoliatus spoliatus (P. Rossi, 1792)***

Material: BS (Durankulak Marsh, 0 m, under stones, 1♂, 23.VII.1992, leg. LP, det. NK).

LICININI Bonelli, 1810

22. ***Badister (Badister) bullatus (Schrank, 1798)***

Material: PRW*** (Resets Vill., about 300 m, 1♀, 15.VII.1979, 1♀, 20.VI.1981, leg. IV, det. E. Kirschenhofer).

23. ***Badister (Badister) meridionalis Puel, 1925***

Material: V*** (Kopitoto Site, about 1300 m, 1♂, 2.VI.1979, leg. VP).

24. ***Badister (Baudia) collaris Motschulsky, 1844***

Material: SPT*** (Kozhuh Mt., about 230 m, 2♂, 15.V.1982, leg. YG, det. NK).

25. ***Licinus (Licinus) depressus (Paykull, 1790)***

Material: V** (Kopitoto Site, 1340 m, 1♂, 29.III.1980, leg. VP; "Bulg. Vitoscha, 1600 m", 1♂, 31.IX.1984, leg. SS, det. O. Kryzhanovskij); R* (Bistritsa Vill., 940 m, 1♀, 12.X.1980, leg. VP).

26. ***Licinus (Licinus) silphoides (P. Rossi, 1790)***

Material: SPT* (Kozhuh Mt., about 230 m, 1♀, 17.VII.1982, leg. YG); RDW** (Besaparski Ridove Hills, E Kapitan Dimitriev Vill., N 42°06'20", E 24°22'27", 506 m, 1♀, 22.IV.2017, leg. DC; Besaparski Ridove Hills, S Sinitovo Vill., N 42°07'39", E 24°22'38", 322 m, 1♂, 29.V–22.VI.2020, leg. TL).

MASOREINI Chaudoir, 1870

27. ***Masoreus (Masoreus) wetterhallii wetterhallii (Gyllenhal, 1813)***

Material: V* ("Bulg. Vitoscha", 1202 m, 1♀, 13.VIII.1983, leg. VGu, det. O. Kryzhanovskij).

DRYPTINI Bonelli, 1810

28. ***Drypta (Drypta) dentata (P. Rossi, 1790)***

Material: V*** (Dragalevtsi Vill., about 750 m, 1♂, 26.III.1988, leg. M. Petkov); T (Yagodovo Vill., N 42°06'38", E 24°51'04", 159 m, house yard, 1♂, 28.VIII.2020, leg. VG).

The study gives some novelty about the carabid fauna of Bulgaria. Ten of the species collected are recorded for the first time in different regions. *Aptinus bombardata*, *Badister bullatus*, *Clivina fossor*, *Chlaenius nigricornis* and *Chlaenius vestitus* are new to the Western Predbalkan. The first three species are new to the whole Predbalkan as well. *Omophron limbatum* is new to the Boboshevo-Simitli Valley; *Badister collaris* is new to the Sandanski-Petrich Valley; *Badister meridionalis* and *Drypta dentata* are new to the Vitosha Mts., and *Chlaenius nitidulus* is here reported firstly for the Pirin Mts.

Three species are reported for the second time in the regions where they were currently collected. *Elaphrus aureus* is reported for the second time in the Danubian Plain after Guéorguiev & Guéorguiev (1995a). *Licinus depressus* has been reported for the Vitosha Mts. only by Krusteva *et al.* (1995). Only Guéorguiev & Guéorguiev (1995b) report *Licinus silphoides* from the Western Rhodope Mts.

Eleven species haven't been reported for the given regions since 1995. Guéorguiev & Guéorguiev (1995a) are the last who reported: *Chlaenius nigricornis* and *Chlaenius vestitus* for the Predbalkan Region; *Chlaenius alutaceus* and *Licinus silphoides* for the Sandanski-Petrich Valley; *Masoreus wetterhallii* for the Vitosha Mts.; *Elaphrus uliginosus* and *Licinus depressus* for the Rila Mts. The last records of *Dyschiriodes nitidus* from the Pirin Mts. are in Guéorguiev & Guéorguiev (1995a) and Guéorguiev & Guéorguiev (1995b). Sakalian & Guéorguiev (1995) are the last to report *Patrobus atrorufus* from the Kraishte Region, and the last record of *Panagaeus bipustulatus* for the Vitosha Mts. is in Krusteva *et al.* (1995). *Brachinus crepitans* is reported by Rambousek (1912) and Guéorguiev & Guéorguiev (1995a) for the Ihtimanska Sredna Gora Mts.

Although the ground beetle fauna of Bulgaria is relatively well studied, there are still some regions representing "white spots" in relation to the knowledge about their carabid species composition and community structure (like different parts of the Danubian Plain and Stara Planina Mts., Predbalkan and Podbalkan Regions, Sakar Mts., some mountains near Sofia, Mesta River Valley). The more complete knowledge of the diversity of this group in the country could be revealed only after carrying out further studies in these poorly-examined regions.

Acknowledgements. The author is grateful to all collectors for providing specimens and to the reviewers for their valuable comments.

References

- Guéorguiev, V. B. & Guéorguiev, B. V. (1995a) *Catalogue of the ground-beetles of Bulgaria (Coleoptera: Carabidae)*. PENSOFT Publishers, Sofia-Moscow, 279 pp.
- Guéorguiev, V. B. & Guéorguiev, B. V. (1995b) La faune des Carabidae (Coleoptera) des hautes montagnes de Bulgarie. *Acta Zoologica Bulgarica*, 48: 77-85.
- Krusteva, I., Popov, V. & Sakalian, V. (1995) Indirect gradient analysis of carabid (Coleoptera, Carabidae) spatial pattern on Vitosha Mountain (West Bulgaria). *Third National Scientific Conference on Entomology, 18-20 September 1995, Sofia*, pp. 55-59.
- Löbl, I. & Löbl, D. (Eds.) (2017) *Catalogue of Palaearctic Coleoptera. Archostemata-Myxophaga-Adephaga. Vol. 1. Revised and Updated Edition*. Koninklijke Brill NV, Leiden, 1443 pp.
- Rambousek, F. G. (1912) Fauna Coleopterorum Bulgarica. *Travaux de la Société Bulgare des Sciences Naturelles*, 5: 57-113. (in Bulgarian).
- Sakalian, V. P. & Guéorguiev, B. V. (1995) Faunistical and zoogeographical studies on Carabidae (Coleoptera) in the Zemen gorge (Southwestern Bulgaria). *Acta Zoologica Bulgarica*, 48: 68-76.