HISTORIA NATURALIS BULGARICA

ISSN 2603-3186 (online) · ISSN 0205-3640 (print)

Volume **44** · Issue **10**

Contents

Ana Nahirnić-Beshkova, Stoyan Beshkov, Predrag Jakšić
New records of rare butterflies (Lepidoptera: Papilionoidea) in Albania 109

Eberhard Zielke
Proposals for replacement names for two Afrotropical species of the subfamily Phaoniinae and esurrection of a *Phaonia* species (Diptera: Muscidae) 117

Rostislav Bekchiev, Miroslav Antov, Peter Boyadzhiev, Gergana Zaemdzhikova, Rumyana Kostova, Borislav Guéorguiev
Carabus variolosus (Fabricius, 1787) (Coleoptera: Carabidae) in Bulgaria: rediscovered after 111 years 119

Dilian Georgiev
A new species of *Microstygia* Georgiev et Glöer, 2015 (Gastropoda: Hydrobiidae) from Bulgaria 125

National Museum of Natural History — Bulgarian Academy of Sciences
Sofia · 2022

Published online **14 November 2022** by:
National Museum of Natural History, Bulgarian Academy of Sciences
1 Tsar Osvoboditel Blvd, 1000 Sofia, Bulgaria
https://www.nmnhs.com/historia-naturalis-bulgarica/

Editorial board

Editor-in-chief: Stanislav Abadjiev
Editors: Boyan Zlatkov, Georgi N. Markov, Mario Langourov, Nikolay Simov, Peter Shurulinkov, Vladislav Vergilov
Advisers | Consultants: Christo Deltshev, Fedor V. Konstantinov, Giancarlo Statti, Ljiljana Tomović, Peter Huemer, Peter Jäger, Richard Gemel, Rossen Tzonev, Snejana Grozeva

OPEN ACCESS

Distributed under the Creative Commons Attribution 4.0 International License (CC BY 4.0)

Historia naturalis bulgarica 44 (10): 109–115
ISSN 2603-3186 (online) | ISSN 0205-3640 (print) · nmnhs.com/historia-naturalis-bulgarica
https://doi.org/10.48027/hnb.44.101
Publication date [online]: 14 November 2022

Research article

New records of rare butterflies (Lepidoptera: Papilionoidea) in Albania

Ana Nahirnić-Beshkova[1], Stoyan Beshkov[2], Predrag Jakšić[3]

(1) National Museum of Natural History, Bulgarian Academy of Sciences, 1 Tsar Osvoboditel Blvd, 1000 Sofia, Bulgaria,
ana.diaphana@gmail.com; https://orcid.org/0000-0002-7922-9910
(2) National Museum of Natural History, Bulgarian Academy of Sciences, 1 Tsar Osvoboditel Blvd, 1000 Sofia, Bulgaria,
stoyan.beshkov@gmail.com; https://orcid.org/0000-0002-5459-0101
(3) Čingrijina 14/25, Zvezdara, 11050 Belgrade, Serbia,
jaksicpredrag@gmail.com; https://orcid.org/0000-0002-2604-9449

Abstract: Field work conducted in 2016–2019 and 2022 contributed with additional data on 23 relatively rare species in Albania, including the second record of *Cacyreus marshalli* and the sixth record of *Apatura metis*. Several new localities are given for *Danaus chrysippus,* which proved to be not rare on the southern coast of Albania.

Keywords: Albania, new records, Papilionoidea

Introduction

Studies of butterflies in Albania increased in the last several years and resulted in findings of several new species for the country. According to Verovnik & Popović (2013a) checklist comprises 196 butterfly species. Šašić et al. (2015) added two more species. Micevski et al. (2015) found *Antocharis damone* Boisduval, 1836 new for the country and confirmed *Apatura metis* Freyer, 1829, which was not listed in Verovnik & Popović (2013a). Sachanovicz et al. (2016) reported two more new species: *Cacyreus marshali* Butler, 1898 and *Melitaea diamina* (Lang, 1789). These authors mentioned *A. damone* as newly recorded for Albania but this species has already been published several months before. Sachanovicz et al. (2016) drew attention to the paper of Misja (2005) and suggested that *Euchloe penia* (Freyer, 1851) and *Pseudochazara cingovskii* (Gross, 1973) should be included in species list. Cuvelier et al. (2018) gave comprehensive overview and reported new species for Albania. According to them the number of butterfly species with recent evidence in Albania is 196 while four species are considered as data deficient and at least nine are potential. Recently, *Proterebia phegea* (Borkhausen, 1788) was reported for the first time in Albania (Verovnik & Verovnik, 2022). There are still several species expected in Albania. Because the field research of the authors was focused mostly on lamp collecting of nocturnal species at the night and on the family Zygaenidae at the day time, butterflies were a little bit neglected. Only a few Papilionoidea species were published in Beshkov & Nahirnić, (2019), Beshkov & Nahirnić-Beshkova (2021), Beshkov, Plant & Nahirnić (2020) and in Nahirnić & Beshkov (2017). In this paper we provide new records for 23 relatively rare species in Albania.

Material and methods

Field work was conducted in 2016–2019 and 2022 in all parts of Albania. *Hipparchia* specimens were determined on the basis of genitalia according to Coutsis (1983). Most of the specimens were just observed or caught and released after determination. Collected specimens are stored in the collections of Ana Nahirnić-Beshkova and Stoyan Beshkov, both stored in the National Museum of Natural History in Sofia.

Received: 20 October 2022; accepted: 1 November 2022 · Editor: Stanislav Abadjiev

Fig. 1. Habitat of *Anthocharis damone* Boisduval, 1836 at Gramsh Municipality, between Bratillë and Kokël villages, N40°46'33", E20°17'59", 507 m, 5.05.2022.

Results and discussion

Hesperidae

Pyrgus serratulae (Rambur, [1839])

Near Prespa Lake, SW of Gllobočen Village, N40°50'44", E20°55'27", 930 m, 4.06.2022. It is known from several localities in southern Albania (Cuvelier et al., 2018). Our record is isolated from others. Record presented on the map in Cuvelier et al. (2018) falls on Mali i Thanës (= Mt Galičica) but it must be referred to the North Macedonian part of the mountain because Rebel & Zerny (1931) quoted Drenowsky (1930) who collected only at North Macedonian part and never at Albanian territory.

Spialia phlomidis (Herrich-Schäffer, 1845)

Ivan Mt, above Zvezdë Village, N40°43'59", E20°52'49", 1088 m, 6.07.2016; Gramsh Municipality, Bratillë Village, N40°46'15", E20°18'38", 515 m, 5.05.2022; Valamara Mt, above Bratillë Village, N40°46'20", E20°20'06", 994 m, 7.06.2022. Occurs in northern and south-eastern part of the country. Two of our records from Bratillë are the only ones in central Albania.

Muschampia proto (Ochsenheimer, 1808)

Sarandë Municipalty, Butrint vicinity, N39°44'47", E20°00'39", 38 m, 18.X.2016; Gjirokastër County, Finiq Municipality, between Dhrovjan and Syri i Kaltër, N39°54'34", E20°11'23", 178 m, 13.07.2018, nectaring on *Centaurea melitensis* L. Beshkov (1995) reported this species for the first time for Albania from Himara and Muzina. All records originate from southern Albania.

Gegenes pumilio (Hoffmannsegg, 1804)

Sarandë municipalty, Butrint vicinity, N39°44'47", E20°00'39", 38 m, 18.10.2016.

Papilionidae

Parnassius apollo (Linnaeus, 1758)

Korçë County, above Drenovë Village, N40°35'18", E020°48'23", 1050 m, 7.07.2016; Tirana County, Mali me Gropë Mts, N41°21'09", E20°02'47", 1405 m, 17.07.2018; Tirana Municipality, Mali me Gropë, N41°21'42", E20°03'24", 1495 m, 16.07.2018; Munella Mt, above Kimez Village, N41°57'13", E20°05'06", 1325 m 7.07.2019; Munella Mt, southern foothill, N41°56'57", E20°05'33", 1405 m, 7.07.2019; Munella Mt, south-eastern foothill, N41°57'18", E20°06'13", 1490 m, 7.07.2019. Not reported from Munella Mt before.

