






Research article

New and rare species of Cryptophagidae, Latridiidae and Mycetophagidae (Insecta: Coleoptera) for the fauna of Bulgaria

Borislav Guéorguiev¹, Gergana Zaemdzhikova², Plamen Glogov³, Alexandar Guéorguiev⁴

(1) National Museum of Natural History, Bulgarian Academy of Sciences, 1 Tsar Osvoboditel Blvd, 1000 Sofia, Bulgaria, gueorguiev@nmnhs.com ; <https://orcid.org/0000-0002-8532-0657> 

(2) Forest Research Institute, Bulgarian Academy of Sciences, 132 St. Kliment Ohridski Blvd, 1756 Sofia, Bulgaria, zaem.bg@abv.bg ; <https://orcid.org/0000-0002-0694-4331> 

(3) Forest Research Institute, Bulgarian Academy of Sciences, 132 St. Kliment Ohridski Blvd, 1756 Sofia, Bulgaria, plglogov@abv.bg ; <https://orcid.org/0000-0003-2913-3379> 

(4) Krasna polyana-1 Residential Quarter, Rumyana Street, Building 24, Sofia, Bulgaria

Abstract: *Cryptophagus intermedius* Bruce, *Dienerella filiformis* (Gyllenhal) and *Melanophthalma rhenana* Rücker et Johnson, 2007 are first time recorded for the fauna of Bulgaria as the first and third species are also first noted from the Balkan Peninsula. Left unmentioned for the country in the latest catalogues, but earlier noted in other announcements, other two species, *Berginus tamarisci* Wollaston and *Melanophthalma taurica* (Mannerheim) are confirmed for Bulgaria, with first detailed data reported. All the aforementioned species (except *C. intermedius*) have been reared and thus first time reported from the European mistletoe (*Viscum album* Linnaeus). A checklist of the Bulgarian hairy fungus beetles including new and republished data is presented too.

Keywords: beetles, Bulgaria, European mistletoe, first and new country records

Introduction

European mistletoe, *Viscum album* L., is an evergreen hemiparasitic shrub, growing on different woody hosts (Kahle-Zuber, 2008). In Bulgaria, the species is found all over the country from sea level to 2000 m.a.s.l. (Assyov et al., 2012). Three subspecies of European mistletoe are known to parasitise different hosts: *V. album* ssp. *album* L. (mostly on deciduous trees), *V. album* ssp. *austriacum* (Wiesb.) Vollm. (on representatives of genus *Pinus*), *V. album* ssp. *abietis* (Wiesb.) Abrom. (parasitic principally on *Abies*). Comparatively few insects have been recorded on all the European subspecies of mistletoe. In the continental Europe are recorded 81 insect species – Hemiptera (34), Coleoptera (27), the rest being mainly Diptera (5), Hymenoptera (8) and Lepidoptera (7). Of these 34 were recorded on European mistletoe in Britain (Thomas et al., 2023). Until now, the insects

on the fruits of *V. album* have not been the subject of research purposes in the country.

On the other hand, still there are poorly known and little investigated groups of beetle in Bulgaria. Among them are the representatives of families Cryptophagidae and Latridiidae, which recent acquisitions initiated this study.

Material and methods

The object of study are populations of European mistletoe (*Viscum album* ssp. *album*) in pure and mixed 25-year-old artificial plantations of black locust (*Robinia pseudoacacia* L.) on the territory occupied by sand dunes close to Nesebar Town, the Black Sea Region (Fig. 1). The study area is part of the protected area BG0000574 Aheloy – Ravda – Nesebar from the NATURA 2000 ecological network.



Fig. 1. New habitat of *Dienerella filiformis*, *Melanophthalma rhenana*, *M. taurica* and *Berginus tamarisci* – fruits of European mistletoe (top left) on plantations of black locust near Nesebar Town, Bulgaria.



Fig. 2. Habitat of *Cryptophagus reflexicollis*, spruce forest above Osogovo Hut, Bulgaria.

The samples – 123 fruits of *V. album* ssp. *album*, were collected of 9.04.2023 from 10 black locust trees in a sample area 50×50m in size. The collected fruits were transported to the laboratory of the Forest Research Institute at the Bulgarian Academy of Sciences, where they were placed in plastic box with ventilation holes. The samples were stored at room temperature between 18–20°C and natural light. They were checked daily for the emergence of insect adults. All emergence adults of beetles – 5 specimens were put individually in the tubs with 95% ethanol and handed over for identification to the first author.

