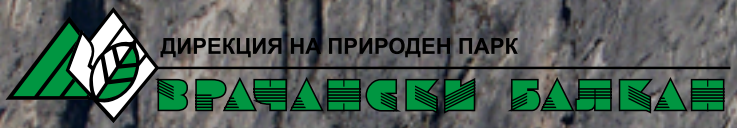
Faunistic diversity of Vrachanski Balkan Nature Park

ZooNotes Supplement 3



Dimitar Bechev and Dilian Georgiev
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Димитър Бечев и Дилян Георгиев
Редактори

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Cover photo: Vertical rock wall "Ogledalata", Vratsata Gorge, south-west of Vratsa. Photo: D. Bechev.

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Съдържание

Foreword

This issue was published by the Direction of Vrachanski Balkan Nature Park and ZooNotes journal. It includes 25 faunistic papers concerning various animal groups from this interesting area of Bulgaria. The papers summarize both already published data and original works about 1332 recent species of Acanthocephala, aquatic Gastropoda and Bivalvia, terrestrial Gastropoda, Crustacea, Scorpiones, Araneae, Tardigrada, Ephemeroptera, Odonata, Plecoptera, Orthoptera, Blattodea, Mantodea, Scarabaeoidea, Chrysomelidae, Formicidae, Trichoptera, Bolitophilidae, Diadocidiidae, Ditomyiidae, Keroplatidae, Mycetophiliade, Tabanidae, terrestriall cave invertebrated, Pisces, Amphibia, Reptilia, Aves and Mammalia, and about some fossil taxa too.

The Editors

Предговор

Това съвместно издание на Дирекция на природен парк Врачански Балкан и списание ZooNotes съдържа 25 фаунистични статии за различни групи животни от този интересен район на България. Статиите обобщават публикувани вече и представят много нови данни за 1332 рецентни вида Acanthocephala, водни Gastropoda и Bivalvia, сухоземни Gastropoda, Crustacea, Scorpiones, Araneae, Tardigrada, Ephemeroptera, Odonata, Plecoptera, Orthoptera, Blattodea, Mantodea, Scarabaeoidea, Chrysomelidae, Formicidae, Trichoptera, Bolitophilidae, Diadocidiidae, Ditomyiidae, Keroplatidae, Mycetophiliade, Tabanidae, сухоземни пещерни безгръбначни, Pisces, Amphibia, Reptilia, Aves, Mammalia и за някои фосилни таксони.

От редакторите

Bechev, D. & Georgiev, D. (Eds.),
Faunistic diversity of Vrachanski Balkan Nature Park.
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Geographic features of Vrachanska Planina Mountains

DIMITAR BECHEV, DILIAN GEORGIEV

Situation, relief, climate, soils

Vrachanska Planina Mts. is situated in North-Western Bulgaria (Fig. 1), north of the main chain of Stara Planiana Mts. with which is connected by the so called Druzhevska Sedlovina Ridge (near Druzhevo village). It is defined by the Vrachansko Pole Lowland to the north and north-east, and by Botunya and Bela Rivers to the west and by Iskar River to the south. Lowest parts of the mountain are of around 230 m altitude, and highest peak is Beglichka Mogila with 1482 m alt.

The main part of the mountain is a protected area, the Vrachanski Balkan Nature Park (28803.9 ha), and also the Vrachanski Karst Reserve (1466.5 ha).

The relief of the mountain is complex. Two main, medium sized rivers (Leva and Cherna), and a variety of smaller ones and many streams are forming deep gorges. The upper rock layers are consisted by triassic, jurassic, and cretaceous limestone and dolomites which are forming cliffs, mesas, tors, stone runs and surface karst formations.

Vrachanska Planina is one of the richest areas on caves in Bulgaria. There are over than 500 different caves and potholes with 356 m maximal depth and 1300 m length (Beron 2016).

Main soil types of the mountain are Distric-Eutric Cambisols, Gray Luvisols, and Rendzinas.

The climate of the region is temperate.

Flora and vegetation

Basic studies on the flora of Vrachanska Planina are those of Urumov (1935), Ahtarov (1936), and on the vegetation – of Velchev (1971). All information published on higher plants (without bryophites) concerning Vrachanski Balkan are summarized by Borisova and Donchev (2003): 983 species higher plants (22.5% from all known in Bulgaria), from 430 genera and 99 families. From all 5 species are Bulgarian endemics, and 20 are Balkan endemics.

In the mountain there are two well defined altitudinal zones of vegetation. The oak belt reaches 700 m alt. (on southern slopes up to 1100 m) consisting xeric floral elements. The beech belt extends almost to the highest mountain areas. In this zone the mountainous-mezophilic floral elements dominate (Velchev 1971).

There are 37 floral formations and 124 associations and groups of associations known in this mountain.

