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Critical Review of the Families Glaresidae, Lucanidae, Trogidae, Bolboceratidae, Geotrupidae, Hybosoridae and Ochodaeidae in Bulgaria (Coleoptera: Scarabaeoidea)

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Abstract. The study contributed to the faunistics and taxonomy of seven scarab families in Bulgaria. It includes new faunal data, revision of identified and published material, and critical review of the literature. According to reliable data, 34 species totally inhabit the country. Genus *Codocera* and species *Platycerus caprea*, *Codocera ferruginea* and *Ochodaeus cornifrons* were found for the first time. The occurrence of *Dorcus peyroni*, *Ceruchus chrysomelinus*, *Trox sabulosus*, *Lethrus reaymondi*, *L. schaumii* and *Ochodaeus thalycroides* is confirmed. The occurrence of *Trox eversmannii* needs further confirmation. Genus *Ceratophyus* and 4 species are deleted from the list. Other 4 species probably can be found in the country. Distinctive features of the close related taxa are illustrated as new characters used for the differentiation of both Bulgarian *Dorcus* species.

Key words. Coleoptera, Scarabaeoidea, review, new records, Bulgaria.

Introduction

Ignoring only stag beetles (Lucanidae), Mikšić (1957) made the first attempt for inventory of the Bulgarian Scarabaeoidea. He noted 124 species 7 of which are from the families mentioned here. Král, Malý (1993) made an important contribution, without the claim to be a full list. Both authors listed 64 new, rare or zoogeographically important taxa for the fauna. Seven of these belong to the families treated here, and such as *Dorcus peyroni*, *Aesalus scarabaeoides* and *Trypocopris fulgidus* were mentioned as new to the country. In fact the second taxon was noted earlier (Palm 1966). Excluding several omissions, the recent study of Bunalski (2001) represents most complete list of the Bulgarian Scarabaeoidea. It enumerates 245 species group-taxa as 28 of them are from the groups discussed here. In the last paper *Lethrus elephas* is excluded, and *Aesalus scarabaeoides*, *Sinodendron cylindricum* and *Ochodaeus thalycroides* are indicated as new to the fauna. Actually only the last species has never been cited for Bulgaria.

The presence of unpublished material, including scarab taxa unknown to the Bulgarian fauna, as well as the necessity of critical review of both identified materials

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and published works are the reasons for making this research. The paper appears also the first one from a series of studies dealing with the Bulgarian representatives of the superfamily.

Material and Methods

Unpublished and published material from the National Museum of Natural History, Sofia, and the Institute of Zoology, Sofia (where the large ex-collection of B. Zacharieva is kept), was identified or reviewed by the first author. Prof. Dr. D. Král identified or revised all specimens of genus *Lethrus* from both collections. Unpublished material collected by Polish and German zoologists and identified or revised by, respectively, the second author and Prof. Dr. A. Reichenbach is included, too. Dr. E. Piattella identified one specimen of *Ochodaeus cornifrons*, caught recently by Mr. E. Migliacchio.

New data are given for the rare species, whereas for the common species such records are neglected. For rare and insufficiently studied taxa, the finds from the literature are listed, too. The arrangement of the families follows the recent studies on the higher classification of Scarabaeiformia (Browne, Scholtz 1995, Scholtz, Browne 1996, Scholtz, Chown 1995) as the subfamilies, genera, subgenera and species are sorted alphabetically. The synonyms of taxa, spread out through the mentioned references, are given.

The abbreviations used in the text are: * - genus or species new for Bulgaria; # - genus or species incorrectly cited for Bulgaria in result of misidentification and for that reason excluded from the list of species; ? - species doubtful for the Bulgarian fauna which needs cogent confirmation; {} - species, which probably occurs in Bulgaria; m. - male specimen(s); f. - female specimen(s); ex. - specimen(s); rev. - determination revised; NMNHS - coll. National Museum of Natural History, Sofia; IZ - coll. Institute of Zoology, Sofia; CB - coll. Marek Bunalski, CM - coll. Enrico Migliacchio; CR - coll. Andreas Reichenbach; AP - A. Prostov leg.; ASL - A. Slivov leg.; ASZ - A. Szujecki leg.; AU - A. Urumova leg.; BA - B. Achtarov leg.; BB - B. Burakowski leg.; BG - B. Guéorguiev leg.; BPS - B. Pisarski leg.; BPT - B. Pittioni leg.; BZ - B. Zacharieva leg.; DEI - D. Iltschev leg.; DII - D. Ioakimov leg.; DW - D. Wrase leg.; EM - E. Migliacchio leg.; GG - G. Georgiev observed; GS - G. Stoyanov leg.; HL - Hristo Lukov leg; IB - I. Buresch leg.; JG - J. Gutowski leg.; JM - J. Milde leg.; KT - K. Tuleshkov leg.; MV - M. Vitanova leg.; NA - N. Atanasov leg.; NF - N. Fenenko leg.; NK - N. Karnoschitzky leg.; NN - N. Nedelkov leg.; NR - N. Radev leg.; NV - N. Vihodcevsky leg.; PB - P. Beron leg.; PC - P. Croy leg.; PD - P. Drenski leg.; PP - P. Petkov leg.; PT - P. Tschorbadjiev leg.; RB - R. Bielawski leg.; SK - S. Kantardjieva leg.; SL - S. Lazarov leg.; TL - T. Lyubomirov leg.; VGU - V. Guéorguiev leg.; VGR - V. Grigorov leg.; VM - V. Martino leg.; VR - V. Rosnev leg.; VS - V. Sakalian leg.

Systematic Part

GLARESIDAE Semenov-Tian-Shanskij, Medvedev, 1932

Glaresis Erichson, 1848

Glaresis rufa Erichson, 1848

Glaresis rufa: Gottwald 1966: 166 (without exact locality); Král, Malý 1993: 20 (Thracean Lowland: Harmanli; Black Sea Coast: Sozopol)); Bunalski 1999: 50 (Black

Sea Coast: reserve of Arkutino, 10 ex. rev. CB); BUNALSKI 2000: 87, 90 (repeated old data); BUNALSKI 2001: 166 (repeated old data).

Distribution: South-East European.

LUCANIDAE LATREILLE, 1804

AESALINAE MACLEAY, 1819

Aesalus FABRICIUS, 1801

Aesalus scarabaeoides (PANZER, 1794)
Aesalus scarabaeoides: PALM 1966:15 (Black Sea Coast: Nessebar); KRÁL, MALÝ 1993: 20 (Black Sea Coast: Arkutino); BUNALSKI 2001: 166 (Black Sea Coast: Arkutino).

NEW DATA: Maleshevska Mt.: West Gorna Breznitsa, locality Ribarnitsite, 720-740 m, soil traps in dense forest of *Platanus orientalis*, 19.VI.-16.VII.2003, BG (1 ex. NMNHS).

This species inhabits the low-lying dense oak woods. The Bulgarian populations belong to the nominotypical subspecies, whereas ssp. *meridionalis* BARTOLOZZI, 1989, lives in South Italy.

Distribution: European.

LUCANINAE LATREILLE, 1804

Ceruchus MACLEAY, 1819

Ceruchus crysomelinus (HOCHENWARTH, 1785)
Ceruchus chrysomelinus: HORION 1958: 283 (Rila Mt.: Kalinin Peak).

NEW DATA: Rila Mts.: 'Rhodopes'. Belovo JM (1 m. NMNHS) / Parangalitsa Reserve, 1.VII.1932, PD (1 m., 1 f. IZ).

Rare species confirmed for Bulgaria. It is known from a few localities in the West Balkans (MIKŠIĆ 1955). Except the Bulgarian finds east of the line Morava - Vardar, *C. chrysomelinus* is cited only from the Serbian section of the West Stara Planina (op. cit.: 228). So far Rila is the southernmost locality in its areal (HORION 1958).

Distribution: European-West Siberian.

Dorcus MACLEAY, 1819

Dorcus parallelipipedus (LINNAEUS, 1758) (= *parallelopipedus* auct.)
Dorcus parallelopipedus: IOAKIMOV 1899: 8; MARKOVICH 1904: 240; KOVACHEV 1905: 8; NEDELKOV 1905: 418; MARKOVICH 1909: 10; NETOLITZKY 1912: 163; MIKŠIĆ 1955: 226; ANGELOV 1960: 22; MUCHE 1963: 72; ANGELOV 1964: 309; ANGELOV 1968: 142; NIKOLOVA 1968: 138; KODZHABASHEV, PENEV 1998: 78. *Dorcus parallelipipedus*: IOAKIMOV 1904: 21; NEDELKOV 1909b: 97; BUNALSKI 2001: 166.

Probably, the genus' record of PALM (1966: 15) from the vicinity of Nessebar refers to this species. It is the most abundant representative of Lucanidae in Bulgaria that can be found in all woody regions, in a wide vertical interval.

Distribution: Europe, Asia Minor, Morocco.

Dorcus peyroni REICHE, 1856
Dorcus peyroni: KRÁL, MALÝ 1993: 20 (Middle Struma Valley: Simitli, Lebnitsa, Sandanski; East Rhodopes: Momchilgrad).

NEW DATA: Middle Struma Valley: Kresna ("Spirka Kresna"), 10-12.V.1976, ASL (1 f. IZ).

The first author studied more than 150 specimens of *Dorcus* from the collections of NMNHS and IZ, including such from the Maleshevska Mts., Belasitsa, Slavyanka, Burgas Region and Strandzha, and found out only single female of *D. peyroni*. As OERTZEN (1886: 238, note 1) stated, this is a very rare species, which is confirmed here for the Bulgarian fauna. Some of the differential characters, introduced by REITTER (1893) for its distinguishing from the other congeners, are variable. That is why we enumerate five more or less stable features (Table 1), listed in the sequence of their importance.

Distribution: East Mediterranean (South Bulgaria, Greece, Asia Minor, Syria) - Transcaucasian (the basin of the Arax River).

Table 1. Characters of use in the distinction of both Bulgarian species of genus *Dorcus*.