The material collected at the Osogovo Mts was caught in a predetermined monitoring plot for collecting live beetles (see also Bekchiev et al., 2022). Performing the procedure, 12 soil traps arranged in a rectangle-shape (3×4) were exposed for 24 hours in a spruce forest (*Picea abies* (L.) H. Karsten) (Fig. 2).

All the material of Coleoptera included in the study has been determined by the first author and preserved in the entomological collection of the National Museum of Natural History in Sofia.

Results and discussion

Coleoptera Linnaeus, 1758

Cryptophagidae Kirby, 1837

Cryptophagus Herbst, 1792

Cryptophagus intermedius Bruce, 1934

Locality: Osogovo Mts, above Osogovo Hut, N42.19811° E22.62251°, 1650 m.a.s.l., pitfall traps, 14–15.09.2022, 1 specimen, leg. B. Guéorguiev, A. Guéorguiev.

Notes: Specimen with length of body 2.05 mm and a convex pronotum having proportion width/length = 1.63 (Fig. 3). Other external characters well-coincides with the species re-description (Otero & Johnson, 2013).

Distribution: According to Otero (2013) and Otero & Johnson (2013), *C. intermedius* occurs in Europe (Austria, Denmark, Estonia, France, Great



Fig. 3. *Cryptophagus intermedius* – specimen from Osogovo Mts, Bulgaria. Scale bar 0.5 mm.



Fig. 4. *Dienerella filiformis* – specimen reared from fruits of *V. album* ssp. *album*. Scale bar 0.5 mm.

Britain, Germany, Italy, Norway, Poland, Romania, Slovakia, South of Russia, Spain, Sweden, Switzerland), Caucasus (Azerbaijan, Armenia, Georgia) and Iran. The record from the Osogovo Mts is the first species mention from Bulgaria and the Balkan Peninsula.

Latridiidae Erichson, 1842

Dienerella Reitter, 1911

Notes: For the time being, 3 species of the genus are noted from Bulgaria – *D. anatoliaca* (Mannerheim, 1844), *D. clathrata* (Mannerheim, 1844) and *D. ruficollis* (Marsham, 1802) (Johnson, 2007; Rucker, 2013). Below down a fourth species is first reporting for the country.

Dienerella filiformis (Gyllenhal, 1827)

Locality: Nesebar Town, N42.64979° E27.70904°, 16 m.a.s.l., reared from fruits of *V. album* ssp. *album*, collected fruits 9.04.2023, adult emergence

30.04.2023, 1 specimen (Fig. 4), leg. G. Zaemdzhikova, P. Glogov.

Melanophthalma Motschulsky, 1866

Notes: In the recent catalogues and databases (Johnson, 2007; Rucker, 2013; Rucker & Johnson, 2013; Rucker, 2020), four species of the genus have been noted from Bulgaria – *M. extensa* Rey, 1889, *M. pallens* (Mannerheim, 1844), *M. sericea* (Mannerheim, 1844), and *M. transversalis* (Gyllenhal, 1827). A fifth species, *M. taurica* (Mannerheim, 1844) was also cited but without concrete data (Rucker, 1982). In spite of that notice, the last species has not been mentioned for the country in the latest catalogue of Latridiidae (Rucker, 2020).

Melanophthalma rhenana Rucker & Johnson, 2007

Locality: Same data as for *Dienerella filiformis*. One male specimen collected.

Notes: Male specimen of the “*taurica*” species groups (Rucker & Johnson, 2013), with length of



Fig. 5. *Melanophthalma rhenana* – male specimen reared from fruits of *V. album* ssp. *album*. Scale bar 0.5 mm.



Fig. 6. *Melanophthalma rhenana* – median lobe of aedeagus: left lateral view (left), ventral view (right). Scale bar 0.1 mm.



Fig. 7. *Melanophthalma taurica* – female specimen reared from fruits of *V. album* ssp. *album*. Scale bar 0.5 mm.