Pieridae

Anthocharis damone Boisduval, 1836

Gramsh Municipality, between Bratillë and Kokël villages, N40°46'33", E20°17'59", 507 m (Fig. 1), 5.05.2022. It is known from two localities in Albania, Bratillë in central Albania (Micevski et al., 2015) and Borsch in southern Albania (Sachanowicz et al. 2016). We observed ca. 20 specimens flying on steep slopes, two of which were females.

Colias croceus f. *erateformis* Niculescu, 1963

Sarandë Municipalty, Ksamil Village south, N39°44'47", E19°59'58", 20 m, 18.10.2016. 1 male collected (Fig. 2), genitalia checked (Fig. 3). Both *Colias erate* (Esper, 1805) and *C. croceus* (Geoffroy, 1785) can be very variable. Several forms can't be distinguished without genitalia examination especially yellow form *C. croceus* f. *erateformis* (Poorten et al., 1988; John et al., 2006). *Colias erate* is not mentioned to occur in Albania in checklists of butterflies. It is present in all surrounding countries and can be expected. In order to be sure that we found *C. erate* we dissected our specimen. According to genitalia (Gen. prep. 1./12.I.2017, S. Beshkov) this specimen turns out to be *C. croceus*. We suggest close examination of all specimens that resemble *C. erate* in Albania. *Colias croceus* f. *erateformis* has been found in Romania, Greece, Cyprus and Turkey and it is very rare (Hutsebaut et al., 2020).

Fig. 2. *Colias croceus* f. *erateformis* Niculescu, 1963 male. Ksamil, 18.10.2016. Scale = 1 cm.

Fig. 3. *Colias croceus* f. *erateformis* Niculescu, 1963 male genitalia. Ksamil, Gen. prep. 1./12.I.2017, S. Beshkov, male genitalia on glass in Euparal.

Colias aurorina Herrich-Schäffer, 1850

Mt Moravë, Dardhë, N40°31'15", E20°49'56", 1241 m, 4.06.2018. It is known from Mt Moravë, Mt Grammos, Mt Lunxhërizë and Mt Nemërçkë. On Mt Moravë Verovnik & Popović (2013b) found it near the pass between Boboshticë and Dardhë, Šašić et al. (2015) found it near the same pass and near Boboshticë and Sachanowicz et al. (2016) recorded it from area west of village of Drenovë. Also, Cuvelier et al. (2018) found it in a wider area of the mentioned pass. We found it at new locality on Mt Moravë which is 2.3 km far from the nearest locality of the pass between Boboshticë and Dardhë published by Šašić et al. (2016). Our locality near Dardhë is characterised by southerly to westerly exposed slopes covered with *Astracantha* sp.

Fig. 4. Locality of *Cacyreus marshali* Butler, 1898, *Danaus chrysippus* (Linnaeus, 1758) and *Charaxes jasius* (Linnaeus, 1767). Vlorë County, Himarë Municipalty, village Ilias S, Gjipe Beach, 18.10.2016.

Lycaenidae

Cacyreus marshalli Butler, 1898

Vlorë County, Himarë Municipalty, village Ilias S, Gjipe Beach, N40°07'38", E19°40'17", 30 m, 18.10.2016, Eunis habitat type F5.213 Eastern Mediterranean high maquis (Fig. 4). One specimen observed nectaring. This species is native to Southern Africa. Its host-plants are *Pelargonium* spp. and *Geranium* spp. It was introduced to Europe with its host-plants which are widely used as ornamental plants. For the first time in Europe it was discovered in Balearic Islands in 1988 (Sarto i Monteys & Maso, 1991). It is reported from many European countries and became an invasive species. Sachanovicz et al. (2016) reported it for the first time for Albania in 2016 based on specimen collected in Tirana in 2009. Our finding represents the second record of this species in Albania. The nearest known locality is in Corfu Island (Parker, 2010). No host-plants were noticed at our site.

Scolitantides orion (Pallas, 1771)

Pogradec Municipality, Guri i Kamjes N40°50'14", E20°36'53", 1440 m, 5.06.2022; Valamara Mt, above Bratillë Village, N40°46'20", E20°20'06", 994 m, 7.06.2022. There are only two records from southern part of the country.

Eumedonia eumedon (Esper, [1780])

Dajt Mt, E side, Qafa e Priskës N, N41°20'44", E19°57'14", 915 m, 5.06.2019; Pogradec Municipality, Maja e Ahishtës, N40°59'54", E20°36'31", 1320 m, 8.06.2022. It is known from north-eastern and south-eastern part of the country. Our record is the only one in central Albania.

Aricia artaxerxes (Fabricius, 1793)

Tirana County, Mali me Gropë Mts, N41°21'09", E20°02'47", 1405 m, 17.07.2018. There are only two records from the central part of the country.

Lycaena virgaureae (Linnaeus, 1758)

Tirana Municipality, Mali me Gropë, N41°21'42", E20°03'24", 1495 m, 16.07.2018. There are no data for the central part of the country with exception of one

near the border of North Macedonia (Cuvelier et al., 2018).

Lycaena ottomanus (Lefèbvre, 1830)

Permet Municipality, Benjë-Novoselë Village vic., N40°14'39", E20°25'22", 437 m, 6.06.2018; Sarandë Municipalty, Butrint vicinity, N39°44'47", E20°00'39", 38 m, 18.10.2016. It is rare species in Albania. This is one of the most inland localities in Albania.

Lycaena candens (Herrich-Schäffer, 1844)

Tirana Municipality, Mali me Gropë, N41°21'42", E20°03'24", 1495 m, 16.07.2018. There are no data for the central part of the country.

Nymphalidae

Danaus chrysippus (Linnaeus, 1758)

Between Lushnjë and Kuçovë, Near Fier-Shegan Village, 16.10.2016; Vlorë County, Orikum Town vicinity, N40°19'25", E19°28'50", 15 m, 17.10.2016, agricultural area, 1 specimen on the road and 1 flying; Vlorë County, Himarë Municipalty, between villages of Dhërmi and Ilias, St Theodore, N40°07'52", E19°39'19", 135 m, 18.10.2016, one specimen observed flying; Vlorë County, Himarë Municipalty, village Ilias S, Gjipe Beach, N40°07'35", E19°40'15", 0 m (Fig. 4), 18.10.2016, one specimen observed flying above sea near the beach; Vlorë County, Himarë Municipalty, Porto Palermo Castle vicinity, N40°04'00", E19°47'34", 20 m, 18.10.2016, two specimens observed nectaring in Eunis habitat type F5.52 *Euphorbia dendroides* formations. This widely distributed migratory species is observed in coastal areas in many Mediterranean countries and colonised some of them. In surrounding countries, it is reported for Greece (Owen, 1991) and Montenegro (Jakšić & Ristić, 1999). It is previously recorded from Albania from nine localities in coastal areas from Tirana to Saranda (Luquet & Misja, 1989; Gaskin 1990; Beshkov & Nahirnić, 2019). Those records date to 1979, 1982, 1988 and 2018. It was reported from the sea coast between Qeparo and Porto Palermo in November (Beshkov & Nahirnić, 2019). Must be the period of the year September–November why this conspicuous butterfly has not been observed in Albania for a long time, since that is not period of the year when butterfly researchers usually conduct their research.