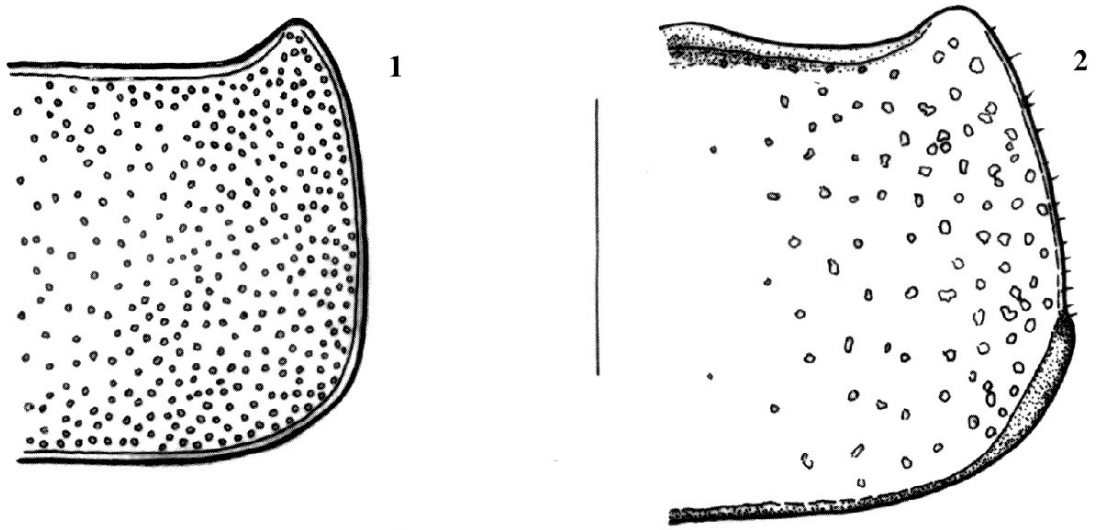
Character	*D. parallelipipeudus*	*D. peyroni*
Shape of pronotum	Figure 1	Figure 2
Distal process of metatibia	Weakly developed and subparallel to tibia (Figure 3)	Well developed and oblique (Figure 4)
Length of pilosity on legs and body underneath	Very short or reduced (Figure 3)	Very long (Figure 4)
Punctuation on pronotum	Finer, almost uniform on entire dorsal surface (Figure 1)	Coarse, denser near lateral margin and sparse in centre (Figure 2)
Lustre of body from above	Matt	Metallic shiny

Lucanus SCOPOLI, 1763

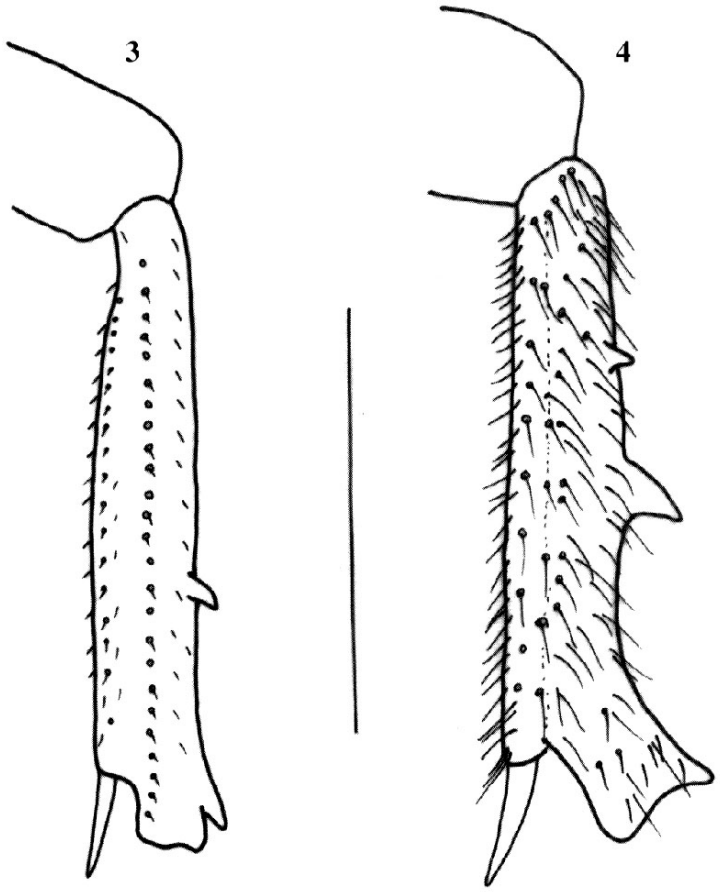
Lucanus cervus (LINNAEUS, 1758) (= *capreolus* SULZER, 1776; *turcicus* STURM, 1843; *pentaphylus* REICHE, 1853)

Lucanus cervus: BASSANOVICH 1891: 19; IOAKIMOV 1904: 21; MARKOVICH 1904: 240; KOVACHEV 1905: 8; NEDELKOV 1905: 418; MARKOVICH 1909: 10; NEDELKOV 1909b: 97; NETOLITZKY 1912: 163; DRENSKI 1942: 29; CSIKI 1943: 215; ANGELOV 1960: 22; ANGELOV 1964: 309; ANGELOV 1968: 142; KODZHABASHEV, PENEV 1998: 78. *Lucanus servus*!: IOAKIMOV 1899: 8. *Lucanus pentaphylus*: IOAKIMOV 1904: 21. *Lucanus turcicus*: IOAKIMOV 1904: 21. *Platycerus cervus* var. *turcicus*: NEDELKOV 1905: 418; NEDELKOV 1909b: 97; PANIN 1941: 13. *Lucanus cervus* var. *capreolus*: CSIKI 1943: 215. *Lucanus cervus cervus*: BUNALSKI 2001: 166. *Lucanus cervus turcicus*: MIKŠIĆ 1955: 225; BUNALSKI 2001: 166.

The genus' mention of PALM (1966: 15) from Nessebar refers to this species. According to MIKŠIĆ (1955) and HORION (1958), ssp. *turcicus* lives in the eastern and the southern parts of the Balkans. The last form is distinct from the nominotypical one in the sixth (typical *turcicus*) or fifth (*turcicus* ab. *penthaphylus*) articulated paddle of antennae. However, the presence of aberrations with similar articulation in France leads to conclusion that it is a variable species not forming distinct subspecies. The Bulgarian law for protection of nature protects *L. cervus*. The abundant material available in NMNHS and IZ, the observations of the first author and other native zoologists confirm the opinion that the species is common in Bulgaria. Usually it could be met in the lowest forest areas in the country.



Figs. 1-2. Dorsal aspect of pronotum: *Dorcus parallelipipedus* (Fig. 1), *D. peyroni* (Fig. 2). Scale line = 0.3 mm.



Figs. 3-4. Dorsal aspect of metatibia: *Dorcus parallelipipedus* (Fig. 3), *D. peyroni* (Fig. 4). Scale line = 0.3 mm.

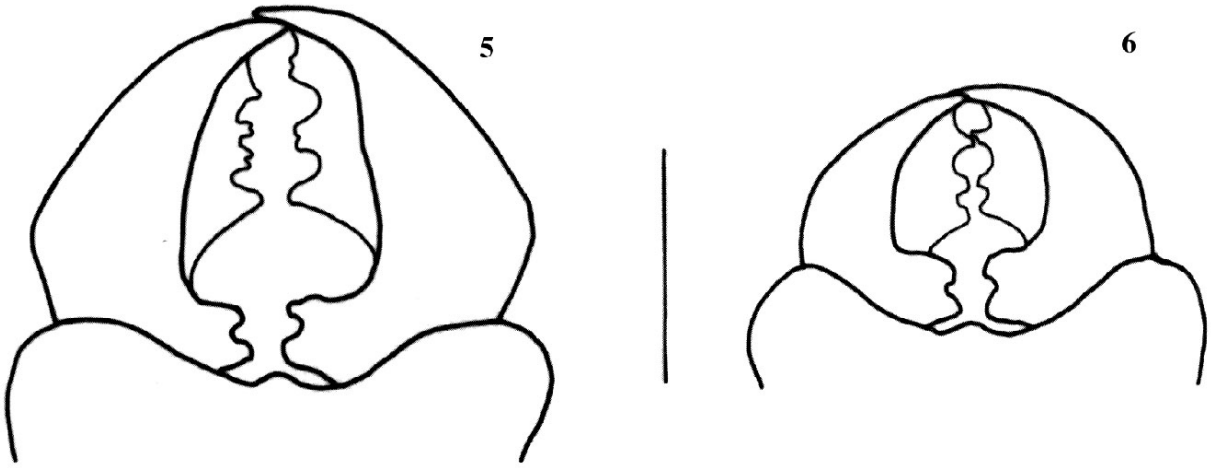
Distribution: Europe, Caucasus, Asia Minor, Transcaucasus, Syria.

Platycerus O. F. MÜLLER, 1764 (= *Systenocerus* WEISE, 1883)

* *Platycerus caprea* (DEGEER, 1774)

MATERIAL STUDIED: Vitosha Mts.: Boyanski Vodopad Cataract (ca. 1300 m altitude), 9.VI.1932, SK (1 ex., NMNHS). Rila Mts.: Borovets (= Tscham-Kuria), 1500 m, 26.V.1913, IB (1 m., NMNHS).

Since both European species of the genus have variably coloured back (metallic blue or green) and very similar habitus, they are not easy to distinguish and are consequently frequently mistaken for one another. *P. caprea* can be distinguished reliably from its congener by the shape of upper inner edge of the mandibles (Figs. 5-6), the disc of pronotum more sparsely punctuated with distinct smooth areas and the lateral border of the pronotum not convex before the hind angles. In Central / South Europe



Figs. 5-6. Dorsal aspect of upper inner edge of mandibles: *Platycerus caprea* (Fig. 5), *P. caraboides* (Fig. 6). Scale line = 0.1 mm.

it lives only in high forests and subalpine belts situated usually above the habitats of *P. caraboides*. In the Vitosha Mts., between 1200-1500 m, and near Borovets, 1500 m, the two species live sympatrically. Both specimens studied were collected on northern slopes, covered with coniferous forests, where typical boreal environment exists. From the Balkan Peninsula, *P. caprea* was cited only once from the Montenegro-Albanian bordered area (HORION 1958), probably from the North Albanian Alps.