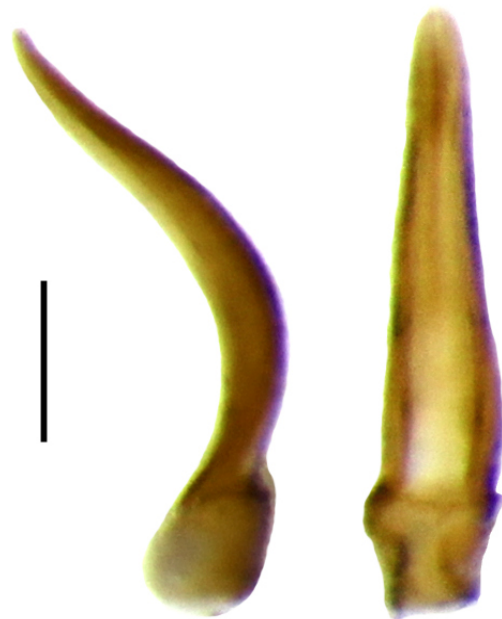


Fig. 8. *Melanophthalma taurica* – median lobe of aedeagus: left lateral view (left), ventral view (right). Scale bar 0.1 mm.

body 1.6 mm, antenna with 3-lobed club, first abdominal ventrite with lateral lines, front tibia without tooth and segment 3 of the fore tarsi with a pointed tooth bent forward (Fig. 5). Median lobe of

aedeagus with a long conspicuous flagellum protruding from the basal orifice (Fig. 6).

Distribution: Until presently the species was known from Germany, Austria, Czech Republic,

Slovakia, Turkey and Iran (Mika, 2023). The record near the Nesebar Town is the first one from Bulgaria and from the Balkan Peninsula.

Melanophthalma taurica (Mannerheim, 1844)

References: Rucker (1982: 80).

Locality: Same data as for *Dienerella filiformis*. One male and one female collected.

Notes: Larvae of the two species of the genus were found to live in sympatry in fruits of *V. album* ssp. *album*. Their imagoes are easily recognised one from another after a careful examination – this of *M. taurica* have lighter coloured, laterally more rounded elytra (Fig. 7) whereas that of *M. rhenana* have darker elytra with sides more parallel (Fig. 5). As well, the median lobe of aedeagus of the former species is less bent ventrally and without flagellum (Fig. 8). Except the above two characters, the male sex of *M. taurica* has the same combination of principal morphological features as that of *M. rhenana* (see “Notes” under *M. rhenana*).

Distribution: According to Rucker (2013) and Rucker & Johnson (2013), it occurs in Ukraine, South European Russia (Caucasus), Azerbaijan, Asiatic Turkey, Iran, Tajikistan, and Afghanistan, but absent from the Balkan Peninsula and Central Europe. The species is here noted with first detailed record from Bulgaria.

Mycetophagidae Leach, 1815

Notes: A checklist of the hairy fungus beetles from Bulgaria is prepared.

Mycetophaginae Leach, 1815

Litargus Erichson, 1846

Litargus (Litargus) connexus (Geoffroy, 1785)

References: Markovich (1909: 8); Guéorguiev & Ljubomirov (2009: 254); Háva (2021: 12); Háva (2022: 300).

Republished data by Guéorguiev & Ljubomirov (2009): Maleshevska Planina Mt, west of Gorna Breznitsa Village, 600–800 m.a.s.l., 1.05.2003, shifting litter, 1 specimen, leg. B. Guéorguiev.

Mycetophagus Fabricius, 1792

Mycetophagus (Ilendus) multipunctatus Fabricius, 1792

References: Joakimov (1904: 17); Háva (2022: 305).

Mycetophagus (Mycetophagus) quadripustulatus (Linnaeus, 1760)

References: Joakimov (1904: 38 sub *Tritoma quadripunctata* sic!); Netolitzky (1912: 160); Guéorguiev & Ljubomirov (2009: 254); Guéorguiev (2011: 13); Háva (2022: 307).

New data: Lyulin Mt, Karlezha Place, 6.10.1946, 1 specimen, leg. S. Bocharov; Sredna Gora Mts, Buzovgrad Village, 8.06.1948, 3 specimens, leg. S. Bocharov; Konyavska Planina Mt, Zemen Railway Station – Zemen Monastery, 6.06.1954, 3 specimens, leg. S. Bocharov; Belasitsa Mt, near Samuilovo Village, 450–500 m.a.s.l., 5.12.2009, *Platanus orientalis* L. forest, 2 specimens, leg. B. Guéorguiev.