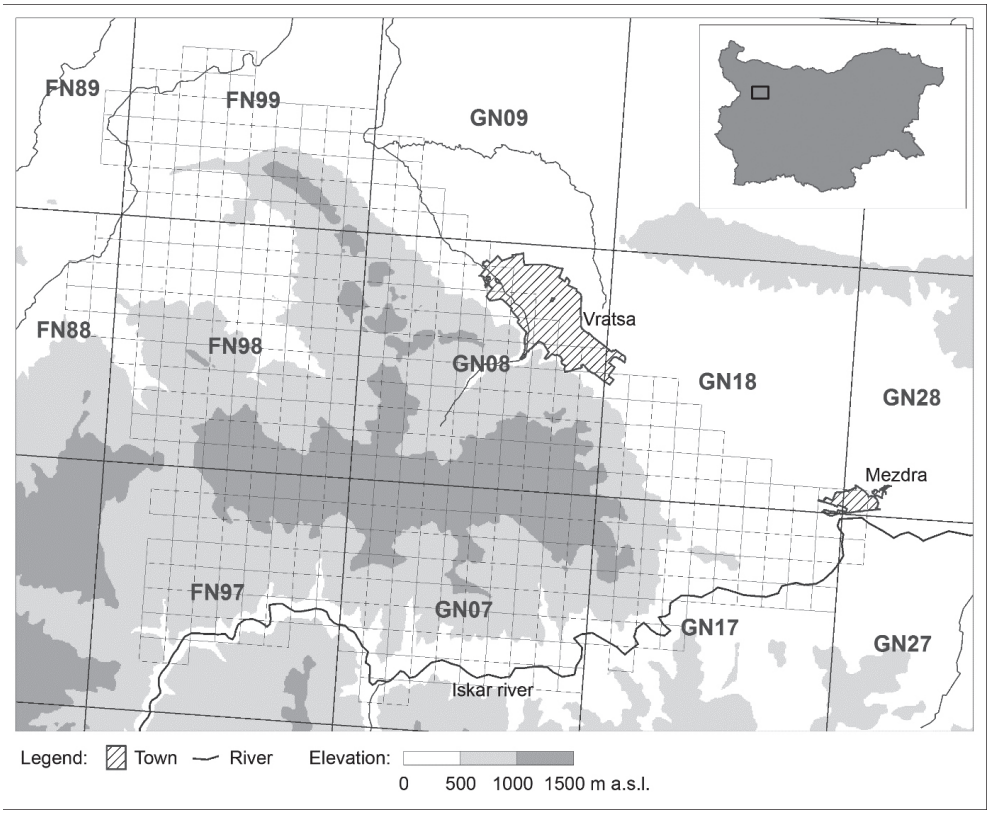

Fig. 1. Location of the study area in UTM-grid 10×10 and 1×1 km (from the one-kilometer squares are shown only the ones, in which falls the territory of Vrachanska Planina Mts.)(from Naumov *et al.* 2016).

Fauna

On the territory of the Natural Park "Vrachanski Balkan" there are 1507 animal species known till present publication (1231 invertebrates and 276 vertebrates). While the species list of the vertebrates is considered as almost complete, this one of the invertebrates can be defined as not well known. On the base of experts opinions the species of the invertebrate animals occurring in this area can be supposed to be over 5000.

From zoogeographic point of view dominate animal species groups belong to the Holarctic and the European faunal complex. Submediterranean and Mediterranean elements also present on the southern mountain slopes.

Endemics are well represented in the area (most of them troglobites).

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Географски особености на Врачанска планина

ДИМИТЪР БЕЧЕВ, ДИЛЯН ГЕОРГИЕВ

(Резюме)

Врачанска планина се намира в Северозападна България, на север от главната верига на Западна Стара планина. Най-ниските части на планината са с надморска височина около 230 m, най-висок връх е Бегличка могила (1482 m).

Голяма част от планината е в границите на Природен парк Врачански Балкан (28803,9 ха). Извън парка са предимно ниските, периферни части и териториите около селища и пътища. В границите на парка се намира резерват Врачански карст (1466,5 ха).

Релефът на планината е сложен. Две основни, неголеми реки (Лева и Черна), и множество по-малки, и потоци образуват дълбоки долове. Горните скални слоеве са от триаски, юрски и кредни варовици и доломити, образуващи отвесни стени, скални откоси и венци, сипеи и повърхностни карстови форми (валози, вртопи, кари).

Планината е един от най-богатите на пещери райони в България. Установени са над 500 пещери и пропасти с дълбочина до - 356 m и дължина до 1300 m.

Основните типове почви във Врачанска планина са 3: кафяви горски, сиви горски и хумусно-карбонатните.

Климатът на района е умерено-континентален.

В растителността на планината са обособени ясно два растителни пояса. Поясът на дъба достига до 700 m надм. в. (по южни склонове и до 1100 m). В него преобладава ксеротермния растителен елемент. Поясът на бука достига почти до най-високите точки на планината (до вторично обезлесените билни части). В него доминира планинско-мезофитния растителен елемент.

На територията на Природен парк Врачански Балкан са установени 1507 вида животни. От тях 1231 вида безгръбначни и 276 вида гръбначни животни.