Distribution: Boreo-mountainous species (HORION 1958) with European-South Siberian range, to the east it reaches the Amur Region (NIKOLAJEV 1989).

Platycerus caraboides (LINNAEUS, 1758)

Platycerus caraboides: IOAKIMOV 1904: 22; ANGELOV 1964: 308; ANGELOV 1968: 142; BUNALSKI 2001: 166. *Systenocerus caraboides*: NEDELKOV 1905: 418; NEDELKOV 1909a: 32 (Sofia /sub Vitosha/, 1 ex. rev, NMNHS); NETOLITZKY 1912: 163; MIKŠIĆ 1955: 227.

NEW DATA: Lyulin Mts.: Gorna Banya, 6.V.1913 (1 ex. NMNHS); above Knyazhevo, 25.V.1921, DEI (1 ex. NMNHS); around the Dupevitsa Peak, 25.V.2002, EM (1 ex. CM). Vitosha Mts.: Knyazhevo, 1902, IB (1 ex. NMNHS); Vladaya, 5.VI.1938, PD (1 ex. NMNHS); BAN holiday station, 13.VI.1952, NV (1 ex. NMNHS). Zemenska Mts.: Rigla Peak, 17.IV.1913, PP (1 ex. NMNHS). Rila Mts.: Rila Monastery, 12.VI.1910, DII (1 ex. IZ); Kostenets, V.1912, IB (2 ex. NMNHS); Borovets (= Chamkoria), 15-30.VIII.1920, IB (1 ex. IZ); same locality, 1.VIII.1932, PD (1 ex. IZ). Pirin Mts.: Popina Laka, 1200 m, 17. VI. 1980, JG (1 ex. CB). Western Rhodopes: Assenovgrad (= Stanimaka), 1.V.1909 (1 ex. NMNHS); Bachkovski Monastery, 14.V.1923, DEI (1 ex. IZ); Polkovnik Serafimovo near Smolyan, 5.VII.1969 (1 m. NMNHS); Rudozem, 8.V.1971 (1 ex. NMNHS). Maleshevska Mts.: W "St. Iliya" Monastery, 900-1000 m, 2.V.2003, BG (1 ex. NMNHS) / W Gorna Breznitsa, 750-800 m, soil traps, 1.V.-20.VI.2003, dense forest of *Platanus orientalis*, BG (1 ex. NMNHS). Strandzha Mts.: Kosti, 29-30.IV.1921, PP (3 ex. NMNHS).

After *Dorcus parallelipipedus* and *Lucanus cervus*, this is the third most common stag beetle in Bulgaria. The find of ANGELOV (1964: 308) from the Western Rhodopes (Ardashla, 1750 m) probably is based on misidentified material of *P. caprea*.

Distribution: European.

Sinodendron SCHNEIDER, 1791

Sinodendron cylindricum (LINNAEUS, 1758)
Sinodendron cylindricum: IOAKIMOV 1904: 22 (Sredna Gora Mts.); NEDELKOV 1905: 418; NEDELKOV 1909a: 32; NEDELKOV 1909b: 97 (Sredna Gora Mts.); BUNALSKI 2001: 166.

NEW DATA: Western Stara Planina: Gorna and Dolna Bela Rechka, 7.V.1909 (1 ex. NMNHS); Varshets (= Zanozhene), 8.V.1909 (2 ex. IZ); Gorni Lom, 1000 m, GG (1 m.). Central Stara Planina: Kaloferska Planina Mts., Groba Peak, 4.IV.1924, DEI (1 ex. NMNHS). Eastern Stara Planina: Chumerna Peak, 18.VII.1916, PT (1 ex. NMNHS). Vitosha Mts.: 7.V.1939, HL (1 ex. NMNHS); 1450 m, 12.VII.1955, NA (3 m. NMNHS). Rila Mts.: Rila Monastery (1 ex. NMNHS) / 22.VI.1939, BPT (2 ex. IZ) / 5.VIII.1956 (1 ex. NMNHS), NA; Kostenets, 26.VII.1908, IB (1 m. NMNHS) / 5.VII.1928 (1 ex. NMNHS), PD / 26.VI.1939, GS (1 ex. NMNHS); Borovets (= Chamkoria), 1.VII.1923, IB (1 ex. NMNHS). Western Rhodopes: Shiroka Laka, 27.VI.1924 (1 ex. NMNHS) / Lepavitsa Cave, 28.VII.1925 (2 ex. NMNHS) / Batak-Beglika, 21.VI.1926 (1 ex. NMNHS) / Velingrad (= Chepino), 30.VI.1927, all PD. Maleshevska Mts.: NW Gorna Breznitsa, 1000-1600 m, 15.VI.2002, BG (1 ex. NMNHS). Pirin Mts.: Delchevo, 16.VI.1987 (1 m. NMNHS). Belasitsa Mts.: Kolarovo, 20.VII.1930, PD (5 ex. NMNHS); 20.VII.1930, KT (1 ex. IZ). Black Sea Coast: Maslen Nos Cape (= Zeitin Burun), 16.VII.1933, KT (1 ex. IZ).

This is a local spread forest species, which is rare in its whole range.

Distribution: Europe, Asia Minor, Caucasus, South Siberia (in the east to the Amur Region, NIKOLAJEV 1989), Kazakhstan, and Central Asia.

TROGIDAE MACLEAY, 1819

Trox FABRICIUS, 1775

{*Trox cadaverinus* ILLIGER, 1802. Species distributed in Central-East Europe, Siberia, Caucasus, and Syria (BARAUD 1992).}

? *Trox eversmannii* KRYNICKY, 1832 (= *eversmanni* auct.)
Trox eversmanni!: IOAKIMOV 1904: 21 (Sofia Region).
Distribution: Central-East Europe, Siberia, Caucasus, West Asian Steppe. The species needs further confirmation for Bulgaria.

Trox hispidus (PONTOPPIDAN, 1763)
Trox hispidus: IOAKIMOV 1904: 21 (sub *T. hispidus* FABRICIUS!, Sofia Region: Sofia); NEDELKOV 1905: 16 (Sofia, 1 ex. rev., NMNHS). *Trox sabulosus*: NEDELKOV 1905: 16 (Sofia, 1 ex. rev., NMNHS). *Trox hispidus niger*: PITTINO 1991: 69 (Pirin, Sliven, Kuzbunar, Burgas, Karabair near Burgas).

NEW DATA: Bulgaria (without exact locality) (1 ex. NMNHS). Western Stara Planina Mts., Vrachanska Mts., Okolchitsa Hut, 1045 m, 4.IX.2004, PB (2 m. NNMNHS). Sofia Region: Sofia, 18.V.1905, DII (1 ex. NMNHS); same locality, 16.V.1922, VGR (1 ex. NMNHS). Lozenska Mts.: German Monastery, VII.1911, AU (1 ex. NMNHS). Kraishte Region: Erma Gorge near Tran, 750 m, 22.VIII.2001, EM (1 ex. CM). Maleshevska Mts.: Tsaparevo, 550 m, soil traps, 2-30.VII.2002, SL / TL (1 ex. NMNHS); W Gorna Breznitsa, 780-800 m, soil traps in ecotone (*Platanus orientalis*-forest / meadow) habitat, 9.VII.-23.VIII.2002, BG (1 ex. NMNHS); W Mikrevo, 310 m, soil traps, 7-25.IX.2002, SL / TL (1 ex. NMNHS). Middle Struma Valley: Rupite near

Kozhuh Hills, 20.IV.1983, at light, VR (1 ex. IZ); same locality, 4.IV.1992, VS (1 ex. IZ). Western Rhodopes: Polkovnik Serafimovo near Smolyan, 6.VII.1970 (1 ex. NMNHS). Black Sea Coast: Topoli near Varna, 20.X.1944, on carcass of bird, NK (2 ex. sub *Trox cadaverinus*, NMNHS).

Apparently, this is the most common representative of the genus in Bulgaria.

Distribution: *T. hispidus* s.l. has West Palaearctic, whereas the ssp. *niger* P. Rossi, 1792 (to which all Bulgarian populations belong: Pittino 1991) has European – West Turanian range.

Trox perrisi Fairmaire, 1868

Trox perrisi: Bunalski 1999: 50 (Middle Struma Valley: Melnik env., 1 ex. rev. CB); Bunalski 2000: 86-87 (repeated old data); Bunalski 2001: 166 (repeated old data).

The record of the species from Bulgaria is very interesting in biogeographical aspect.

Distribution: West Mediterranean, Bulgaria.

Trox sabulosus (Linnaeus, 1758)

Trox subulosus!: Angelov 1960: 22 (Thracian Lowland: Plovdiv).

NEW DATA: Sofia Region: Sofia, NN (1 ex. NMNHS). Rila Mts.: Kostenets, 12.V.1912, IB (1 ex. NMNHS). Strandzha Mts.: Kosti, 29-30.IV.1921, PP (1 ex. NMNHS).

Species cited first by Nedelkov (1905: 16), but the revision proves to be *T. hispidus* (see above). Here it is confirmed for the Bulgarian fauna.

Distribution: European-Siberian.

Trox scaber (Linnaeus, 1767)

Trox scaber: Muche 1964: 64 (Black Sea Coast: Nessebar); Bunalski 2000: 86-87, 90 (Eastern Rhodopes: Dolno Cherkovishte, 1 ex. rev. CB; Black Sea Coast: Arkutino Reserve, 1 ex. CB); Bunalski 2001: 166.