Republished data by Guéorguiev & Ljubomirov (2009) and Guéorguiev (2011): Maleshevska Planina Mt, SW Sedelets Village, 680 m.a.s.l., 16.04–4.05.2003, *Quercus pubescens* Will. forest, soil traps, 1 specimen, leg. B. Guéorguiev; Belasitsa Mt, *Castanea sativa* Mill. forest, plot No. 13 (N41.37469204 E23.20656203, 500 m.a.s.l.), 29.03–19.05.2010, soil traps, 1 specimen, leg. B. Guéorguiev & C. Deltshv.

Mycetophagus (Mycetoxides) fulvicollis Fabricius, 1792

References: Anonymous (1907: 301); Háva (2021: 13); Háva (2022: 308).

Mycetophagus (Parilendus) quadriguttatus P. W. J. Müller, 1821

References: Guéorguiev & Ljubomirov (2009: 254); Guéorguiev (2011: 13); Nikitsky 2013 (Fauna Europaea); Háva (2021: 13).

Republished data by Guéorguiev & Ljubomirov (2009) and Guéorguiev (2011): Maleshevska Planina Mt, 3 km east of Nikudin Village, 600 m.a.s.l., 16.04–4.05.2003, soil traps in deciduous forest, 1 specimen,

leg. S. Lazarov; Belasitsa Mt, *Castanea sativa* forest, plot No. 11 (N41.37234656 E23.20370984, 600 m.a.s.l.), 27.03–17.05.2010, soil traps, 2 specimens, leg. B. Guéorguiev & C. Deltshev.

Mycetophagus (Ulolendus) atomarius (Fabricius, 1787)

References: Joakimov (1904: 38 sub *Tritoma atomaria*); Roubal (1931: 453); Háva (2022: 310).

Mycetophagus (Ulolendus) decempunctatus decempunctatus Fabricius, 1801

References: Nikitsky 2013 (Fauna Europaea); Háva (2022: 311).

New data: Veliko Tarnovo Region, BG0000275 Natura 2000 Protected Area Yazovir Stamboliyski, 19.VI.2012, light trap, 1 specimen, leg. B. Guéorguiev & E. Chehlarov.

Mycetophagus (Ulolendus) piceus (Fabricius, 1777)

References: Nikitsky 2013 (Fauna Europaea); Háva (2021: 13); Háva (2022: 312).

New data: Konyavska Planina Mt, Zemen Railway Station – Zemen Monastery, 6.06.1954, 1 specimen, leg. S. Bocharov.

Pseudotriphyllus Reitter, 1880

Pseudotriphyllus suturalis (Fabricius, 1801)

References: Nikitsky 2013 (Fauna Europaea); Háva (2022: 314).

Triphyllus Dejean, 1821

Triphyllus bicolor (Fabricius, 1777)

References: Nikitsky 2013 (Fauna Europaea); Guéorguiev (2011: 13); Háva (2021: 14); Háva (2022: 315).

Republished data by Guéorguiev (2011): Belasitsa Mt, *Castanea sativa* forest, plot No. 3

N41.36326015 E23.20125052, 800 m.a.s.l.), 18.05–4.07.2010, soil traps, 2 specimens, leg. B. Guéorguiev & C. Deltshev.

Typhaea Stephens, 1829

Typhaea stercorea (Linnaeus, 1758) [= *fumata* (Linnaeus, 1767)]

References: Joakimov (1904: 17 sub *T. fumata*); Markovich (1909: 8 sub *T. fumata*); Palm (1966: 21); Háva (2021: 14).

Bergininae Lend, 1920

Berginus Erichson, 1846

Notes: Genus readily distinguished from the other West Palaearctic genera of the family by its narrow pronotum and antenna with 2-segmented club.

Berginus tamarisci Wollaston, 1854

References: Nikitsky 2013 (Fauna Europaea).

Locality: Nesebar Town, N42.64979° E27.70904°, 16 m.a.s.l., reared from fruits of *V. album* ssp. *album*, collected fruits 9.04.2023, adult emergence 30.04.2023, 1 specimen, leg. G. Zaemdzhikova, P. Glogov.