В зоогеографско отношение преобладаващата част от видовете принадлежат към холоарктичния и европейския фаунистичен комплекс. Присъстват и субмедитерански и медитерански елементи, по-чести по южните склонове на планината.

От животните няколко десетки вида са български или локални ендемити. Основната причина за големия брой ендемити е наличието на богата подземна фауна.

Bechev, D. & Georgiev, D. (Eds.),
Faunistic diversity of Vrachanski Balkan Nature Park.
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Review of species of the phylum Acanthocephala recorded from Vrachanska Planina Mountains

ZLATKA DIMITROVA

Abstract. A review of acanthocephalan species recorded from the Vrachanska Planina Mountains is presented. A total of 4 species were reported: 3 from birds and 1 from mammals and 1 species has been identified at the generic level only. As hosts, 4 vertebrate species were recorded: 3 avian and 1 mammalian species. A host-parasite list is presented. The acanthocephalan species recorded in the Vrachanska Planina Mts. represent 7.5% from the species recorded in Bulgaria.

Key words: Acanthocephala, birds, mammals, review, Bulgaria.

Introduction

Most of the studies summarised in the present review aimed revealing the helminth parasites of birds (Paspalev *et al.* 1969; Kamburov 1966; Tsacheva-Petrova 1971; Dimitrova 1998; 1999). There is only one study on the acanthocephalans of mammals in the studied region (Popov *et al.* 1960). There are no investigations of the remaining host groups (fishes, amphibians and reptiles) in the Vrachanska Planina Mts.

In addition, the primary data obtained by the above-mentioned studies have also been presented in review publications on the helminth parasites from the fauna of Bulgaria. These are the survey of avian acanthocephalans (Dimitrova *et al.* 2000), the monograph on the helminth parasites of insectivores and rodents (Genov 1984) and Catalogus Faunae Bulgaricae (Acanthocephala) (Dimitrova & Georgiev in press).

The present review includes the acanthocephalan species recorded from the Vrachanska Planina Mts. and some adjacent areas until 2015. The species list is arranged according to the classification proposed by Amin (2013). In addition, data of general distribution of the reported species were presented. The nomenclature of the hosts follows Fauna Europaea: (Roselaar 2004) (birds); Bogdanowicz & Zagorodniuk (2004) (mammals).

List of acanthocephalan species

Class Archiacanthocephala Meyer, 1931

Order Gigantorhynchida Southwell & MacFie, 1925

Family Gigantorhynchidae Hamann, 1892

Genus *Mediorhynchus* Van Cleave, 1916

***Mediorhynchus rodensis* Cosin, 1971**

Recorded from small intestine of *Garrulus glandarius* (Linnaeus, 1758) at Lakatnik

(Dimitrova 1998; Dimitrova 1999; Dimitrova *et al.* 2000).

General distribution: Palaearctic: Europe (Cosin 1971; Dimitrova *et al.* 2000; Gibson 2004).

***Mediorhynchus tenuis* Meyer, 1931**

Recorded from small intestine of *Monticola saxatilis* (Linnaeus, 1758) at Iskarskoto Defile (Kamburov 1966; Dimitrova *et al.* 2000).

General distribution: Palaearctic: European-Mediterranean (Khokhlova 1986; Dimitrova*et al.* 2000).

***Mediorhynchus zosteropis* (Porta, 1913)**

Recorded from small intestine of *Corvus cornix* Linnaeus, 1758 at Vratsa (Tsacheva-Petrova 1971; Dimitrova *et al.* 2000).

General distribution: Australian (New Caledonia) and Palaearctic (Khokhlova 1986; Golvan 1994; Dimitrova*et al.* 2000).

***Mediorhynchus* sp.**

Recorded from small intestine of *Corvus cornix* at Varshets (Paspalev *et al.* 1969).

Order Oligacanthorhynchida Petrochenko, 1956

Family Oligacanthorhynchidae Southwell and MacFie, 1925

Genus *Macracanthorhynchus* Travassos, 1917

***Macracanthorhynchus hirudinaceus* (Pallas, 1781)**

Recorded from small intestine of *Sus scrofa* f. *domestica* Linnaeus, 1758 at Vratsa (Popov *et al.* 1960).

General distribution: Holarctic, Palaeotropical (Genov 1984, Khokhlova 1986; Araki 2003), Neotropical (Mexico) (Salgado-Maldonado 2005) and Australian (Smales 2003).

Host-parasite checklist

Class Aves
Order Passeriformes
Family Saxicolidae
Monticola saxatilis (Linnaeus, 1758)
Mediorhynchus tenuis
Family Corvidae
Corvus cornix Linnaeus, 1758
Mediorhynchus zosteropis
Mediorhynchus sp.
Garrulus glandarius (Linnaeus, 1758)
Mediorhynchus rodensis
Class Mammalia
Order Artiodactyla
Family Suidae
Sus scrofa f. *domestica* Linnaeus, 1758
Macracanthorhynchus hirudinaceus

Discussion

As seen from the above survey, 4 acanthocephalan species were recorded from the Vrachanska Mts and some adjacent areas. In addition, 1 species has been identified at the generic level only. Three of the acanthocephalan species are from avian hosts and 1 from mammals. The acanthocephalans recorded belong to 2 genera, 2 families, 2 orders and 1 class. As definitive hosts, 4 vertebrate species have been recorded. These are 3 avian and 1 mammalian species.