NEW DATA: Central Predbalkan: Svirchovitsa Cave near Karlukovo, 2.V.1958, PB (1 ex. NMNHS, sub *T. cadaverinus* Illiger, V. Guéorguiev det.). Sofia Region: Sofia, V.1918 (1 ex. NMNHS) / 16.VI.1936 IB (1 ex. NMNHS); Sofia, "Agr. gr.", 10.VI.1922, VGR (1 ex. NMNHS).

Distribution: Cosmopolitan.

Trox sordidatus Balthasar, 1936

Trox sordidatus: Pittino 1991: 77 (Varna); Baraud 1992: 38 (without exact data); Bunalski 2000: 87 (Eastern Rhodopes: Dolno Cherkovishte); Bunalski 2001: 166.

Distribution: East Mediterranean.

{*Trox transversus* Reiche, 1856. This East Mediterranean species is noted for European Turkey (Mikšić 1957: 186), where it is represented by ssp. *demaisoni* Reitter, 1904.}

BOLBOCERATIDAE Mulsant, 1842

Bolbelasmus Boucomont, 1911 (= *Bolboceras* Stephens, 1830 nec *Bolboceras* Kirby, 1818)

Bolbelasmus unicornis (Schrank, 1789)

Bolboceras unicornis: Kovachev 1905: 7 (Danube Plain: Oryahovo, Vetovo); Markovich 1909: 10 (Danube Plain: Razgrad, 1 m, 1 f., rev., NMNHS and 1 m. rev., IZ).

Bolbelasmus unicornis: NEDELKOV 1909a: 34 (Danube Plain: Pleven, 1 m. rev., NMNHS); ZACHARIEVA-STOILOVA 1974: 128 (Sofia Region: Gorna Malina, 1 f. rev., IZ); KRÁL, MALÝ 1993: 20-21 (Eastern Predbalkan: Shumen; Black Sea Coast: Tsarevo); BUNALSKI 2001: 166.

NEW DATA: South Dobrudzha: Gora Karakus near Dulovo, 14.VI.1952, PD (1 f., NMNHS). Lozenska Mts.: German Monastery, 31.V.1915, IB (1 f. NMNHS).

The record of NEDELKOV (1905: 18) at Dimitrovgrad (= Tsaribrod) is concerning contemporary Serbia. Fig. 7 shows the known finds of the taxon in Bulgaria including the locality near Dimitrovgrad.

Distribution: Central-South European.

Odonteus DEJEAN, 1821 (= *Odontaeus* auct.)

Odonteus armiger (SCOPOLI, 1772) (= *mobilicornis* FABRICIUS, 1775)

Odontaeus armiger: IOAKIMOV 1899: 8 (Rila Mts.); HORION 1958: 42 (Rila Mts.: Rila Monastery, Borovets); ZACHARIEVA-STOILOVA 1974: 128 (repeated older data); ZACHARIEVA, DIMOVA 1975: 188 (Western Rhodopes: Trigrad); BUNALSKI 2001: 166 (without exact data). *Odonteus mobilicornis*: IOAKIMOV 1904: 20 (Sofia Region: Sofia; Eastern Rhodopes: Haskovo env.); NEDELKOV 1905: 18 (Sofia Region: Sofia, 1 ex. rev., NMNHS). *Odontaeus dauricus*: ANONYMOUS 1907: 305 ("Bulgarie", 1 f. rev., NMNHS).

NEW DATA: Rila Mts.: "Rhodopes, Belovo", JM (1 ex. NMNHS); Rila Monastery, 1400-2000 m, 1.VIII.1977, DW (1 ex. CR). Maleshevska Mts.: W "Sveti Iliya" Monastery, 900 m, soil traps in *Querceto-Carpinetum* forest, 19.VI.-16.VII.2003, BG (1 ex. NMNHS). Western Rhodopes: Chepelare, 21.VII.1914, DEI (1 f. NMNHS);

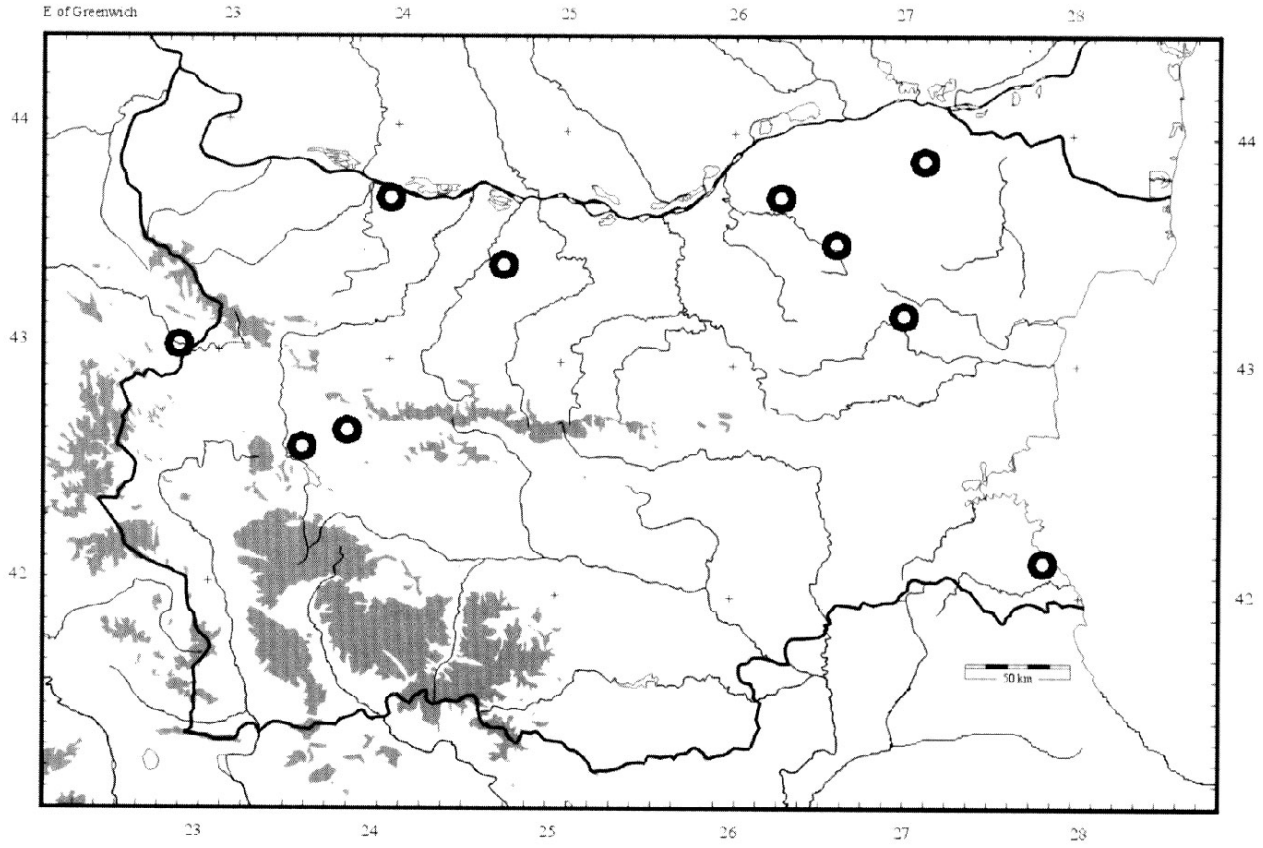


Fig. 7. Localities of Bolboceratidae in Bulgaria: European faunal element (*Bolbelasmus unicornis*, circles); the locality near Dimitrovgrad (East Serbia) is also included.

Polkovnik Serafimovo near Smolyan, 2.VII.1970 (1 f. NMNHS). Black Sea Coast: Varna, 11.V.1947, NK (2 ex. NMNHS); Vlas, 100 m, VIII.1982, PC (2 ex. CR); Primorsko, Arkutino Reserve, 18/19.VI.2001, at light (1 ex. CB).

Distribution: European.

GEOTRUPIDAE LATREILLE, 1802

GEOTRUPINAE LATREILLE, 1802

Anoplotrupes JEKEL, 1865

Anoplotrupes stercorosus (HARTMANN in L. G. SCRIBA, 1791) (= *sylvaticus* PANZER, 1798)

Geotrupes sylvaticus: IOAKIMOV 1904: 20; NEDELKOV 1905: 18. *Geotrupes stercorosus*: MIKŠIĆ 1957: 185; HORION 1958: 53 (Rhodopes); ANGELOV 1965: 101; ZACHARIEVA-STOILOVA 1974: 129. *Geotrupes stereorarius*!: ZACHARIEVA 1965a: 236; ZACHARIEVA-STOILOVA 1969: 18; ZACHARIEVA, DIMOVA 1975: 188; ZACHARIEVA *et. al.* 1975: 35; BARAUD 1992: 53. *Anoplotrupes stercorarius*: BUNALSKI 2000: 87; BUNALSKI 2001: 167.

Distribution: European.

Ceratophyus FISCHER VON WALDHEIM, 1820

Ceratophyus dauricus JEKEL, 1865

Odontaeus dauricus: ANONYMOUS 1907: 305 (material misidentified: *Odonteus armiger*, see above).

C. dauricus is known from the steppes of Central Asia and Mongolia (REITTER 1893). Another species of interest is *C. polycerus* (PALLIARDI, 1771), known from the steppe habitats east of the Dneper River, West Siberia and Kazakhstan (KRYZHANOVSKIJ 1965; MEDVEDEV 1965). Therefore no species of this genus could occur in Bulgaria.

Geotrupes LATREILLE, 1796

Geotrupes mutator (MARSHAM, 1802)

Geotrupes mutator: IOAKIMOV 1899: 8; IOAKIMOV 1904: 20; MARKOVICH 1904: 239; KOVACHEV 1905: 7; NEDELKOV 1905: 18; MARKOVICH 1909: 10; MIKŠIĆ 1957: 185; MUCHE 1964: 63; ANGELOV 1965: 100; DIMITROVA 1965: 356; DIMITROVA, TRIFONOV 1965: 49; ZACHARIEVA 1965a: 236; ZACHARIEVA 1965b: 143; ZACHARIEVA 1965c: 132; DIMITROVA 1966: 47-49, 52; TRIFONOV 1966: 1074; DIMITROVA, GENOV 1968: 81, 83; ZACHARIEVA-STOILOVA 1969: 18; ZACHARIEVA-STOILOVA 1974: 129; ZACHARIEVA, DIMOVA 1975: 188; ZACHARIEVA *et al.* 1975: 34; ZACHARIEVA-STOILOVA, DIMOVA 1981: 92; BUNALSKI 2001: 167.