Charaxes jasius (Linnaeus, 1767)

Vlorë County, Himarë Municipalty, between villages of Dhërmi and Ilias, St Theodore, N40°07'52", E19°39'19", 135 m, 18.10.2016; Vlorë County, Himarë Municipalty, S of village of Ilias, Gjipe Beach, N40°07'35", E19°40'15", 0 m (Fig. 4), 18.10.2016; Sarandë Municipalty, Bistricë Village, N39°55'15", E20°07'53", 115 m, 7.06.2016; Sarandë Municipalty, Syri i Kaltër, N39°55'23", E20°11'29", 158 m, 6.08.2018, one male in light trap. The only source where exact localities of *C. jasius* are mentioned are those three in Rebel & Zerny (1931) and one locality in Nahirnić & Beshkov (2017). Misja & Kurizzi (1984) found it during their research but there is no further information about it. Cuvelier et al. (2018) omitted Nahirnić & Beshkov (2017) in literature overview for *C. jasius*. Main host-plant is *Arbutus unedo* L., 1753 which is noticed at all visited sites.

Apatura metis Freyer, 1829

Syri i Kaltër, N39°55'23", E20°11'29", 158 m, 6.08.2018. Known from Lake Shkodër (Micevski et al., 2015; Sachanowicz et al., 2016; Cuvelier et al., 2018) and Tirana surroundings (Rebel & Zerny, 1931). Our finding at Syri i Kaltër is the only known locality in southern part of the country. Our record is the sixth for Albania.

Brenthis hecate ([Denis & Schiffermüller], 1775)

Valamara Mt, above Bratillë Village, N40°46'29", E20°20'27", 1018 m, 7.06.2022. There are just a few localities in central and southern part of the country.

Euphydrias aurinia (Rottemburg, 1775)

Korçë County, Mt Moravë, Dardhë, N40°31'15", E20°49'56", 1241 m, 4.06.2018; Korçë County, Mt Moravë, Boboshticë, N40°32'39.25", E020°46'57.70",

1151 m, 4.06.2018. The species is included in the Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora. There are only several data in different regions of Albania (Cuvelier et al., 2018). Our finding is the first one for Mt Moravë and Korçë County.

Hipparchia volgensis (Mazochin-Porshnjakov, 1952)

Bulqizë, Mt Thanës, above Plani i Bardhë Village, N41°28'34", E20°09'19", 767 m, 21.07.2018; Valamara Mt, above Bratillë Village, N40°46'20", E20°20'06", 994 m, 7.06.2022. In the central part of Albania where it was only from the area of Tirana (Cuvelier et al., 2018).

Pseudochazara amalthea (Frivaldszky, [1845])

Korçë County, Voskopojë Village N, N40°38'58", E020°34'59", 1150 m, 11.07.2018; Korçë County, above Drenovë Village, N40°35'18", E020°48'23", 7.7.2016; Korçë County, below Dardhë, above Boboshticë Village, N40°32'26", E020°47'31", 8.07.2016; Korçë-Colonje Mt Kuq, Qarrit Pass, west from Pepellash Village N40°28'55", E020°41'27", 27.06.2017, 22.8.2017; on the road from Korçë to Erseka, below Pepellash Village, N40°28'54", E020°40'29", 27.6.2017; on the road from Korca to Erseka, below Pepellash Village, N40°28'53", E020°40'31", 27.6.2017. In Albania it is known only from the south-eastern part. We are adding new localities and fill the gaps in its distribution around Korçë.

Pseudochazara tisiphone Brown, 1980

Bulqizë, Mt Thanës, above Plani i Bardhë Village, 767 m, N41°28'34", E20°09'19", 21.07.2018; Mt Moravë, Korçë Municipality, above Drenovë Village, 1067 m, N40°35'18", E20°48'23", 8.07.2016; Korçë County, below Dardha, above Boboshtica Village, N40°32'26", E20°47'31", 8.07.2016; Korçë-Kolonje on the road from Korca to Erseka, the pass of the border Korçë-Kolonje County, N40°28'54"; E020°40'29";, 27.6.2017; on the road from Korçë to Erseka, below Pepellash Village, N40°28'53", E020°40'31", 27.6.2017; Korçë County, Voskopojë Village N, N40°38'58", E020°34'59", 1150 m, 11.07.2018. In Albania it is known only from the surroundings of Korçë and Bulqizë. We are adding new localities to each of those areas.

Lasiommata petropolitana (Fabricius, 1787)

Mt Moravë, 1,3 km SW Dardhë, road to Arrëz Village, N40°30'40", E20°48'49", 1455 m, 5.06.2018. It is reported only from mountains in northern Albania (Cuvelier et al., 2018). Record presented on the map in Cuvelier et al. (2018) falls on Mali i Thanës (= Mt Galičica) but it must be referred to the North Macedonian part of the mountain because Rebel & Zerny (1931) quoted Drenowsky (1930) who collected only at North Macedonian part and not at Albanian territory.

Acknowledgements

We are thankful to Jelica Novaković (Belgrade, Serbia) for determination of *Centaurea melitensis*.

References

Beshkov S. 1995 Contribution to the knowledge of the Lepidoptera fauna of Albania 2. Some findings of a collecting trip in September 1993 (Lepidoptera, Macrolepidoptera). Atalanta 26 (1/2): 365–399.

Beshkov S., Nahirnić A. 2019 A contribution to knowledge of the Balkan Lepidoptera: species collected in the autumn of 2018 in Albania (Macrolepidoptera with some Crambidae). Entomologist's Record and Journal of Variation 131: 66–102.

Beshkov S., Nahirnić-Beshkova A. 2021 Contribution to knowledge of the Balkan Lepidoptera II (Lepidoptera: Macrolepidoptera). Ecologica Montenegrina 42: 1–44.

Beshkov S., Plant C., Nahirnić A. 2020 A Contribution to Knowledge of the Balkan Lepidoptera: Some species collected in Albania in August 2018. Entomologist's Record and Journal of Variation 132: 129–152.

Coutsis J.G. 1983 Description of the Female Genitalia of *Hipparchia fagi* Scopoli, *Hipparchia semele*

Linnaeus (Satyridae) and their Related Taxa. The Journal of Research on the Lepidoptera 22 (3): 161–203.

Cuvelier S., Parmentier L., Paparisto A., Couckuyt J. 2018 Butterflies of Albania – Fluturat e Shqipërisë. New surveys, new species and a new checklist (Lepidoptera: Papilionoidea). Phegea 46 (2): 48–69.

Drenowsky A.K. 1930 Beitrag zur Lepidopterenfauna S. W. Mazedoniens. Spisanie na Balgarskata akademiya na naukite 42: 129–177, 2 figs. (In Bulgarian)

Eitschberger U., Tamer P.S. 1990 *Cacyreus marshalli* Butler, 1898, eine neue Tagfalterart für sie europäische Fauna? (Lepidoptera, Lycaenidae). Atalanta 21: 101–108.

Gaskin D. 1990 Butterflies in Albania, September 1988 (Lepidoptera: Hesperioidea & Papilionoidea). Phegea 18 (1): 23–26.

Hutsebaut J., Leertouwer H.L., Stavenga D.G. 2020 Polymorphism of *Colias croceus* from the Azores caused by differential pterin expression in the wing scales. Journal of Insect Physiology 127: 104114.

Jakšić P., Ristić G. 1999 New and rare species of Lepidoptera in Yugoslavia. Acta entomologica serbica 4 (1/2): 63–74.

John E., Coutsis J., Makris C. 2006 A review of records for *Colias erate* (Esper, [1805]) (Lep.: Papilionoidea Pieridae) in Cyprus: were they all yellow forms of *Colias croceus* (Geoffroy, 1785)? Entomologist's Gazette 57: 3–12.

Luquet G., Misja K. 1989 Premières observations de *Danaus chrysippus* (L.) en Albanie (Lepidoptera Nymphalidae). Alexanor 16 (2): 67–70.

Micevski N., Franeta F., Gascoigne-Pees M., Micevski B., Verovnik R. 2015 Butterfly surveys in Albania during 2014 including the discovery of two new species for the country. Ecologica Montenegrina 3: 1–12.