According to Dimitrova & Georgiev (in press) 53 acanthocephalan species were recorded for the fauna of Bulgaria. The acanthocephalan species recorded in the Vrachanska Planina represent 7.5% from the species recorded in Bulgaria. The expected number of species of this group is probably about 18-20. Further studies are needed on new vertebrate hosts (birds, fish, mammals, amphibians, reptiles) of acanthocephalans in the Vrachanska Planina Mts.

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Преглед на видовете от тип Acanthocephala, съобщени от Врачанска планина

ЗЛАТКА ДИМИТРОВА

(Резюме)

Представен е преглед на видовете акантоцефали, съобщени от Врачанска планина и някои прилежащи територии. Съобщени са 4 вида акантоцефали: 3 от птици и 1 от бозайници. Четири вида гръбначни животни са съобщени като гостоприемници на установените видове акантоцефали: 3 вида птици и 1 вид бозайници. Представени са също и данни за общото разпространение на установените видове. Включен е списък на гостоприемниците на акантоцефалите, установени във Врачанска планина. Установените видове акантоцефали представляват 7.5% от общия брой видове, съобщени за България.

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The aquatic molluscs (Mollusca: Gastropoda and Bivalvia) of Vrachanski Balkan Nature Park

DILIAN GEORGIEV

Abstract. Till now 13 species of aquatic molluscs are known to inhabit the park area: 11 species of snails and 2 species of clams. Even included in the list the species of *Grossuana* and *Radix balthica* has to be studied anatomically for sure identification. Nine species are of conservation statute classified as "Least Concern" or "Vulnerable", and four does not have any statute. Three stygobiotic snail species are local endemics.

Key words: freshwater, molluscs, karstic area, Bulgaria.

Introduction

History of research

First data on the freshwater molluscs of Vrachanska Planina Mountains area was provided by Wagner (1927) describing two new stygobiotic snail species found as empty shells at Temnata Dupka Cave near Lakatnik.

Angelov (1959, 1972) described another two species from Petrenski Spring:

Urbański (1960) re-sampled the Temnata Dupka Cave for stygobiotic snails, and found the species described previously by Wagner.

Radoman (1983) reported on findings of *Grossuana serbica* Radoman, 1973 from this part of Stara Planina Mts.

Beron (1994) reported the freshwater clam *Pisidium personatum* Malm, 1855 from the Temnata Dupka Cave.

Further research provided data on molluscs of the nearby Iskar River but not from the mountain area (Russev *et al.*, 1994; Russev et al. 1998).

In his synopsis Angelov (2000) considered *P. bureschi copiosus* as junior synonym of *P. bureschi*.

Hubenov (2007, unpublished report) made a synopsis of the malacofauna of the area, and reported some new findings of freshwater molluscs.

Georgiev (2011) re-sampled the Temnata Dupka Cave for stygobiotic snails again, and among previously reported species, found also shells of *Belgrandiella pussila*. The author assigned *Paladilhiopsis bureschi* to the genus *Bythiospeum* Bourguignat, 1882.

Material and Methods

A synopsis and a critical overview of the literature concerning the freshwater molluscs of the park area were made.

The Vrachanski Balkan was visited two times during 2012 and 2014 for terrain survey. The collected shell material was deposited in the collections of the author and the

Regional Natural History Museum – Plovdiv.

The nomenclature follows Glöer & Meier-Brook (2003). Conservation statute was considered according Cuttelod *et al.* (2011).

Results and Discussion

Original data represented very few mollusc finds: *Ancylus fluviatilis* was find at Petrenski Izvor but *Belgrandiella pussila* was not collected even after intensive sieving of the spring deposits. The species *Bythiospeum bureschi* and *Belgrandiella hessei* were re-sampled during two visits of Temnata Dupka Cave but never found as live specimens. No any stygobiotic snails were found at Kalna Matnitsa Cave but material of *Grossuana* sp. was collected from the outer spring some years ago by Nikolay Simov and provided to the author for study.

Till now 13 species of aquatic molluscs are known to inhabit the park area: 11 species of snails and 2 species of clams (Table 1). Even included in the list the species of *Grossuana* and *Radix balthica* has to be studied anatomically for sure identification. Possibly the *Bythinella* species is new to science and also has to be investigated. Cave malacofauna could provide some other new species inhabiting the subterranean waters.

Table 1. Aquatic molluscs known to inhabit the area of the park. Legend: LC – Least concern, VU – Vulnerable.