Distribution: Central Asiatic-European.

Geotrupes spiniger (MARSHAM, 1802) (= *puncticollis* MALIM, 1811)

Geotrupes puncticollis: IOAKIMOV 1904: 20. *Geotrupes spiniger*: NEDELKOV 1905: 18; NEDELKOV 1909b: 97; NETOLITZKY 1912: 163; MIKŠIĆ 1957: 185; MUCHE 1964: 63. ANGELOV 1965: 100; DIMITROVA 1965: 356; DIMITROVA, TRIFONOV 1965: 49; TRIFONOV 1965: 50; ZACHARIEVA 1965a: 236; ZACHARIEVA 1965b: 143; ZACHARIEVA 1965c: 132; DIMITROVA 1966: 47-49, 52; TRIFONOV 1966: 1074; ZACHARIEVA-STOILOVA 1969: 18; ZACHARIEVA-STOILOVA 1974: 129; ZACHARIEVA, DIMOVA 1975: 188; ZACHARIEVA *et al.* 1975: 35; ZACHARIEVA-STOILOVA, DIMOVA 1981: 92; BUNALSKI 2001: 167.

Distribution: European- Turanian.

Geotrupes stercorarius (Linnaeus, 1758) (= *hypocrita* Illiger, 1803)
Geotrupes stercorarius: Hristovich 1892: 338; Ioakimov 1904: 20; Markovich 1904: 239; Kovachev 1905: 7; Nedelkov 1905: 18; Markovich 1909: 10; Angelov 1960: 22; Zacharieva-Stoilova 1969: 18; Zacharieva-Stoilova 1974: 129; Zacharieva *et. al.* 1975: 35; Bunalski 2000: 87; Bunalski 2001: 167. *Geotrupes hypocrita*: Ioakimov 1899: 8.

Distribution: Asiatic-European.

Jekelius López-Colón, 1989

subgenus *Jekelius* s. str.

Jekelius (*Jekelius*) *intermedius* (A. Costa, 1827)

(= *laevigatus* auct. nec Fabricius, 1798)

Thorectes laevigator!: Ioakimov 1899: 8. *Geotrupes levigatus*: Markovich 1909: 10; Zacharieva-Stoilova 1969: 19. *Geotrupes laevigatus*: Nedelkov 1905: 19; Nedelkov 1909b: 97. *Geotrupes intermedius*: Zacharieva-Stoilova 1969: 19. *Geotrupes impermedius*!: Guéorguiev *et al.* 1993: 297.

On the basis of the misidentified material under *J. punctulatus*, we conclude that all records of this West Mediterranean species from Bulgaria have to refer to the following species.

subgenus *Reitterius* López-Colón, 1989

Jekelius (*Reitterius*) *punctulatus* (Jekel, 1865) (= *brancsiki* Apfelbeck, 1890; ? *rhilensis* Tesař, 1935)

Geotrupes brancsiki: Reitter 1893: 153 (Central Stara Planina Mts.). *Thorectes laevigatus*: Ioakimov 1904: 20 (species misidentified: Sofia, 1 m., Kalofer, 1 f., NMNHS). *Thorectes intermedius*: Nedelkov 1909a: 34 (sub *Geotrupes laevigatus*, species misidentified: Sredna Gora, 2 ex. NMNHS). *Geotrupes punctulatus* v. *rhilensis*: Tesař 1935: 186 (Rila Mts.: Kostenets); Mikšić 1957: 151 (Vitosha Mts.: Knyazhevo), 185; Angelov 1965: 101 (Western Rhodopes: Yundola; Vitosha Mts.: Aleko; Central Stara Planina: Levski Hut). *Thorectes punctulatus*: Baraud 1993: 62, 72 (without locality); Král, Malý 1993: 21 (Vitosha Mts.: Kopitoto; Pirin Mts.: Vihren); Sakalian, Guéorguiev 1997: 50 (repeated old data); Bunalski 2000: 87 (Pirin Mts.: Orelek); Bunalski 2001: 167 (without locality). *Jekelius punctulatus*: López-Colón 1995: 367.

NEW DATA: Western Stara Planina: Vrachanska Mts., Chernite kamani locality, 850-900 m, 10.VI.1997, BG (1 ex. NMNHS). Central Stara Planina: Sara-Kaya, 1500 m, 5.VIII.1949, NK (2 ex. NMNHS); Botev Peak env. (= Yumruk Chal), 1400 m, 28.V.1951, VM (1 ex. NMNHS). Lyulin Mts.: 7.V.1939, IIL (1 ex. IZ). Vitosha Mts.: BAS holiday station, 1500-1600 m, 13.V.1953, NV (36 ex. NMNHS); Cherni Vrah, 1500-1600 m, 22.V.1959, RB (3 ex. CB); 1450 m, 4. IX. 1959, BB (1 f. CB); 29.IV.1962, MV (3 ex. sub *Geotrupes laevigatus* Fabricius, B. Zacharieva det., IZ); Momina skala - Ofeliite, 1500 m, 8.VII.2002, EM (1 ex. CM). Golo Bardo Mts.: 28.IV.1937, PD (1 ex. IZ); 11.V.1938, BA (1 ex. NMNHS); 21.V.1993, VGU (1 ex. NMNHS). Sashtinska Sredna Gora Mts.: Oborishte locality near Panagyurishte, 24.V.1961, MV (2 ex. sub *Geotrupes laevigatus* Fabricius, B. Zacharieva det., IZ). Osogovska

Mts.: "Kyustendil", 25.V.1910, DII (1 ex. NMNHS); Tash-Tepe Peak, 1990 m, the state border between Bulgaria and Macedonia, 21.VI.1926, NR (2 ex. NMNHS). Rila Mts.: Borovets (= Chamkoria), 15-25.VIII.1921, IB (1 ex. NMNHS); Rila Monastery, 1700 m, 10. VII. 1959, BB (1 f. CB); same locality, 1200- 2000 m, VII.1976, DW (1 ex. CR). Maleshevska Mts.: W Gorna Breznitsa, 1500 m, soil traps in beech forest, 1.V.-16.VII.2003, TL (1 ex. NMNHS); state border between Bulgaria and Macedonia, 1700 m, 3.VII.2003, TL (2 ex. NMNHS). Pirin Mts.: above Dobrinishte, 1500 m, 23.VII.1980, DW (4 ex. CR).

J. punctulatus is a mountain Balkan endemic species, which inhabit Bosnia, Herzegovina, Montenegro, Serbia and Bulgaria. It is present mostly in habitats above 1000 meters altitude. Tesař (1935) described var. *rhilensis* from Rila, but Mikšić (1957) doubt the validity of this form. Despite the uncertain status, Král, Malý (1993) supposed the populations from Vitosha and Pirin to belong to this variation, too. Hitherto it is noted from Central Stara Planina, Vitosha, Rila, and Pirin. Here the species is firstly cited from the mountains of Lyulin, Golo Bardo, Sashtinska Sredna Gora, Osogovo, and Maleshevska Planina.

Distribution: Balkan.

Trypocopris Motschulsky, 1858

subgenus *Pseudotrypocopris* Mikšić, 1955

Trypocopris (*Pseudotrypocopris*) *amedei* (Fairmaire, 1861)
Trypocopris amedei: Tesař 1935: 187 (Strandzha Mts.: Kalovo); Král, Malý 1993: 21 (Black Sea Coast: Arkutino); Bunalski 2000: 87 (Eastern Rhodopes: Dolno Cherkovishte).
Pseudotrypocopris amedei: Bunalski 2001: 167 (without exact data).

From the Balkans the species was cited from SE Bulgaria (Fig. 8), Greece and European Turkey (Mikšić 1957; Král, Malý 1993).

Distibution: South-East Balkan - Anatolian.

subgenus *Trypocopris* s. str.

Trypocopris (*Trypocopris*) *fulgidus* (Motschulsky, 1845)
Trypocopris fulgidus: Král, Malý 1993: 21 (Strandzha Mts.: Bosnia; Black Sea Coast: Bozhura Hut; Tsarevo); Bunalski 2001: 167 (without exact data).

NEW DATA: Sakar-Tundzha Region: Bakadzhitsi Hills, Golyam Bakadzhik, 24.IX.1906 (1 ex. NMNHS) / 28.VII.1912 (2 ex. sub *Trypocopris vernalis autumnalis* Ziegler! NMNHS), all DII. Sakar Mts.: 850 m, 26.V.1951, NA (1 ex. NMNHS). Strandzha Mts.: Kachul, 640 m, 25. VI. 1921, DEI (3 m. CB); Brodilovo, 31.V.1923 (1 ex. NMNHS) / Vizitsa, 1.VI.1923 (2 ex. NMNHS) / Kalovo, 1-7.VI.1923 (1 ex. NMNHS) / Murzhevo, 1-7.VI.1923 (1 ex. NMNHS) / Panicharevo, 5.VI.1923 (2 ex. NMNHS), all DEI; Valchi Most, 3.VIII.1935, PD (1 ex. NMNHS); Vizitsa, 1.VII.1960, ASZ (2 m. CB). Black Sea Coast: 4 km SW Primorsko, Karaagach River, 26.VIII.2004, BG (1 ex. NMNHS).

In Europe the species is known only from SE Bulgaria and European Turkey (Mikšić 1957: 148). In Bulgaria it lives in the Bakadzhitsi Hills, the Sakar Mts., the Strandzha Mts., the adjacent coastal regions (Fig. 8), and probably the Dervent Hills.