Misja K. 2005 Fluturat e Shqipërisë. Macrolepidoptera (Rhopalocera, Bombyces & Sphinges. Noctuidae, Geometridae). Akademia e Shkencave e Shqipërisë. Instituti i Kërkimeve Biologjike, Tiranë, 247 pp.

Misja K., Kurrizi A. 1984 Resultats des recherche des papillons diurnes (Rhopalocera, Grypocera) de notre pays. Buletini i Shkencave të Natyrës 12: 105–111.

Nahirnić A., Beshkov S. 2017 *Penestoglossa dardoinella* (Millière, 1863) (Lepidoptera: Psychidae) recorded for the first time in Albania. ZooNotes 101: 1–3.

Owen D. 1991 Can *Danaus chrysippus* (L) (Lepidoptera: Danaidae) establish itself in Europe? Entomologist's Gazette 42: 37–39.

Parker R. 2010 *Cacyreus marshalli* Butler, 1898 (Lepidoptera, Lycaenidae) newly recorded for Corfu, with notes on other butterflies on the island in September 2008. Entomologist's Gazette 61: 40–42.

Rebel H., Zerny H. 1931 Die Lepidopterenfauna Albaniens (mit Berücksichtigung der Nachbargebiete). Denkschriften der Akademie der Wissenschaften in Wien, Mathematisch-Naturwissenschaftliche Klasse 103: 37–161.

Sachanowicz K., Luczkowski S., Larysz A. 2016 State of Knowledge of Butterfly Fauna of Albania, with Three New Species for the Country. Acta zoologica bulgarica 68 (4): 511–518.

Sarto i Monteys V., Maso A. 1991 Confrmation of *Cacyreus marshalli* Butler, 1898 (Lycaenidae: Polyommatinae) as a new species for the European fauna. Boletín De Sanidad Vegetal, Plagas 17 (1): 173–183.

Šašić M., Popović M., Cuvelier S., Đurić M., Franeta F., Gascoigne-Pees M., Koren T., Maes D., Micevski B., Micevski N., Mølgaard M.S., van Swaay C., Wynhof I., Verovnik R. 2015 Contribution to the knowledge of the butterfly fauna of Albania. Nota Lepidopterologica 38 (1): 29–45.

van der Poorten D., Dils J., Coutsis J.G. 1988 *Colias erate* (Esper, 1804), a true resident of the Greek butterfly fauna (Lepidoptera: Pieridae). Phegea 16 (4): 123–127.

Verovnik R., Popović M. 2013a Annotated checklist of Albanian butterflies (Lepidoptera, Papilionoidea and Hesperioidea). Zookeys 323: 75–89.

Verovnik R., Popović M. 2013b First record of the Greek Clouded Yellow (*Colias aurorina* Herrich-Schäffer, 1850) for Albania. Natura Sloveniae 15: 27–32.

Verovnik R., Verovnik J. 2022 First record of *Proterebia phegea* (Lepidoptera: Satyrinae) from Albania. Natura croatica 31 (1): 115–120.

Historia naturalis bulgarica 44 (10): 117–118
ISSN 2603-3186 (online) | ISSN 0205-3640 (print) · nmnhs.com/historia-naturalis-bulgarica
https://doi.org/10.48027/hnb.44.102
Publication date [online]: 14 November 2022

Research article

Proposals for replacement names for two Afrotropical species of the subfamily Phaoniinae and resurrection of a *Phaonia* species (Diptera: Muscidae)

Eberhard Zielke

Institute of Biodiversity and Ecosystem Research, Bulgarian Academy of Sciences, 1 Tsar Osvoboditel Blvd, 1000 Sofia, Bulgaria, eo.zielke@abv.bg

http://zoobank.org/DD7487FC-4E41-4E73-B07A-D736BB53C109

Abstract: The names of *Dichaetomyia suffusa* van Emden, 1942 and *Phaonia capensis* Zielke, 1971 are occupied by *Dichaetomyia suffusa* Malloch, 1929 and *Phaonia capensis* Curran, 1938, respectively. Therefore the replacement name *Dichaetomyia adamskae* **nom. nov.** is given to *Dichaetomyia suffusa* van Emden, 1942, and *Phaonia necapensis* **nom. nov.** to *Dichaetomyia capensis* Zielke, 1971. The differences between the two species *Phaonia necapensis* and *Phaonia brunneivittis* Emden, 1943 are described documenting that *Phaonia necapensis* is a good species, clearly distinct from *P. brunneivittis*.

Keywords: *Dichaetomyia adamskae* nom. nov., *Phaonia necapensis* nom. nov., reactivation, replacement names

Introduction

The impetus for this contribution was a comment in an unpublished compilation of the world Muscidae by Pont (Pont personal communication) that the list still contains some homonyms that still need work. Among the affected species are two Afrotropical species of the subfamily Phaoniinae, *Dichaetomyia suffusa* van Emden, 1942 and *Phaonia capensis* Zielke, 1971, for each of which a replacement name is still needed.

Dichaetomyia suffusa van Emden originating from South Africa was listed as a valid species without further comments in the Catalogue of Afrotropical Muscidae (Pont 1980). However, on the website of Systema Dipterorum (Evenhuis & Pape 2022) the species is considered as homonym of *Dichaetomyia suffusa* Malloch, 1929, described from Indonesia. The South African species *Phaonia capensis* Zielke, 1971 (Zielke, 1971) was already in the Catalogue of Afrotropical Muscidae (Pont 1980) positioned as primary junior homonym of *Phaonia capensis* described by Curran (1938) and which itself is a synonym of *Phaonia flavicornis* Stein, 1903. All three taxa originate from South Africa, but *Phaonia flavicornis* is also known from several other countries of the Afrotropical Region (Pont 1980). A similar classification of both *Phaonia capensis* species is also found on the website of Systema Dipterorum (Evenhuis & Pape, 2022). *Phaonia capensis* Zielke is listed in the Catalogues of Life (Bánki et al., 2022) as synonym of *Phaonia brunneivittis* Emden, 1943, from Uganda. However, these two species can be clearly distinguished from one another on the basis of the original characterisations of the species. Therefore, the strong evidence for treating *Phaonia capensis* as a separate species is detailed below.

Results

Resurrection of *Phaonia capensis* Zielke, 1971

A detailed description of *Phaonia brunneivittis* van Emden does not exist. The introduction of *P. brunneivittis* to science was limited to a short characterisation of the species presented in the couplets

Received: 25 October 2022; accepted: 11 November 2022 · Editor: Nikolay Simov

of van Emden's identification key (1943) to the Afrotropical species of *Phaonia*. However, the majority of the few mentioned taxonomic features of *P. brunneivittis* differs clearly from the corresponding characteristics of *Phaonia capensis* Zielke. The main differences between the two species are listed below, with the characteristics of *P. capensis* shown in brackets.

Pre-alar seta shorter than the second notopleural seta or at most of the same length (pre-alar seta much longer than the posterior notopleural seta); costal spine as a rule indistinct (costal spine well-developed and about as long as cross vein r-m); fore tibia with a posterior seta (fore tibia without a posterior seta); hind tibia with one anterodorsal seta (hind tibia with two anterodorsal setae); dark paired spots on abdominal segments 2 and 3 conspicuous, the fourth segment with a brown median vitta (abdomen with the tergites uniformly grey dusted), body length 5.3 mm (body length 8 mm).

These differences document, that *Phaonia capensis* Zielke and *Phaonia brunneivittis* van Emden have to be recognised as two different species.

Replacement name for *Dichaetomyia suffusa* van Emden, 1942

There are no questions with regards to synonymy to be clarified thus only the homonym has to be resolved for *Dichaetomyia suffusa* described by van Emden (1942) from South Africa. Since the name is preoccupied by *Dichaetomyia suffusa* Malloch, 1929 from Indonesia the replacement name *Dichaetomyia adamskae* **nom. nov.** is herewith given to *Dichaetomyia suffusa* van Emden, 1942.