Species	Locality	Author	IUCN
Gastropoda			
Valvata piscinalis (Müller, 1774)	Small rivers near Gara Lakatnik Vill.; above Vratsa town	Hubenov (2007)	LC
Holandriana holandrii (C. Pfeiffer, 1828)	Small rivers above Vratsa	Hubenov (2007)	LC
Bythinella sp.	"Ledenika" complex	Hubenov (2007)	
Belgrandiella hessei Wagner, 1927	Temnata Dupka Cave	Wagner (1927); Urbański (1960)	VU
Belgrandiella pussilla Angelov, 1959	Petrenski Izvor; Temnata Dupka Cave	Angelov (1959); Georgiev (2011)	VU
Bythiospeum bureschi (Wagner, 1927)	Temnata Dupka Cave	Wagner (1927); Urbański (1960); Georgiev (2011)	VU
Grossuana sp. (?)	Spring at "Ledenika" complex; outer stream of Kalna Matnitsa Cave	Hubenov (2007); present publication	
Radix balthica (Linnaeus, 1758) (?)	Everywhere up to 2500 m a.s.l.	Hubenov (2007)	LC
Radix labiata (Rossmässler, 1835)	Everywhere up to 2500 m a.s.l.	Hubenov (2007)	LC
Galba truncatula (Müller, 1774)	Everywhere up to 2500 m a.s.l.	Hubenov (2007)	
Ancylus fluviatilis Müller, 1774	Many localities up to 2300 m a.s.l.; Petrenski Izvor at Petrenska River	Hubenov (2007); present publication	
Bivalvia			
Pisidium casertanum (Poli, 1791)	One of the commonest species at the mountains, springs and caves	Hubenov (2007)	LC
Pisidium personatum Malm, 1855	Temnata Dupka Cave	Beron (1994); Hubenov (2007)	LC

Nine species are of conservation statute classified as “Least Concern” or “Vulnerable”, and four does not have any statute. The three stygobiotic snail species are local endemics.

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Сладководните мекотели на Природен парк Врачански Балкан

ДИЛЯН ГЕОРГИЕВ

(Резюме)

Известни са общо 13 сладководни вида мекотели от територията на парка: 11 вида охлюви и 2 вида миди. Два вида (*Grossuana* sp. и *Radix balthica*) са под въпрос поради липса на анатомични изследвания, а един вид (*Bythinella* sp.), вероятно е нов за науката. Девет от видовете са с корсервационен статут в IUCN категория "Least Concern" или "Vulnerable".

Bechev, D. & Georgiev, D. (Eds.),
Faunistic diversity of Vrachanski Balkan Nature Park.
ZooNotes, Supplemen 3, Plovdiv University Press,
Plovdiv, 2016

Contribution to the knowledge of the terrestrial gastropods (Mollusca:Gastropoda) from Vrachanska Planina Mountains

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FABIA KNECHTLE GLOGGER

Abstract. Gastropods fauna from the Vrachanska Planina Mountains (= Vrachanska Planina), Northwest Bulgaria, as well it presents the up to now unpublished results of several research trips of the authors and further collectors in the region. In total 90 terrestrial gastropods species are now known from this mountain area. 78 species were published from the beginning of research in this area up to recently. 56 species were confirmed with new findings and 22 species were not found again while the courses of our investigations. 12 gastropod species are newly recorded for the range.

Key words: Bulgaria, Vrachanska Planina Mountains, terrestrial gastropods.

Introduction

From the beginning of the 20th century until present, 28 authors have published 40 studies concerning the Vrachanska Planina Mts. gastropods fauna. Until the present work 78 terrestrial gastopods species are known to live in this restricted northwestern area of the Stara Planina Mountains Ridge. The Vrachanska Mts. are in shape of an inverted triangle, with about side lengths of 20 and 22 km and a base of 30 km only.

In the course of our studies 56 species were confirmed and summarised in Table 2. The present work is adding 12 new species for the region. The new number of 90 species for the Vrachanska Mts. represents about 32% of the 280 terrestrial gastropods species known for Bulgaria (Mitov and Dedov 2014).

For the region, we consider the following 9 species as erroneously reports or misidentifications. These are not included in the new list and numbers: *Zebrina varnensis* (L. Pfeiffer, 1847) – Wohlberedt (1911), Cherepishki Monastery; *Mastus carneolus* (Mousson, 1863) – Wagner (1927), Cherepishki Monastery; *Lehmannia marginata* (O. F. Müller, 1774) – Oshanova (1964), Damjanov and Likharev (1975), 5 km SE of Vratsa, Dabnika area, below Veslets; *Bulgarica fraudigera* (Rossmässler, 1839) – Pinter (1968), Sajo (1968), Damjanov and Likharev (1975), Lakatnik, SE of railway station; *Laciniaria bajula* (A. Schmidt, 1868) – Sajo (1968), Vratsa town; *Bulgarica rugicollis carissima* (Rossmässler, 1839) – Urbanski (1969), Vrachanska planina; *Bulgarica vetusta* (Rossmässler, 1836) – Urbanski (1969), Damjanov and Likharev (1975), Ledenika; *Bulgarica bulgariensis bulgariensis* (L. Pfeiffer, 1848) – Damjanov and Likharev (1975), from village Lakatnik to Veliko Turnovo; *Vitrea subrimata* (Reinhardt, 1871) – Damjanov and Likharev (1975), Ledenika. Probably a part of the species and subspecies has been labeled with the wrong locallity names (*B. rugicollis carissima*, *M. carneolus*, *Z. varnensis*), while others are identification errors (*B. bulgariensis*

bulgariensis, *B. fraudigera*, *B. vetusta*, *L. bajula*, *L. marginata*, *V. subrimata*). None of the species mentioned here ever where found in the wider surroundings of the Vrachanska Mts..