Distribution: South-Eastern Balkan - Anatolian.

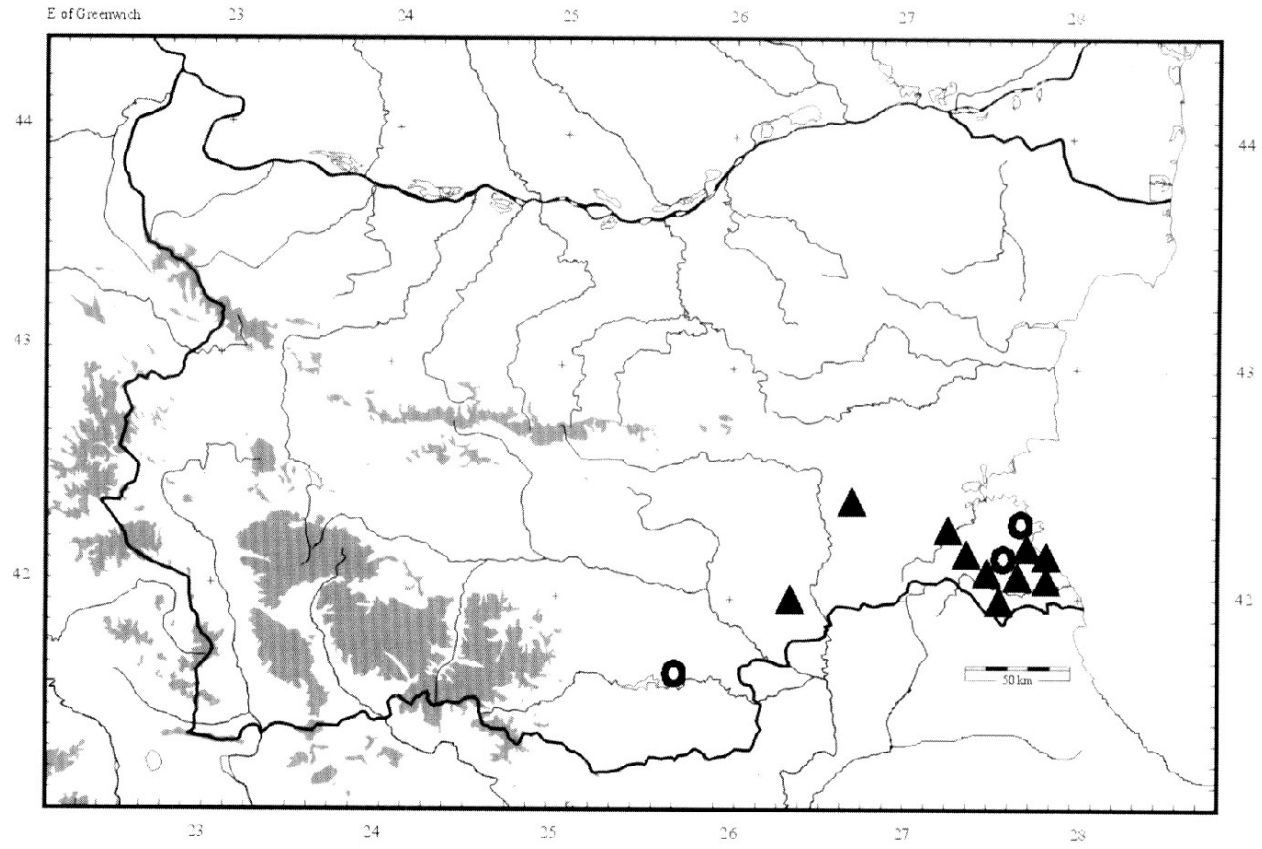


Fig. 8. Localities of Geotrupidae in Bulgaria: two Anatolian faunal elements (*Trypocopris amedei*, circles and *T. fulgidus*, triangles).

Trypocopris (*Trypocopris*) *vernalis* (Linnaeus, 1758) (= *autumnalis* Heer, 1840; *obscurus* Mulsant, 1842; *balcanicus* Reitter, 1893)
Geotrupes vernalis var. *balcanicus*: Reitter 1893. *Trypocopris vernalis*: Ioakimov 1899: 8. *Geotrupes vernalis*: Ioakimov 1904: 20; Markovich 1904: 239; Kovachev 1905: 7; Nedelkov 1905: 18-19 (sub forma typica, var. *balcanicus*, var. *obscurus*); Markovich 1909: 10; Nedelkov 1909b: 97; Netolitzky 1912: 163; Drenski 1934: 117; Panin 1941: 554; Csiki 1943: 215; Mikšić 1957: 148, 185; Horion 1958: 54; Angelov 1965: 101; Dimitrova, Trifonov 1965: 49-51; Zacharieva 1965a: 236; Zacharieva 1965c: 132; Trifonov 1966: 1074; Zacharieva-Stoilova 1969: 18; Zacharieva-Stoilova 1974: 129; Zacharieva, Dimova 1975: 188; Bunalski 2001: 167. *Geotrupes splendens* Erichson, 1847 (syn. of *Trypocopris pyrenaeus* Charpentier, 1825): Anonymous 1907: 305. *Trypocopris vernalis vernalis*: Baraud 1992: 78.

The Bulgarian populations belong to the nominotypical subspecies (Baraud 1992: 78). Distribution: European.

Typhaeus Leach, 1815 (= *Typhoeus* auct.)

Typhaeus fossor Waltl, 1838
Teuchestes fossor: Ioakimov 1899: 8. *Ceratophyus fossor*: Nedelkov 1905: 18 (Stara Zagora, 1 m. rev., NMNHS); Dimitrova 1965: 356; Dimitrova, Trifonov 1965: 49-51; Zacharieva 1965b: 143; Zacharieva 1965c: 132 (Eastern Rhodopes: Krumovgrad, 1 m. rev., IZ); Dimitrova, Genov 1968: 81. *Ceratophius*! *fossor*: Dimitrova 1966: 47-49 (Strandzha Mts., Belila, 8 m., 12 f., rev., IZ; Black Sea Coast, Yasna Polyana, 5 m., 3 f. rev., IZ). *Typhoeus fossor*: Angelov 1965: 100; Zacharieva-Stoilova 1974: 128;

ZACHARIEVA *et. al.* 1975: 34; ZACHARIEVA-STOILOVA, DIMOVA 1981: 92 (Middle Struma Valley, Drangovo, 12 m., 10 f., rev., IZ); BUNALSKI 2001: 167.

NEW DATA: Middle Struma Valley: Blagoevgrad (= Gorna Dzhumaya), 10.V.1930, NF (1 m. NMNHS); Kresna Gorge, 8.V.1921, IB (1 f., NMNHS). Strandzha Mts.: Malko Tarnovo, 3-5.V.1921, PP (1 m., NMNHS); same locality, V.1958, AP (1 m. IZ). Black Sea Coast: Ahtopol, 7.V.1958, BPS (1 ex., CB).

The known localities of *T. fossor* in Bulgaria are shown on Fig. 9, including the misidentified record of MUCHE (1964) for the next taxon. The record from the Rila Mts. (IOAKIMOV 1899) is quite unreliable. Probably it concerns misidentified material of other species and therefore it is omitted on Fig. 9.

Distribution: East Mediterranean.

Typhaeus typhoeus (LINNAEUS, 1758)

Typhaeus typhoeus: MUCHE 1964: 63 (Nessebar env.).

MUCHE (op. cit.) considered a single male found near Nessebar belonging to this West European species. However, based on the study of 15 males from the Burgas District (see above), we consider that this species does not occur in Bulgaria. HORION (1958: 46) noted explicitly that east of Croatia, in the Balkan Peninsula, *T. typhoeus* is replaced by *T. fossor*.

LETHRINAE MULSANT, REY, 1871

Lethrus SCOPOLI, 1777

subgenus *Lethrus* s. str.

Lethrus (*Lethrus*) *apterus* (LAXMANN, 1770) (= *cephalotes* auct. nec PALLAS, 1771)

Lethrus cephalotes: REITTER 1890: 290; IOAKIMOV 1904: 20; MARKOVICH 1904: 239; KOVACHEV 1905: 7; NEDELKOV 1905: 19; ANONYMOUS 1907: 305; MARKOVICH 1909: 10; TSCHORBADJIEV 1926: 35; DRENSKI 1931: 21; IOAKIMOV 1931: 24. *Lethrus apterus*: NEDELKOV 1909a: 34 (Lom, 2 ex. rev. NMNHS; Pleven, 1 ex. rev., NMNHS; Provadia, 2 ex. rev., NMNHS, 1 ex. rev., IZ); TSCHORBADJIEV 1930: 99; BURESCH, LAZAROV 1956: 191; МИКЪИЖ 1957: 185; ANGELOV 1960: 22; ANGELOV 1965: 101; ZACHARIEVA 1965a: 236; ZACHARIEVA-STOILOVA 1969: 19; ZACHARIEVA-STOILOVA 1974: 129; ZACHARIEVA, DIMOVA 1975: 188; BARAUD 1992: 83; KODZHABASHEV, PENEV 1998: 78; BUNALSKI 2000: 87; BUNALSKI 2001: 167. *Lethrus elephas*: NEDELKOV 1909a: 34 (species misidentified: Sliven, 1 ex. NMNHS).

NEW DATA: South Dobrudzha: Gora Karakus Reserve, 12.VI.1952, PD (1 ex. NMNHS). Black Sea Coast: Pomorie (= Mesemvria), 27.V.1940 (1 ex. NMNHS); Varna, 1.IV.1942 (15 ex. NMNHS) / 24.IV.1944 (1 ex. NMNHS) / 2.IV.1950 (2 ex. NMNHS), all NK.

BURESCH, LAZAROV (1956) enumerated also many localities for the species in their review on the pest insects from Bulgaria.

Distribution: Central-South European.