Etymology: The new epithet of the species refers to Kinga Adamska from the Nicolaus Copernicus University, Toruń, Poland in recognition of the careful review of the Muscidae compilation thus bringing the still unsolved homonyms back to attention.

Replacement name for *Phaonia capensis* Zielke, 1971

As has been shown above, *Phaonia capensis* Zielke has to be recognised as a good species. Since its name is preoccupied by *Phaonia capensis* Curran, 1935 the replacement name *Phaonia necapensis* **nom. nov.** is herewith given to *Phaonia capensis* Zielke, 1971.

Etymology: The new epithet of the species "*necapensis*" is an adjective and refers to the fact that the species is not (= ne) anymore a "*capensis*".

Acknowledgements

I am very grateful to Adrian Pont for generously providing the unpublished compilation of the world Muscidae for my studies on Muscidae. The remark on the homonyms also triggered the reactivation of a synonymised *Phaonia* species. I would also like to thank the two reviewers for their very helpful comments and suggestions which have contributed to the improvement of this paper.

References

Bánki O., Roskov Y., Döring M. et al. 2022 Catalogue of Life Checklist (Version 2022-10-20). Catalogue of Life. https://doi.org/10.48580/dfqf (accessed 9 Nov 2022)

Curran C.H. 1938 African Muscidae V. American Museum Novitates 974: 1–17.

Evenhuis N.L., Pape T. 2022 Systema Dipterorum. In: Bánki O., Roskov Y., Döring M., Ower G., Vandepitte L., Hobern D., et al. Catalogue of Life Checklist (3.8, May 2022). https://doi.org/10.48580/dfq8-3bz (accessed 22 October 2022)

Malloch J.R. 1929 Fauna Buruana. Diptera, fam. Muscidae. Treubia 7: 390–408.

Pont A.C. 1980 Family Muscidae. In: Crosskey R.W. (ed.) Catalogue of the Diptera of the Afrotropical Region. British Museum (Natural History), London, 721–761.

Van Emden F.I. 1942 Keys to the Muscidae of the Ethiopian Region: *Dichaetomyia*-group [Part]. The Annals and Magazine of Natural History, ser. 11, 9: 673–701.

Van Emden F.I. 1943 Keys to the Muscidae of the Ethiopian Region: *Phaonia*-group. The Annals and Magazine of Natural History ser. 11, 10: 73–101.

Zielke E. 1971 New species of Muscidae from the Ethiopian Region (Diptera). The Journal of the Entomological Society of Southern Africa 34: 289–304.

Historia naturalis bulgarica 44 (10): 119–123
ISSN 2603-3186 (online) | ISSN 0205-3640 (print) · nmnhs.com/historia-naturalis-bulgarica
https://doi.org/10.48027/hnb.44.103
Publication date [online]: 14 November 2022

Research article

Carabus variolosus (Fabricius, 1787) (Coleoptera: Carabidae) in Bulgaria: rediscovered after 111 years

Rostislav Bekchiev[1], Miroslav Antov[2], Peter Boyadzhiev[3], Gergana Zaemdzhikova[4], Rumyana Kostova[5], Borislav Guéorguiev[6]

(1) National Museum of Natural History, Bulgarian Academy of Sciences, 1 Tsar Osvoboditel Blvd, 1000 Sofia, Bulgaria, bekchiev@nmnhs.com; https://orcid.org/0000-0001-6143-0184
(2) University of Plovdiv "Paisii Hilendarski", Faculty of Biology, Department of Zoology, 24 Tsar Asen Street, 4000 Plovdiv, Bulgaria, miroslavantov@uni-plovdiv.bg; https://orcid.org/0000-0002-5348-1069
(3) University of Plovdiv "Paisii Hilendarski", Faculty of Biology, Department of Zoology, 24 Tsar Asen Street, 4000 Plovdiv, Bulgaria, boyadz@uni-plovdiv.bg; https://orcid.org/0000-0002-5480-1431
(4) 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
(5) Department of Zoology and Anthropology, Faculty of Biology, Sofia University, 8 Dragan Tsankov Bvld, 1000 Sofia, Bulgaria, rkostova@biofac.uni-sofia.bg
(6) 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

Abstract: The rediscovery of the rare and endangered species *Carabus* (*Hygrocarabus*) *variolosus* is reported after its last record from 1909. The only known locality (Stara Planina Mts, Varshets Town) was confirmed. New records at similar habitats in the region could be expected in the future, based on extensive surveys with the proposed methods.

Keywords: beetles, monitoring, Natura 2000, protection

Introduction

Carabus (*Hygrocarabus*) *variolosus* (Fabricius, 1787) was originally recorded for Bulgaria by Apfelbeck (1904). The record was based on material gathered by the Hungarian collector and tradesman of beetles Eduard Merkl from "Serbien, Bulgarien (Stara Planina-Merkl)" [Serbia, Bulgaria (Stara Planina-Merkl]. Unfortunately, no data on the exact location, altitude or time of collection of the material were provided. Many authors usually referenced this imprecise locality to either Serbia and Bulgaria (see Guéorguiev & Guéorguiev 1995 and Ćurčić et al. 2007, among others). Later, Rambousek (1912) also mentioned Apfelbeck' *C. variolosus* locality for Bulgaria, and provided a new record from the valley of the Stara Reka River [= Botunya River] near Varshets Town (Stara Planina Mts). The material near Varshets was either observed or collected (unclear) by P. Drenski and F. Rambousek themselves, and the event supposedly happened on 20 May 1909 (ibid.). A few years later, Buresch & Kantardjieva (1928) gave a short overview of the morphology of *C. variolosus,* discussed its two subspecies, and reported one specimen they examined from the collections of the former Tsar's Entomological Station in Sofia. The specimen in question has been collected by D. Joakimov along the valley of Stara Reka River on 8.05.1909. Interestingly, D. Joakimov and the pair P. Drenski and F. Rambousek independently encountered their specimens in the same month and year. Breuning (1928) examined a specimen of *Carabus variolosus* from Bulgaria (most probably the one discussed in Buresh & Kantardjieva, 1928) sent him by I. Buresch;

Received: 5 November 2022; accepted: 8 November 2022 · Editor: Stanislav Abadjiev

Fig. 1. Habitat of *Carabus variolosus* at Botunya River, above Varshets Town, Bulgaria.

as a result, this famous authority on the genus *Carabus* Bonelli concluded that the Bulgarian population belongs to the nominotypical subspecies. *Carabus variolosus* is a glacial relict, polytypic species with two subspecies: *C. variolosus nodulosus* Creutzer, 1799 occurring in France, Belgium, Germany, Austria, Hungary, Italy, Slovenia, Croatia, Bosnia and Herzegovina, Kosovo, and Serbia, and *C. variolosus variolosus* reported to inhabit Poland, Czech Republic, Slovakia, Ukraine, Romania, Moldova, Serbia, and Bulgaria (Turin et al., 2003). The population in Germany shows very clear genetic separation, even at close distances (2–3 km), and probably the two subspecies have survived in different refugial conditions during the Last Glacial Maximum (Matern et al., 2008; Matern et al., 2010; Mossakowski et al., 2020).

In most of Europe, the species seems very rare and endangered. It is included in the Habitats Directive 92/43/EEC (Annex II). In the Red Book of Bulgaria the species is with the status of critically endangered CR [B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv)] (Guéorguiev, 2015). On the other hand, in Romania, it is widespread and frequent in undisturbed wet forests (Turin, 2003; Barloy & Prunar, 2012).