Notes: Specimen with length of body 1.9 mm, pronotum almost parallel-sided, scarcely broader than long (width/length = 1.11) and much narrower than elytra (Fig. 9). Head large, with eyes nearly as wide as pronotum (head width/pronotum width = 0.89), with clypeus separated from forehead by an incised furrow. Completely pitch brown coloured.

Distribution: According to Háva (2022), the species has been established in Europe (Austria, Belgium, Bosna-Herzegovina, Croatia, Czech Republic, England, France, Germany, Georgia, Greece, Hungary, Italy, Malta, Poland, Romania, Russia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey), Africa (Algeria, Egypt, Madeira, Morocco, Tunisia, Nigeria) and Israel. An earlier species indication exists for Bulgaria in Fauna Europaea (Nikitsky, 2013) despite no specific data has been provided there. That is why the record near



Fig. 9. *Berginus tamarisci* – specimen reared from European mistletoe, near Nesebar Town. Scale bar 0.5 mm.

Nesebar appears the first detailed species datum from the country.

Bionomics: According to Leschen (2000) [in Lawrence et al., 2014], species of *Berginus* Erichson feed on pollen or attack lac scale insects (Hemiptera: Coccoidea).

Discussion

In this study, four species – *Dienerella filiformis*, *Melanophthalma rhenana*, *M. taurica* (Latridiidae) and *Berginus tamarisci* (Mycetophagidae) are reported for the first time on *Viscum album*. The list of insects on *V. album* in Great Britain and continental Europe does not include these coleopteran species, or other species of these two families (Thomas et al., 2023). Until now, the coleopteran fauna associated with European mistletoe belongs to the following families – Anobiidae (4 species), Anthribidae (2), Apionidae (1), Buprestidae (4), Cantharidae (1), Cerambycidae (6), Corylophidae (2), Curculionidae (1), Laemophloeidae (3), Melyridae (2) and Scolytidae (1).

In addition, the species *Cryptophagus intermedius*, *Dienerella filiformis* and *Melanophthalma rhenana* are here first time recorded for the fauna of

Bulgaria. The first and the third species are noted first time from the Balkan Peninsula, as well. *Melanophthalma taurica* and *Berginus tamarisci* are two species that have been left unmentioned for the country in the latest catalogues about families Latridiidae and Mycetophagidae, in spite of both were earlier noted in other announcements. In this study the two species are confirmed for Bulgaria, with their first detailed data reported. The opportunity to deals with *B. tamarisci* incited us to make a checklist of the Bulgarian hairy fungus beetles which includes new and some re-published data.

Acknowledgements

The first author is thankful to Wolfgang Rucker (Neuwied, Germany) and Hans-Peter Reike (Moritzburg, OT Boxdorf, Germany) for the given literature and useful communication regarding the representatives of family Latridiidae.

References

- Anonymous 1907 Collections du Musée d'Histoire Naturelle de Son Altesse Royale Ferdinand I Prince de Bulgarie. Sofia, xiv + 484 pp.
- Assyov B., Petrova A., Dimitrov D., Vassilev R. 2012 Conspectus of the Bulgarian vascular flora. Bulgarian Biodiversity Foundation, 489 pp. (In Bulgarian)
- Bekchiev R., Antov M., Boyadzhiev P., Zaemdzhikova G., Kostova R., Guéorguiev B. 2022 *Carabus variolosus* (Fabricius, 1787) (Coleoptera: Carabidae) in Bulgaria: rediscovered after 111 years. *Historia naturalis bulgarica* 44 (10): 119–123.
<https://doi.org/10.48027/hnb.44.103>
- Guéorguiev B. 2011 Biodiversity of beetles (Insecta: Coleoptera) in chestnut forests, Belasitsa Mountain. In: Zlatanov T., Velichkov I., Nikolov B. (eds) State and prospects of the *Castanea sativa* population in Belasitsa mountain: climate change adaptation; maintenance of biodiversity and sustainable ecosystem management. Project BG 0031 EEA report: 1–17.
- Guéorguiev B., Ljubomirov T. 2009 Coleoptera and Hymenoptera (Insecta) from Bulgarian Section of the Maleshevska Planina Mountain: Study of an