{*Lethrus* (*Lethrus*) *ares* KRÁL, REJSEK, SCHNEIDER, 2001. This species is described and known for the present only from the Evros District (Greek Thrace) bordering the Bulgarian territory. It could inhabit border sections of the Bulgarian Eastern Rhodopes below 400 meters altitude. KRÁL *et al.* (2001) stated the records of *L. rotundicollis* FAIRMAIRE, 1866 for Greece (BARAUD 1992: 82) refers to this species. No doubt the record of MIKŠIĆ (1957: 186 sub *L. rotundicollis*) for European Turkey also has to be

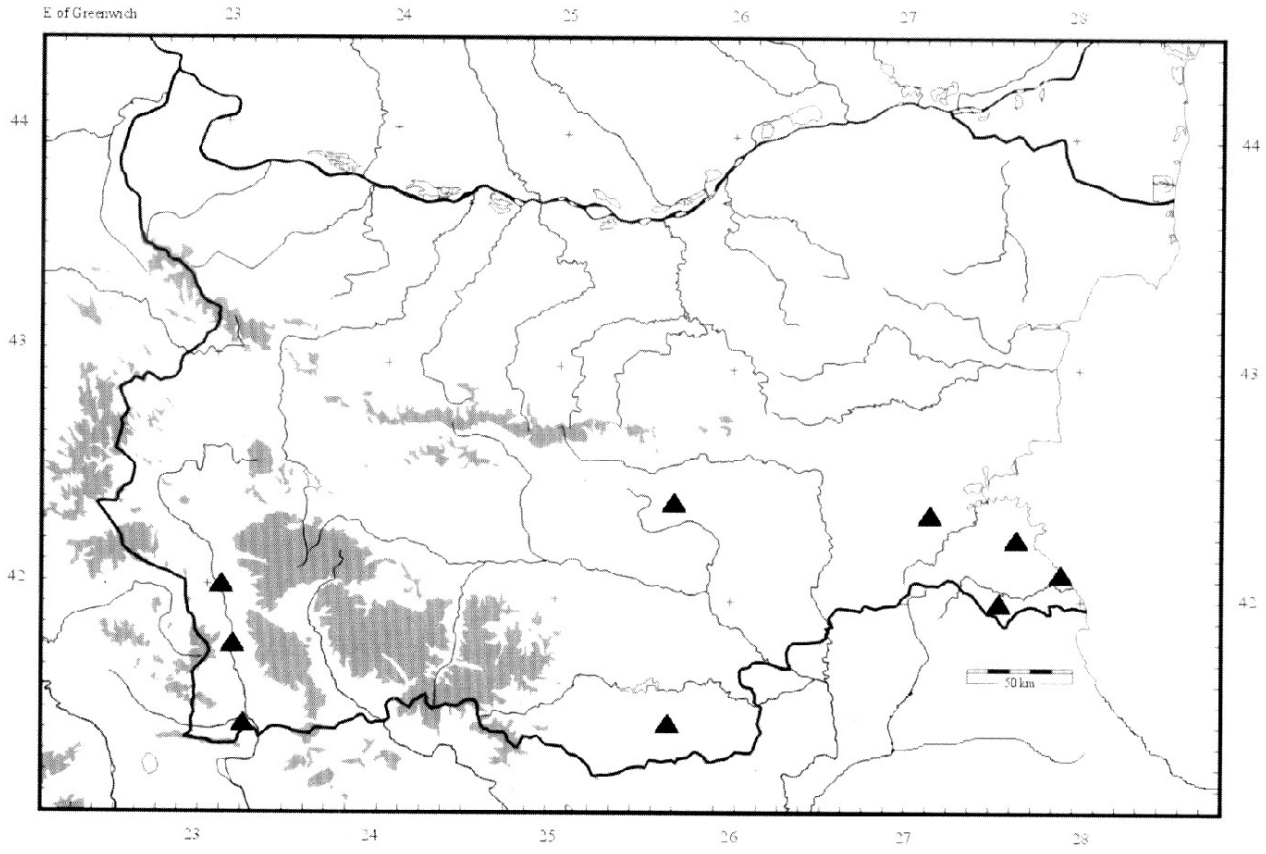


Fig. 9. Localities of Geotrupidae in Bulgaria: East Mediterranean faunal element (*Typhaeus fossor,* triangles).

referred to *L. ares* (O. Hillert, personal communication). Distribution: Balkan (regional).}

 # Lethrus (*Lethrus*) *elephas* Reitter, 1890 (= *mandibularis* B. Jakovlev, 1892)
Lethrus elephas: Nedelkov 1909a: 34, note 1; Zacharieva-Stoilova 1974: 129; Bunalski 2001: 167.

Part of the material cited in Nedelkov (1909a) was found and revised. In fact, it concerns the species *L. apterus* and *L. schaumii* (see under each of two taxa). Zacharieva-Stoilova (1974) repeated the Nedelkov's data. Bunalski (2001) put *L. elephas* correctly among the misidentified or problematic taxa for Bulgaria. Mikšić (1957: 186 sub *L. mandibularis*) listed it among the scarabs known from European Turkey. However, O. Hillert (personal communication) wrote us: "*Lethrus elephas* is described from "Turkey", but in 1890 the territory of Turkey was including completely the northern parts of Greece. It lives in Greece near the borders of Macedonia and Albania. In my opinion it is not possible to found *L. elephas* from Bulgaria...". Distribution: Balkan (regional).

{*Lethrus* (*Lethrus*) *fallax* Nikolajev, 1975. This species is hitherto known from European Turkey ("Port Baklar", Edirne, Kesan, Istanbul) and the adjacent area of Asia - "Dardanellen, Asian" (Nikolajev 1975: 148). In fact, one of those localities, e.g. Edirne (= Odrin), is collected not more than 20 km from the Bulgarian territory. According to O. Hillert (personal communication), the mentioning of *L. brachiicollis* Fairmaire, 1855 (Mikšić 1957: 186) for European Turkey actually refers to *L. fallax*. Distribution: Balkan (regional).}

Lethrus (*Lethrus*) *raymondi* REITTER, 1890
Lethrus raymondi: MIKŠIĆ 1957: 186 (without exact data); BUNALSKI 2001: 167 (without exact data).

NEW DATA: Middle Struma Valley: Levunovo, 2.VI.1953, BZ (1 ex. NMNHS); Drangovo, 22.IV.1976, BZ (24 ex. IZ); Sandanski, 12-14.VI.1987, ASL (1 m. IZ); Pchelina Hill south of Levunovo, 4.V.2002, EM (18 ex. CM); SE slope of Sveti Iliya Hill near Kalimantsi, 450-500 m, 10-11.V.2002, EM (1 ex. CM); north of Katuntsi, 350 m, 12.V.2002, EM (1 ex. CM).

Recently KRÁL *et al.* (2001) stated that this species is confined to the valleys of the Vardar River and the Struma River, on territories situated in Macedonia, SW Bulgaria, and N Greece. For this reason the species' mentioning by ANGELOV (1965) and BARAUD (1992) from the Thracian Lowland is referred to the next taxon. The identification of Prof. Dr. D. Král included here is the first proved evidence for the species' occurrence in Bulgaria.

Distribution: Balkan (regional).

Lethrus (*Lethrus*) *schaumii* REITTER, 1890 (= *forcipatus* B. JAKOVLEV, 1892)
Lethrus schaumii: REITTER 1890: 293 ("Rumelien", loc. typ.); NEDELKOV 1905: 19 (Thracian Lowland: Stara Zagora, 1 m. rev., CR, 1 f. NMNHS, Chirpan, "Rumelia"; East Rhodopes: Haskovo, 1 m. rev., NMNHS); NIKOLAJEV 1975: 147 ("Rumelien").
Lethrus raymondi: ANGELOV 1965: 101 (Thracian Lowland: Plovdiv); BARAUD 1992: 82 ("Roumélie").

NEW DATA: Thracian Lowland: Stara Zagora, 1905 (1 ex. NMNHS) / 1906 (1 ex. NMNHS) / 1908 (4 ex. NMNHS), all NN.

As a result of the revision of previously cited material (NEDELKOV 1905: 19), in the year 1909, NEDELKOV (1909a: 34, note 1) referred the identification of *L. schaumii* to *L. elephas*. Part of this material was found out and revised again by Prof. Dr. D. Král. He ascertained that the first Nedelkov's determination was right. *L. schaumii* was described from "Asia Minor" and "Rumelia". However, the real species' distribution is confined only to a part of the Bulgarian Thracian Lowland, conditionally centered between the cities of Stara Zagora, Plovdiv and Haskovo. Species confirmed for Bulgaria.

Distribution: Balkan (regional).

HYBOSORIDAE ERICHSON, 1847

Hybosorus MACLEAY, 1819

Hybosorus illigeri REICHE, 1853
Hybosorus illigeri: NEDELKOV 1905: 18 (Thracian Lowland: Sadovo, 6 ex. rev. NMNHS); ANONYMOUS 1907: 305 (Black Sea Coast: Varna, 3 ex. rev., other 2 ex. without head and pronotum NMNHS); MIKŠIĆ 1957: 185 (without exact data); BARAUD 1992: 87 (without exact data); BUNALSKI 2001: 167 (without exact data).

NEW DATA: Black Sea Coast: Vlas, 17-26.VII.1983, DW (1 ex. CR); Sozopol, VII.1976, DW (1 ex. CR).

Distribution: South Europe, Caucasus, SW Asia, Africa, North America (USA, Mexico, Bahamas, Haiti, Cuba).