According to its ecological requirements, it is a stenotopic, hygrophilous, hygrobiont and primary forest dwelling species. It inhabits very humid forest habitats in foothills and mountains or near forests, at low and medium altitudes (up to 1000 m above sea level). Habitats of the species include banks of flowing mountain rivers and streams, bogs, swamps and their adjacent territories, often overgrown with standing trees (mainly *Alnus* sp.), less often moist forest meadows. Thus, it is considered an indicator species for natural (preserved) forest streams and smaller mountain rivers. *Carabus variolosus* (s.l.) is manly nocturnal, slowly moving, strictly attached to the streams and it surroundings (Drees et al., 2008; Matern et al., 2007).

Fig. 2. A pitfall trap, placed on the bank of Botunya River.

The species was researched in Natura 2000 protected area BG0001040 – Western Stara Planina and Pre-Balkans, during many years and different monitoring projects conducted in 2011–2015 (B. Guéorguiev, E. Chehlarov), 2019–2020 (M. Antov, P. Boyadzhiev, G. Zemdzhikova), and 2022 (R. Kostova, R. Bekchiev). Here we reported the results from the successful expedition in 2020.

Material and methods

The material was collected in 2020, during field expeditions in Stara Planina Mts, in the valley of Botunya River (Fig. 1), near Varshets Town. Adult specimens were caught in a predetermined monitoring area using pitfall traps (plastic containers) (Fig. 2). The traps are buried in the soil up to their upper edge. The traps used for monitoring purposes are live traps and accordingly no fixative or other killing agent was used. In order to avoid predation and cannibalism, which occur in such traps, at the bottom were placed forest litter and twigs from the surroundings ensuring hiding places for the specimens. To sample *Carabus variolosus* – as a water-bound species, traps should be placed linearly along the banks of mountain streams, small rivers, and other appropriately suitable habitats, at a distance of 1.5 meters maximum from the shore of the respective waterbody. The exposure of the traps lasted 24 hours.

Results

Carabus (*Hygrocarabus*) *variolosus* (Fabricius, 1787)
Figs 3, 4

Stara Planina Mts, Varshets Town, bank of Botunya River, *Fagus sylvatica* forest, N43.149617° E23.232467°, a single specimen, collected in the pitfall traps (without fixative agent) set on 13–14.06.2020 and

Fig. 3. Adult *Carabus variolosus* in a pitfall trap (Botunya River).

Fig. 4. *Carabus variolosus* – in situ, on a tree stem near site of capture (Botunya River).

released alive at the same place. The only one individual was observed by M. Antov, P. Boyadzhiev, G. Zaemdzhikova.

Discussion

The increase of funding for field studies of protected species in recent years led to the expected positive results and many records of new localities and confirmation of old ones for species that were even considered extinct or non-existing on the territory of Bulgaria (Bekchiev et al. 2018, 2020). The current finding of *Carabus variolosus* confirms the above mentioned trend, and future large-scale surveys of the entire Varshets and West Stara Planina region are needed to establish the possible optimal and potential habitats of the species. It is very likely that the population above Varshets is small, with a limited range and possibly genetically rather isolated from the closest Carpathian populations. Also, it is very possible that the species' population in Western Stara Planina Mts (Bulgaria and Serbia) is the southernmost and peripheral in terms of the range of the species. Therefore, a strict and strong protection of the species' potential habitats – riparian forests and meadows, in Natura 2000 protected area BG0001040 – Western Stara Planina and Pre-Balkans, is necessary.

Acknowledgements

This study was carried out with the financial support of project BG16M1OP002-3.003-0001 "Analyzes and surveys of species and natural habitats, subject to reporting under Article 17 of the Habitats Directive and Article 12 of the Birds Directive", financed by Operational Programme "Environment 2014–2020", implemented by the Executive Environment Agency, a distinct position № 1: "Analyzes and surveys of species and habitat types in Bulgaria, subject to reporting under Article 17 of the Habitats Directive (92/43/EEC)".

References

Apfelbeck V. 1904 Die Käferfauna der Balkanhalbinsel, mit Berücksichtigung Klein-Asiens und der Insel Kreta. Erster Band: Familienreihe Caraboidea. R. Friedländer und Sohn, Berlin, 422 pp.

Barloy J., Prunar F. 2012 Consideration on the genus *Carabus* species protected in Romania by the Natura 2000 network. Research Journal of Agricultural Science 44 (2): 151–163.

Bekchiev R., Crevecoeur L., Gielen K., Bosmans B., Smets K., Kostova R. 2020 One hundred years of solitude: rediscovery of the rare and protected

beetle *Rhysodes sulcatus* (Fabricius, 1787) (Coleoptera: Rhysodidae) in Bulgaria. Acta Zoologica Bulgarica 72: 383–384.

Bekchiev R., Guéorguiev B., Kostova R., Chehlarov E., Sivilov O. 2018 New records of rare and threatened beetles (Insecta: Coleoptera) in Bulgaria. Acta Zoologica Bulgarica 70: 501–506.

Breuning S. 1928 Beitrag zur Carabenfauna von Bulgarien (Carabidae, Col.) mit Berücksichtigung der angrenzenden Gebiete. Mitteilungen aus den Königlichen naturwissenschaftlichen Instituten in Sofia – Bulgarien 1: 108–117.

Buresch I., Kantardjieva S. 1928 Die in Bulgarien vorkommenden Arten der Subfamilie Carabinae (Coleopt.-Carabidae). Mitteilungen aus den Königlichen naturwissenschaftlichen Instituten in Sofia – Bulgarien 1: 45–107. (In Bulgarian)

Ćurčić S.B., Brajković M.M., Ćurčić B.P.M. 2007 The Carabids of Serbia. Institute of Zoology, Monographs, Vol. XI, Institute of Zoology – Faculty of Biology – University of Belgrade, Committee for Karst and Speleology – Serbian Academy of Sciences and Arts in Belgrade, Department of Conservation Biology, Vegetation- and Landscape Ecology, Faculty of Life Sciences, University of Vienna, and UNESCO MAB Committee Serbia in Belgrade, Belgrade-Vienna, 1083 pp., 681 maps.

Drees C., Matern A., Assmann T. 2008 Behavioural patterns of nocturnal carabid beetles determined by direct observations under red-light conditions. In: Penev L., Erwin T., Assmann T. (eds) Back to the Roots and Back to the Future: Towards a New Synthesis Between Taxonomic, Ecological and Biogeographical Approaches in Carabidology Proceedings of the XIII European Carabidologists Meeting, Blagoevgrad, August 20–24, 2007. Pensoft Publishers, Sofia, 416–429.

Guéorguiev B. 2015 Coleoptera. In: Golemansky V. (ed.) Red Data Book of the Republic of Bulgaria Volume 2 Animals. BAS and MoEW, Sofia, 133–134, 353–358.

Guéorguiev V., Guéorguiev B. 1995 Catalogue of the ground-beetles of Bulgaria (Coleoptera: Carabidae). Pensoft Publishers, Series Faunistica No 2, Sofia–Moscow, 279 pp.

Matern A., Desender K.R.C., Drees C., Gaublomme E., Paill W., Assmann T. 2008 Genetic diversity and population structure of the endangered insect species *Carabus variolosus* in its western distribution range: Implications for conservation. Conservation Genetics 10: 391–405. https://doi.org/10.1007/s10592-008-9606-1

Matern A., Drees C., Meyer H., Assmann T. 2007 Population ecology of the rare carabid beetle *Carabus variolosus* (Coleoptera: Carabidae) in north-west Germany. Journal of Insect Conservation 12: 591–601. https://doi.org/10.1007/s10841-007-9096-3

Matern A., Drees C., Vogler A.P., Assmann T. 2010 Linking genetics and ecology: reconstructing the history of relict populations of an endangered Semi-Aquatic Beetle. In: Habel J.C., Assmann T. (eds) Relict Species: Phylogeography and Conservation Biology. Springer-Verlag, Berlin, 253–265. https://doi.org/10.1007/978-3-540-92160-8_14

Mossakowski D., Bérces S., Hejda R., Müller-Kroehling S., Paill W., Prunar F., Rapuzzi I. 2020 High molecular diversity in *Carabus* (*Hygrocarabus*) *variolosus* and *C. nodulosus*. Acta Zoologica Academiae Scientiarum Hungaricae 66: 147–168. https://doi.org/10.17109/AZH.66.Suppl.147.2020

Rambousek F.J. 1912 Fauna coleopterorum bulgarica. Travaux de la Societé bulgare des sciences naturelles 5: 57–113.