Notwithstanding the relative high number of species, past and present research efforts were concentrated mainly on 4 lime-stone localities near to the main roads: area of Vratsata, area near the cave Ledenika, the lime stone cliffs Ritlite in the Iskar Gorge and surroundings of the village Lakatnik (see Table 1 and 2.). Therefore we have to consider the whole area of the Vratsa Mountains as not studied systematically and more species are to be expected in future.

Material and Methods

The present study summarizes all information available from literature up to now and gives new data for the terrestrial malacofauna of the region of the Vratchanska Mts..

Collecting of the material was done by hand-collecting at day and night and the soil-sifting method was used. The morphological examinations were carried out with a stereo-microscope. Because of many collectors and different spellings of locality names, all data for localities were summarized and simplified in Table 1. The full names of the species are given in the Table 2. The specimens (= shelled gastropods) are stored in Collection I. Dedov, Bulgaria, Sofia, Institute of Biodiversity and Ecosystem Research, Bulgarian Academy of Sciences (= BG Catalogue Number) as well partly in the Collection U. E. Schneppat (= species of slugs), Bündner Naturmuseum, CH-7000 Chur, Switzerland. Taxa of slug species newly found and which are published with cf. are determined from exterior characters only.

Results and Discussion

The new total number of the terrestrial gastropods known from the Vratchanska Mts. now is 90. Among them, 12 are newly recorded for the mountains as well as 56 previously published for the region were confirmed (Table 2). The richest family is Clausiliidae (11 species) which easily can be explained with the limestone rock formations of the most studied habitats (rocks – Lakatnik, Ritlity and Vratsata and deciduous forests on limestone-rock base – area of Ledenika cave). For the same reason the number of the species of some further and less common families are well represented: Vertiginidae – 5 species, Argnidae – 4 species, Chondrinidae – 2 species, etc. In deciduous forests as well as in shadowed gorges and in the soil below rocks some predominantly subterranean families of snails and slugs are also well represented: Oxychilidae – 8 species, Pristilomatidae – 3 species, Agriolimacidae – 6 species, Arionidae – 4 species, Limacidae – 4 species, Milacidae – 4 species, etc. (Tabable 3).

In concern of the terrestrial gastropods, the region of Vrachanska Mts. have a high conservation value. Among all known terrestrial gastropods for the region, 21 species are included in “The IUCN Red List of Threatened Species” (=23%), one (*A. langaleta*) in category “NT” – near threatened, one (*C. acicula*) in category “DD” – Data Deficient and 19 in category “LC” – Least Concern. Another two species (*H. lucorum* and *H. pomatia*) are objects of the Bulgarian conservation legislation, as they are included in Section III (Regulated use of plant and animal species), Art. 41 (1), Annex 4 of the “Biodiversity Act” (State Gazette, 2002).

Table 1. Localities of newly published data and species collected.