OCHODAEIDAE MULSANT, REY, 1871

OCHODAEINAE MULSANT, REY, 1871

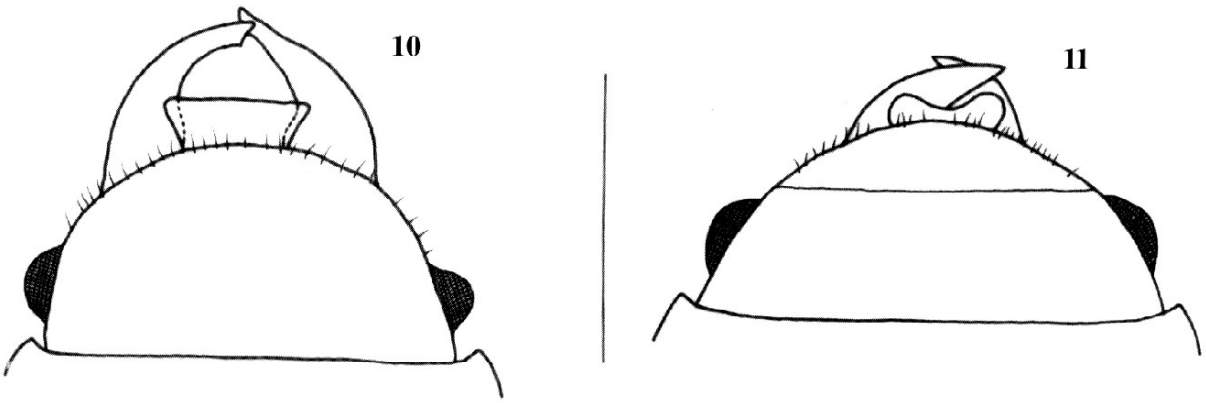
* *Codocera* ESCHSCHOLTZ, 1818

* *Codocera ferrugineus* ESCHSCHOLTZ, 1818 (= *crucirostris* FISCHER VON WALDHEIM, 1823)

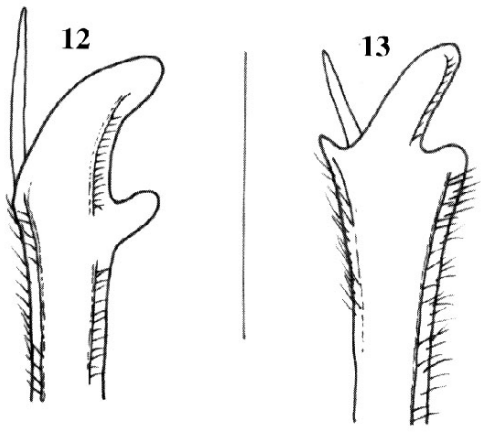
MATERIAL STUDIED: Black Sea Coast: Varna, 1.VII.1950, NK (1 f., rev., NMNHS).

Codocera is a monotypic genus that can be distinguished from another Palaearctic genus of the family - *Ochodaes*, by the longer and more projecting forward mandibles of the males, the labrum with anterior margin not concave (Figs. 10-11), and the inner angle of protibiae without protuberance at tip (Figs. 12-13). *C. ferruginea* is confined to the steppe and semidesert biomes of SE Europe, Kazakhstan, Uzbekistan, South Siberia, Mongolia, NE China, and the Far East (KRYZHANOVSKIJ 1965; NIKOLAJEV 1989). In South-East Europe it is known from single localities in East Austria, Hungary, Slovakia, Bosnia, Serbia, Banat (MIKŠIĆ 1957; HORION 1958) and Dobrudzha (ANONYMOUS 1907: 305 sub *Ochodaeus crucirostris*; without specification of state).

Distribution: Asiatic-European (steppe).



Figs. 10-11. Dorsal aspect of head: *Codocera ferruginea* (Fig. 10), *Ochodaeus integriceps* (Fig. 11). Scale line = 0.1 mm.



Figs. 12-13. Dorsal aspect of right protibia: *Codocera ferruginea* (Fig. 12), *Ochodaeus integriceps* (Fig. 13). Scale line = 0.1 mm.

Ochodaeus DEJEAN, 1821

Ochodaeus chrysomeloides (SCHRANK, 1781) (= *clypeatus* MOTSCHULSKY, 1859)

Ochodaeus chrysomeloides: NETOLITZKY 1912: 163 (Central Stara Planina: Shipka Mts.); ROUBAL 1931: 453 (Maleshevska Mts.: Gorna Breznitsa); HORION 1958: 176 ("Sistovo"); BUNALSKI 2000: 87, 90 (East Rhodopes: Dolno Cherkovishte, 1 ex. rev. CB); BUNALSKI 2001: 167 (without exact data); GUÉORGUIEV 2001: 171 (repeated older data).

NEW DATA. Western Rhodopes: Byala Cherkva, 15.V.1936, IB (1 m., NMNHS). Black Sea Coast: Varna, 11.VII.1948, NK (1 f., NMNHS); Vlas, 18-26.VII.1982, DW (1 ex. CR).

This species was cited from Dobrudzha (ANONYMOUS 1907: 305 sub *O. clypeatus*) without

specification of the state. The male individual from the Western Rhodopes is too large (7,4 mm with mandibles), if compared with the data of BARAUD (1992), e.g. between 3 and 6 mm. The same specimen has deeper incision on the front edge of the clypeus. Probably, the local population in the Rhodopes represents separate geographical form, but more material is needed until the identity of that can be settled.

Distribution: Central-South European.

* *Ochodaeus cornifrons* SOLSKY, 1876 (= *alleonis* FAIRMAIRE, 1884)

MATERIAL STUDIED: Middle Struma Valley: place Rupite near the Kozhuh Hills, a street to the home of Baba Vanga, 3.V.2002, EM (1 ex. CM).

The occurrence of *O. cornifrons* in SW Bulgaria is surprising and the locality there is the westernmost known in the species' range. It was cited for Dobrudzha (ANONYMOUS 1907: 305 sub *O. alleonis* sp.n., Dobrudzha, 1 ex. rev., NMNHS) without specification of the state. Later, ARROW (1912: 21) noted the species only for Romania, from that we infer the type locality of *alleonis* is situated in the Romanian Dobrudzha. However, NIKOLAJEV (1987: 130) synonymized *O. alleonis* with *O. cornifrons*.

Distribution: Turano - Pontic.

Ochodaeus integriceps SEMENOV, 1891

Ochodaeus integriceps: BUNALSKI 2000: 87, 90 (Middle Struma Valley: Kozhuh Hills; Eastern Rhodopes: Dolno Cherkovishte); BUNALSKI 2001: 167 (without exact data).

NEW DATA: Maleshevska Mts.: W Gorna Breznitsa, 780-800 m, soil traps in ecotone habitat (*Platanus orientalis* / meadow), 14.VI.- 9.VII.2002, BG (1 ex. NMNHS); E Gorna Breznitsa, 330-340 m, soil traps in oak forest, 16.VI.-11.VII.2002, BG (1 ex. NMNHS); SE Tsaparevo, 480 m, soil traps, 2-30.VII.2002, SL / TL (2 ex. NMNHS).

Distribution: South-East European (Moravia, South Bulgaria, Caucasus) - Anatolian (Asia Minor, Armenia).

Ochodaeus thalycroides REITTER, 1893

Ochodaeus thalycroides: BUNALSKI 2001: 167 (Pirin Mts.: Sugarevo; Western Rhodopes: Assenovgrad env.; Black Sea Coast: Arkutino Reserve).

NEW DATA: Prof. D. Král (personal communication) identified 1 m. from the Kozhuh Hills, the Middle Struma Valley. Having chance to compare this male with the type and other material from Macedonia (Doiran Lake) and Greece, he has noted that the species is distincted from *O. chrysomeloides* by the small incision of the anterior margin of clypeus and by the different punctuation of elytra. Species confirmed for Bulgaria.

Distribution: Balkan (South Bulgaria, Greece, European Turkey).

Conclusions

In Bulgaria family Lucanidae includes six genera with eight species, Bolboceratidae – two genera with two species, and Glaresidae and Hybosoridae – single genus with single species each of them. The occurrence of some further species from the four aforementioned families in the country is almost unlikely. Family Trogidae consists of single genus *Trox* and five reliably cited species, from which *T. perrisi* is desirable to be confirmed again. *T. eversmannii*, cited for Bulgaria one century ago, needs cogent confirmation. On the other hand, most likely, *T. cadaverinus* and *T. transversus* will be found in Bulgaria.

Geotrupidae is the biggest family among other treated here and comprises six genera with twelve species. Genus *Ceratophyus* and the species *C. dauricus*, *Jekelius intermedius* (= *laevigatus*), *Typhaeus typhoeus* and *Lethrus elephas* were noted, the second taxon more frequently than others, to inhabit Bulgaria. After revision of the respective materials or references these taxa are decidedly excluded from the list of the Bulgarian beatles. The species *L. ares* and *L. fallax*, noted in immediate proximity with the Bulgarian territory, probably will be found inside Bulgaria. This is also the family that hides probable taxonomic surprises, having in mind especially the genera *Jekelius* and *Lethrus*. Until recently the specialists paid little attention to family Ochodaeidae not only in Bulgaria. The group is represented here with two (one monotypic) genera and five species. It is desirable that the taxonomic and faunistic investigations on all these small but interesting family in Bulgaria have to be extended.

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Критичен преглед на семейства Glaresidae, Lucanidae, Trogidae, Bolboceratidae, Geotrupidae, Hybosoridae и Ochodaeidae в България (Coleoptera: Scarabaeoidea)

Б. Георгиев, М. Буналски

(Резюме)

Работата представлява принос към фаунистиката и таксономията на седем семейства скарабеидни бръмбари от България. Тя включва нови фаунистични данни, ревизия на публикуван материал и критичен преглед на литературата. Тридесет и четири вида от Glaresidae, Lucanidae, Trogidae, Bolboceratidae, Geotrupidae, Hybosoridae и Ochodaeidae обитават страната. Род *Codocera* и видовете *Platycerus caprea*, *Codocera ferruginea* и *Ochodaeus cornifrons* се съобщават за първи път. Потвърдено е присъствието на *Dorcus peyroni*, *Ceruchus chrysomelinus*, *Trox sabulosus*, *Lethrus raymondi*, *L. schaumii* и *Ochodaeus thalycroides*. Видът *Trox eversmannii* се нуждае от потвърждение. Род *Ceratophyus* и четири вида са изключени от фауната на България, докато други четири вида могат да обитават страната. Представени са подходящи белези за различаване на близките видове, като са предложени нови такива за видовете от род *Dorcus*.