Turin H., Penev L., Casale A. 2003 The genus *Carabus* in Europe. A Syntesis. Pensoft Publishers, European Invertebrate Survey, Sofia, 512 pp.

Historia naturalis bulgarica 44 (10): 125–128
ISSN 2603-3186 (online) | ISSN 0205-3640 (print) · nmnhs.com/historia-naturalis-bulgarica
https://doi.org/10.48027/hnb.44.104
Publication date [online]: 14 November 2022

Research article

A new species of *Microstygia* Georgiev et Glöer, 2015 (Gastropoda: Hydrobiidae) from Bulgaria

Dilian Georgiev

Department of Ecology and Environmental Conservation, University of Plovdiv, 24 Tsar Assen Street, 4000 Plovdiv, Bulgaria,
diliangeorgiev@gmail.com; https://orcid.org/0000-0003-2885-4895

http://zoobank.org/856CC3B1-0906-453A-A4D1-8DE0962541F2

Abstract: The second known species of the genus *Microstygia* Georgiev et Glöer, 2015 was described, *Microstygia lakatnika* **n. sp.** It was found as empty shells in the deposits of the temporary stream of the Temnata Dupka Cave, Iskar River Gorge, Stara Planina Mts in Bulgaria. *M. lakatnika* **n. sp.** is a little bit larger and has one more whorl than the type species of the genus, *M. deltchevi* Georgiev et Glöer, 2015.

Keywords: Balkan Peninsula, cave, stygobiotic

Introduction

The territory of Bulgaria is one of the richest areas on stygobiotic snails in the West Palaearctic. Many endemic species and probably even genera were found in the recent years from there (Glöer, 2022). In this paper I describe a new species from the known as a monotypic genus *Microstygia* Georgiev & Glöer, 2015. It was registered in one of the relatively well studied considering stygobiotic snails water caves named Temnata Dupka, from where Wagner (1927) described two species: *Paladilhiopsis buresi* Wagner, 1928, and *Pontobelgrandiella hessei* (Wagner, 1927), and later Georgiev (2011) found it as a new locality of *Pontobelgrandiella pusilla* (Angelov, 1959).

Material and methods

The material (3 empty shells) was collected on 6.08.2022 from the Temnata Dupka Cave, Iskar River Gorge, Stara Planina Mts in Bulgaria (Fig. 1). Deposits of a temporary stream, situated at the left (north) small gallery near the entrance and close to the grating were collected (Fig. 2). Later they were sun dried and then put again into water. Floating empty shells full with air were collected by a strainer. Specimens were stored, identified and some were photographed. Taxonomy followed Glöer (2022).

Abbreviations used: SH – shell height, SW – shell width, AH – aperture height, AW – aperture width, LWH – last whorl height.

Results

Genus *Microstygia* Georgiev & Glöer, 2015

Type species: *Microstygia deltchevi* Georgiev & Glöer, 2015

The shell is white, elongate-conical to almost cylindrical fine growth lines and deep suture. The apex is strongly rounded. The aperture is ovoid with a simple lip having relatively thickened edge. The

Received: 4 November 2022; accepted: 8 November 2022 · Editor: Nikolay Simov

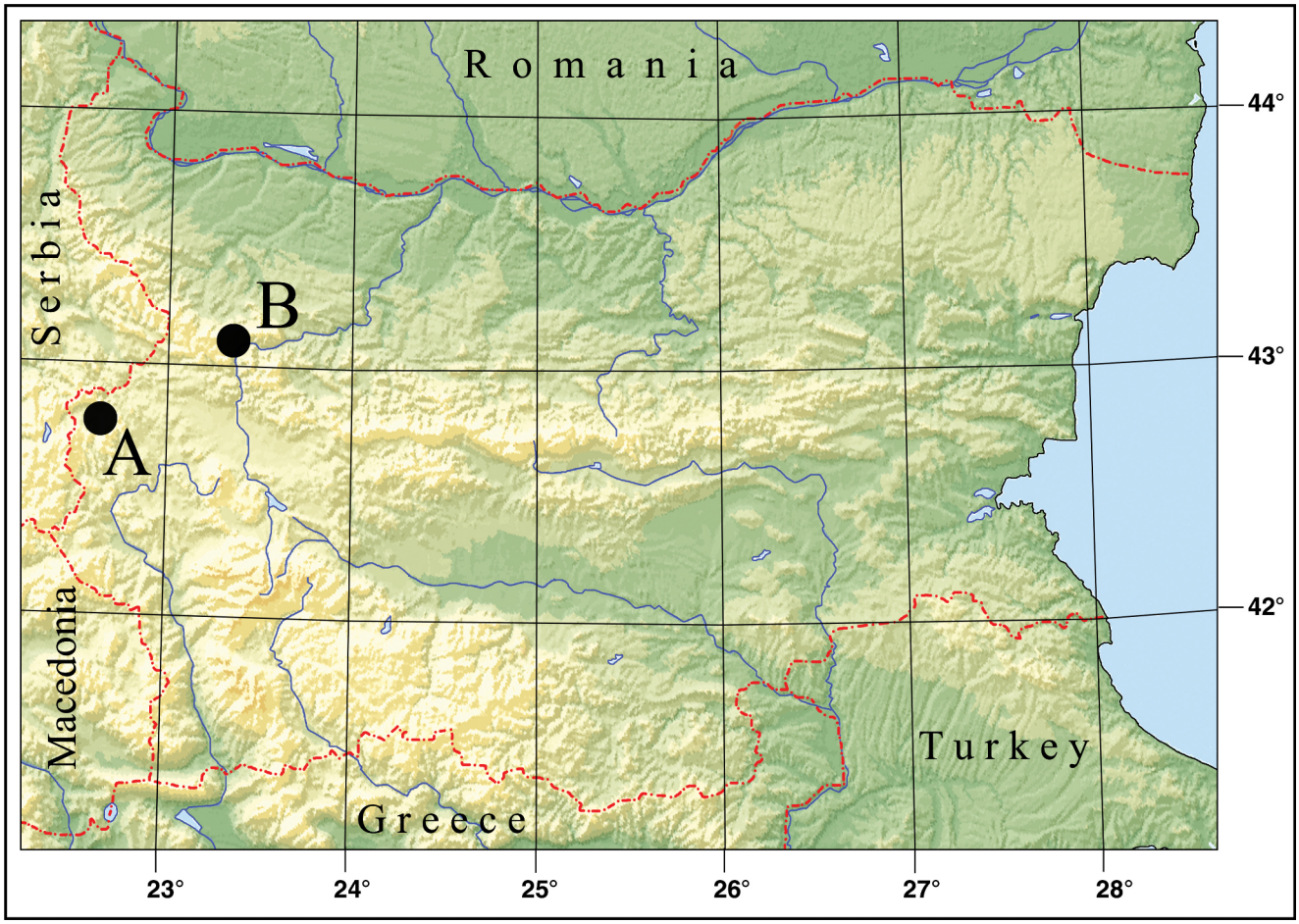

Fig. 1. Known localities of the species from the genus *Microstygia:* A – *M. deltchevi,* B – *M. lakatnika* n. sp.

operculum and the soft body are unknown (Georgiev & Glöer, 2015).

Microstygia lakatnika **n. sp.**

Type locality: Temnata Dupka Cave, near Gara Lakatnik Village, Iskar River Gorge, Stara Planina Mts, Bulgaria, N43 05 20.0 E23 23 00.5, 469 m a.s.l. (Figs 1, 2).