№	Catalogue No.	Coordinates	Locality	Date / Leg.	Species
1.	BG990, BG991	UTM: GN 08, GN 09, GN 18, GN 19	Vratsa district, Vratchanska Dolina	11.08.1995 / Z. P. Eröss; 04.2001 / Z.P.Eröss	*A. vratzatica, M. pinteri*
2.	BG1075 , BG1211, BG1251, 2007/128, 2014/16, 2014/18	UTM: GN 08: 43°11'26.90"N 23°31'49.30"E, 447 m.	Vratsata-gorge, W of Vratsa, at limestone rocks (= Vratsa district, along road to Sgorigrad, steep and dry habitat with little grass vegetation)	21.06.2005 / I. Dedov; 23.05.2007 / I. Dedov and P. Subai; 29.09.2014 / U. Schneppat, F. Knechtle, I. Dedov	*A. minor, A. biplicata euptychia, A. vratzatica, A. parreyssii, A. bulgarica, C. trizona, C. acicula, C. vindobonensis, C. arcadica bulgarica, C. lubricella, D. brevipes, D. rufa, D. cf. leave, F. fruticum, H. albescens, H. lucorum, M. frauenfeldi regia, M. marginata, M. pinteri, M. glabra, O. annularis, P. similis, P. rivularis, P. sterrii, P. pusilla, Sph. doliolum, T. cylindrica, V. costata, V. pulchella, V. pusilla, V. contracta, V. diaphana, V. pellucida, Z. detrita*
3.	BG665, BG669, BG952, BG966	UTM: GN 08	Vratsa district, near "Dom na alpinista" hut, open terrain, on rocks	10.04.1997 / S. Lazarov; 10.04.1998 / I. Dedov; 09.05.1999 / S. Lazarov	*A. biplicata euptychia, A. vratzatica, C. trizona, C. arcadica bulgarica, M. pinteri, Monacha sp.*
4.	BG1212, BG1239, BG1252, 2007/127, 2014/1, 2014/2	UTM: GN 08: 43°12'12.2"N 23°29'24.2"E, 904 m; 43°12'12.16"N 23°29'24.21"E, 886 m; 43°12'16.94"N 23°29'19.50"E, 888 m.; 43°12 16.94N23°29 28.97E, 864 m.; 4"N23°29'28.96"E, 864 m.	Vratsa district, near Ledenika cave, mixed forest, Fagus, Quercus, Pinus nigra, limestone (=Vratsa district, near Ledenika cave, deciduous forest, limestone=Ledenika, about 160m SE of Ledenika Restaurant/-hut in the forest, mixed leaf bearing forest with Fagus sylvatica dominating and some Sambucus nigra, Carpinus betulus, on very moist lime stone slope=Ledenika, Ledenika Restaurant/-hut, Granite wall near Restaurant=Ledenika, along the way from Ledenica hut to Ledenika cave, habitat is a roadside along Picea abies-forest and meadows with limestone boulders)	20-21.06.2005 / I. Dedov; 22.05.2007 / I. Dedov and P. Subai; 29.09.2014 / U. Schneppat, F. Knechtle, I. Dedov	*A. pura, A. biplicata euptychia, A. vratzatica, A. bulgarica, A. cf. fasciatus, A. cf. silvaticus, A. cf. subfuscus, C. tridentatum, C. trizona, C. laminata, Deroceras cf. leave, D. cf. reticulatum, Deroceras cf. turcicum, E. fulvus, E. strigella, F. fruticum, H. lucorum, H. pomatia, L. plicata, L. flavus, L. cf. cinereoniger, M. marginata, M. obscura, Monacha sp., M. incarnatus, P. similis, P. cephalonica, Sph. doliolum, T. budapestensis, T. kusceri, V. ranojevici, V. diaphana*

5.	BG001, BG156, BG185, BG214, BG274, BG375, BG404, BG437, BG484, BG485, BG1015, BG1038, BG1206, BG1244, BG1282, BG1316, BG1320, BG1321, BG1324, 2007/125	UTM: FN 97	Iskar River Gorge, Svoge district, village. Lakatnik, western bank of the river, mixed forest (= Iskar River Gorge, Svoge district, village Lakatnik, near waterfall, below cave, road to and around the cave Temnata Dupka, limestone rocks = Iskar River Gorge, Svoge district, village Lakatnik, near river = Gara Lakatnik at the N-bank of Iskar river, at limestone rocks beside cave)	Data? / T. Stefanov; 04.1992 / I. Dedov; 04.1994 / I. Dedov; 04.1995 / P. Mitov; 1995 / I. Dedov; 04 .04.1997 / V. Antonova; 05.10.1997 / A. Aspahuhova; 11.03.2000 / V. Antonova; 29.07.2000 / I. Dedov; 29.10.2005 / I. Dedov; 22.05.2007 / I. Dedov and P. Subai	*A. pura, A. biplicata euptychia, A. langaleta, A. macrodonta, B. varnensis, C. balcanica, C. vindobonensis, C. arcadica bulgarica, E. strigella, F. fruticum, H. lucorum, L. girva, M. frauenfeldi sigma, M. inopinata, M. glabra, P. similis, P. rivularis, P. pygmaeum, Sph. doliolum, T. serbica, T. claustralis, T. cylindrica, V. diaphana, Z. detrita*
6.	2007/126, 2008/178	UTM: GN 17	„Ritlite“-gorge (= NE of Cherepiški monastery, W of Lyutibrod), limestone rocks at the S-bank of Iskar river („Ritlite“, 500-700 m E of Cherepishki monastery, limestone rocks)	22.05.2007 / I. Dedov and P. Subai; 05.05.2008 / P. Subai	*A. pura, A. biplicata euptychia, A. armata, A. langaleta, A. parreyssii, B. hiltrudae, C. balcanica, C. vindobonensis, C. arcadica bulgarica, C. lubricella, F. fruticum, G. frumentum, H. albescens, H. lucorum, L. girva, M. frauenfeldisigma, M. inopinata, M. obscura, M. glabra, O. annularis, P. similis, P. rivularis, P. pusilla, Sph. doliolum, T. cylindrica, V. costata, V. pulchella, V. pusilla, V. contracta, V. diaphana, Z. detrita*

Table 2. Terrestrial gastropods of Vrachanska Planina Mts.. In every cell of the column "Authors" the authors are in chronology by data of publications. In the column "Localities" the localities are in alphabetical order and separated with ";". Localities from literature are written, while the localities of newly collected materials are given with numbers. The numbers of localities in the last column ("Localities") correspond with the numbers of the first column of Table 1 ("№"). All rows of species which are new for the region are marked with color.