- Until Recently Unknown Biodiversity. *Acta zoologica bulgarica* 61 (3): 235–276.
- Háva J. 2021 Additions and corrections of the family Mycetophagidae (Insecta: Coleoptera) from the Catalogue of Palaearctic Coleoptera, Volume 5 – Tenebrionoidea, 2020. *Natura Somogyiensis* 36: 11–14.
- Háva J. 2022 World Catalogue of Mycetophagidae (Coleoptera: Tenebrionoidea). *Studies and Reports Taxonomical Series* 18 (2): 287–331.
- Joakimov D. 1904 Prinosa kam Balgarskata fauna na nasekomite – Insecta. I. Coleoptera. *Tvardokrili. Brambari. Sbornik za umotvorenia, nauka i knizhnina*, Sofia 20 (9): 1–43. (In Bulgarian)
- Johnson C. 2007 Latridiidae. In Löbl I., Smetana A. (eds) *Catalogue of Palaearctic Coleoptera*, vol. 4. Apollo Books, Stenstrup, pp. 74–80, 635–648.
- Kahle-Zuber D. 2008 Biology and evolution of the European mistletoe (*Viscum album*). Doctoral Thesis, 112 pp.
<https://doi.org/10.3929/ethz-a-005728816>
- Lawrence J.F., Escalona H.E., Leschen R.A.B., Ślipiński A. 2014 Review of the genera of Mycetophagidae (Coleoptera: Tenebrionoidea) with descriptions of new genera and a world generic key. *Zootaxa* 3826 (1): 195–229.
- Leschen R.A.B. 2000 Beetles feeding on bugs (Coleoptera, Hemiptera): repeated shifts from mycophagous ancestors. *Invertebrate Taxonomy* 14: 917–929.
- Markovich A. 1909 Prinosa za nasekomnata fauna v razgradskata okolnost. *Sbornik za umotvorenia, nauka i knizhnina*, Sofia 25 (7): 3–20. (In Bulgarian)
- Míka P. 2023 *Melanophthalma rhenana* Rücker & Johnson, 2007 from the Czech Republic (Coleoptera: Latridiidae). *Studies and Reports Taxonomical Series* 19 (1): 199.
- Netolitzky F. 1912 Eine Sammelreise nach Bulgarien. *Koleopterologische Rundschau* 1: 137–143, 156–163.
- Nikitsky N. 2013 Mycetophagidae. In: Audisio P. *Fauna Europaea: Coleoptera 1, Beetles*. Fauna Europaea version 2017.06.
<https://fauna-eu.org>
- Otero J.C., Johnson C. 2013 Species of *Cryptophagus* Herbst, 1792, belonging to the “*dentatus* group” (Coleoptera: Cryptophagidae) from the Western Palearctic region. *Entomologia Fennica* 24: 81–93.
- Palm T. 1966 På koleopterologiska excursioner vid Bulgariens Svarta havskust. *Entomologisk Tidskrift* 87: 5–22.
- Roubal J. 1931 Fragmente zur Koleopterfaunistik des balkanischen Festlands. *Entomologischer Anzeiger* 11: 437–438, 453–454.
- Rücker W.H. 1982 Zur Verwandtschaft von *Melanophthalma distinguenda* (Comolli). *Entomologische Blätter* 78 (2–3): 79–80.
- Rücker W.H. 2013 Latridiidae. In: Audisio P. *Fauna Europaea: Coleoptera 1, Beetles*. Fauna Europaea version 2017.06.
<https://fauna-eu.org>
- Rücker W.H. 2020 Latridiidae und Merophysiidae der West-Paläarktis. 2. Auflage. Selbstverlag Wolfgang H. Rücker, Neuwied, 748 pp.
- Rücker W.H., Johnson C. 2013 Revision of *Melanophthalma taurica* (Mannerheim, 1844) species-group and description of three new species (Coleoptera: Latridiidae). *Latridiidae* 5: 11–24.
- Thomas P.A., Dering M., Giertych M.J., Iszkuło G., Tomaszewski D., Briggs J. 2023 Biological Flora of Britain and Ireland: *Viscum album*. *Journal of Ecology* 111 (3): 701–739.
<https://doi.org/10.1111/1365-2745.14036>