Type material: holotype: 1 shell, 6.08.2022, Temnata Dupka Cave, near Gara Lakatnik Village, Iskar River Gorge, Stara Planina Mts, Bulgaria, N43 05 20.0 E23 23 00.5, 469 m a.s.l., National Natural History Museum – Sofia, Bulgaria (Fig. 3B); Paratypes: 2 shells, from the type locality, 6.08.2022, National Natural History Museum – Sofia, Bulgaria.

Etymology: Named after the area of Lakatnik Rocks (= Lakatnishki Skali, Bulgarian) where the species was found.

Description: The shell is white, very small, elongate conical. The whorls are five, slightly rounded, regularly growing and have a shining surface and a deep suture. The apex is broad and rounded, the umbilicus is slit like. The aperture is ovoid with a simple lip having relatively thickened edge. The operculum and the soft body are unknown.

Measurements: Holotype: SH = 1.46 mm, SW = 0.64 mm, AH = 0.42 mm, AW = 0.44 mm, LWH = 0.80 mm, AH/SH = 0.29, LWH/SH = 0.55, SW/SH = 0.44. Paratypes: No. 1: SH = 1.34 mm, SW = 0.56 mm, AH = 0.40 mm, AW = 0.38 mm, LWH = 0.72 mm, AH/SH = 0.30, LWH/SH = 0.54, SW/SH = 0.42 (Fig. 1), No. 2: SH = 1.42 mm, SW = 0.54 mm, AH = 0.38 mm, AW = 0.32, LWH = 0.72 mm, AH/SH = 0.27, LWH/SH = 0.51, SW/SH = 0.38.

Differential diagnosis: The genus *Microstygia* differs from all the rest of the known stygobiotic genera with similar shell shape by its small size, rounded apex with very broad embryonic whorls. *M. lakatnika* n. sp.

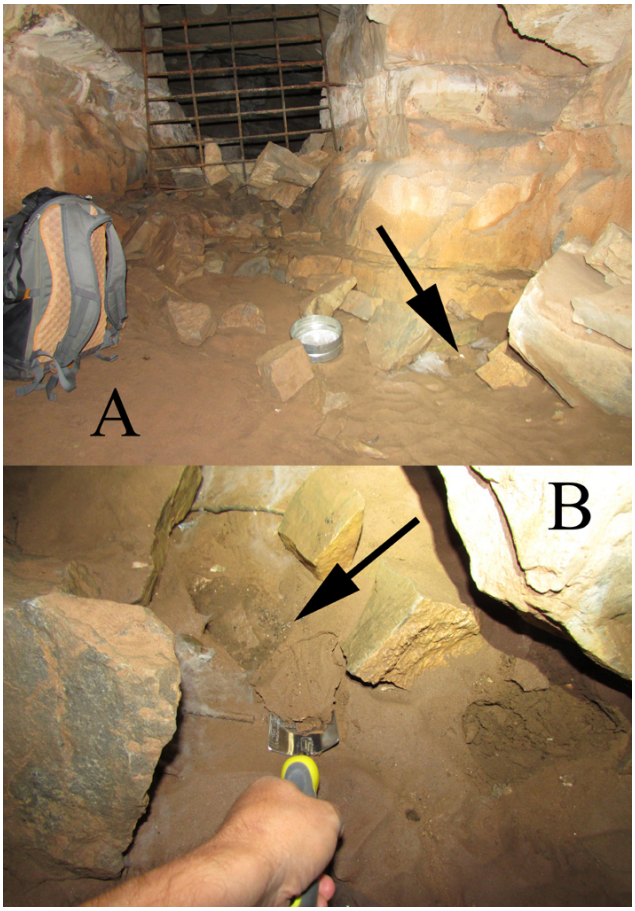

Fig. 2. Collection site at the type locality of *Microstygia lakatnika* n. sp.: A – general view of the locality with some of the author's equipment, B – close view of the locality (white spots pointed by an arrow are shells of stygobiotic snails).

differs from *M. deltchevi* (Fig. 3A) by its slightly larger shell with five whorls (versus four), and the slit like umbilicus (versus wide open). However, there are some species assigned to the genus *Iglica* Wagner, 1928 (which evidently needs a revision) that have such a small shell and broad apex like *Microstygia*. They are *I. alpheus* A. Reischütz & P. L. Reischütz, 2004 (Peloponesse, Greece) and *I. velkovrhi* De Mattia, 2007 (Klunove Toplice, Slovenia) (Glöer, 2022) but the first species has a strongly cylindrical shell (versus elongate conical), and in the second the last whorl comprises 2/3 of the shell height (versus 1/2). In addition, *I. velkovrhi* has different ecology, being a thermophile living in a hot spring.

Habitat and ecology: A stygobiotic species living in subterranean waters of a large limestone area. Other snail species found as empty shells in the sample were

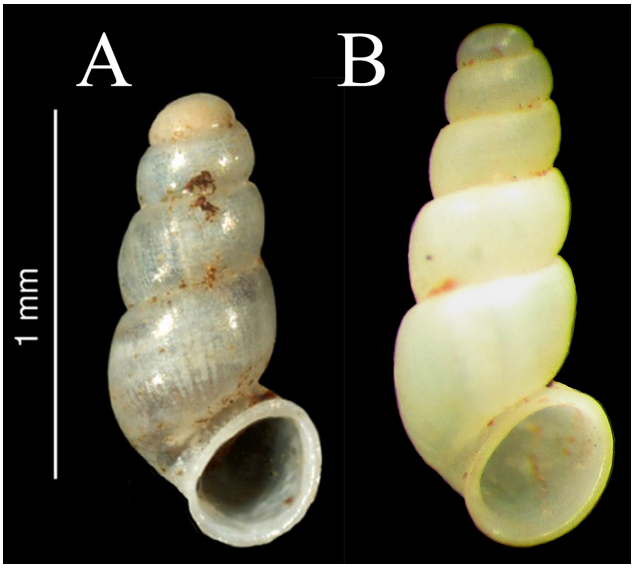

Fig. 3. Known species of *Microstygia:* A – *M. deltchevi* (by Georgiev & Glöer, 2015, photo P. Glöer), B – *M. lakatnika* n. sp., holotype (photo: D. Georgiev).

Paladilhiopsis buresi Wagner, 1927 (considered by the author as *Saxurinator* Schütt, 1960), *Pontobelgrandiella hessei* (Wagner, 1927) and *Pontobelgrandiella pusilla* (Angelov, 1959).

Acknowledgements

The trips to the caves of Iskar River Gorge were financed by project: "Consultations and assistance in the collection, analysis and interpretation of data on types of natural habitats and species for the purposes of the National System for Monitoring the State of Biological Diversity (NSMSBR) and the policy on the protection of biological diversity", according to an Agreement with National Museum of Natural History, Bulgarian Academy of Sciences and the Ministry of environment and waters reg. No. D-33-19/07/08/2022.

References

Georgiev D. 2011 New localities of four Bulgarian endemic Hydrobiidae species (Mollusca: Gastropoda: Risooidea). ZooNotes 16: 1–4.

Georgiev D., Glöer P. 2015 New taxa of subterranean freshwater snails from Bulgaria (Gastropoda, Hydrobiidae). Ecologica Montenegrina 3: 19–24.

Glöer P. 2022 The Freshwater Gastropods of the West-Palearctis, Volume 2, Moitessieriidae, Bythinellidae, Stenothyridae. Identification Key, Anatomy, Ecology, Distribution. Biodiversity Research Lab, Hetlingen, 371 pp.

Wagner A. 1927 Studien zur Molluskenfauna der Balkanhalbinsel mit besonderer Berücksichtigung Bulgariens und Thraziens, nebst monographischer Bearbeitung einzelner Gruppen. Annales Zoologici Muzei Polonici Historaie Naturalis 6 (4): 263–399.