№	Species	Authors	Localities
1	*Agardhiella armata* (Clessin 1887)	Subai (2011)	Ritlite (=NE of Cherepishki Monastery); **№ 6**
2	*Agardhiella langaleta* Subai 2011	Subai (2011)	Lakatnik; Ritlite (=NE of Cherepishki Monastery); **№ 5; 6**
3	*Agardhiella macrodonta* (P. Hesse 1916)	Urbanski (1960 a), Damjanov and Likharev (1975), Irikov and Georgiev (2008), Subai (2011)	Lakatnik; **№ 5**
4	*Agardhiella parreyssii* (L. Pfeiffer 1848)	Urbanski (1960 a, 1969), Pinter and Pinter (1970), Subai (2011)	Lakatnik; Ledenika cave; Vratsa; Vratsata; Ritlite (=NE of Cherepishki Monastery); **№ 2; 6**
5	*Aegopinella minor* (Stabile 1864)	Urbanski and Wiktor (1968), Pinter, L. (1968), Pinter and Pinter (1970)	Lakatnik; Vratsata; **№ 2**
6	*Aegopinella pura* (Alder 1830)	present work	**№ 4; 5; 6**
7	*Alinda biplicata euptychia* (Ehrmann 1960)	Urbanski and Wiktor (1968), Oshanova (1968); Pinter (1968); Sajo (1968), Hudec and Vašatko (1971), Nordsieck, H. (1974, 2008); Urbanski (1977)	Cherepish; Iskrets; Lakatnik, Ledenika cave; Medkovets; Ritlite; Veslets; Vratsa; Vratsa 7 km towards Ledenika; Vratsata; Zgorigrad; **№ 2; 3; 4; 5; 6**
8	*Alinda vratzatica* (Likharev 1972)	Sajo (1968), Nordsieck, H. (1974, 2008), Damjanov and Likharev (1975)	Bistrets near Vratsa; Cherepish; Ledenika; Medkovets; Ritlite; Vratsa; Vratsata **№ 1; 2; 3; 4**
9	*Arion* cf. *fasciatus* (Nilsson 1823)	present work	**№ 4**
10	*Arion* cf. *lusitanicus* J. Mabille 1868	Oshanova (1964, 1968, 1970, 1972), Altena (1971), Wiktor (1983)	Dabnika area, 5 km SE of Vratsa, below Veslets; Vratsa, Veterinary Institute, Leva river valley

11	*Arion silvaticus* Lohmander 1937	Urbanski and Wiktor (1968), Oshanova (1968, 1970), Wiktor (1983)	Dabnika area, Vratsa district; Lakatnik, Ledenika cave; Purshevitsa; Veslets; Vratsa; **№ 4 (cf.)**
12	*Arion subfuscus* (Draparnaud 1805)	Wiktor (1983)	Milanovo; Purshevitsa; **№ 4 (cf.)**
13	*Aspasita bulgarica* Subai & Dedov 2008	Urbanski (1964, 1969), Damjanov and Likharev (1975), Subai and Dedov (2008)	Ledenika (= W of Vratsa), on limestone rocks next to the cave; Vratsata gorge W of Vratsa, on limestone rocks; **№ 2; 4**
14	*Bulgarica hiltrudae* H. Nordsieck. 1974	Nordsieck, H. (1974), Damjanov and Likharev (1975)	Cherepish; **№ 6**
15	*Bulgarica varnensis* (L. Pfeiffer 1848)	Oshanova (1968), Pinter, L. (1968), Sajo (1968), Nordsieck, H. (1974)	Bistrets; Veslets; Vratsa; **№ 5**
16	*Candidula rhabdotoides* (A. J. Wagner 1928)	Damjanov and Likharev (1975)	Lakatnik
17	*Carychium minimum* O. F. Müller 1774	Urbanski (1960 b)	Lakatnik
18	*Carychium tridentatum* (Risso 1826)	present work	**№ 4**
19	*Carpathica stussineri* (A. J. Wagner 1895)	Riedel (1967)	Ledenika cave; between Vratsa and hut Purshevitsa and cave Ledenika
20	*Cattania balcanica* (L. Pfeiffer 1843)	A.J.Wagner (1927), Knipper (1939), Urbanski (1960 b, 1978), Damjanov and Likharev (1975)	Gorna Bela Retschaka near Vratsa; Lakatnik; Ledenika cave; between Osikovo and Gorna Bela Retschaka, near Vratsa; **№ 5, 6**
21	*Cattania trizona* (Rossmässler 1835)	Urbanski (1960 b), Urbanski and Wiktor (1968), Pinter (1968), Urbanski (1977)	Lakatnik (?); Vratsa; Vratsata; **№ 2; 3; 4**
22	*Cecilioides acicula* (O. F. Müller 1774)	present work	**№ 2**
23	*Cepaea vindobonensis* (C. Pfeiffer 1828)	Knipper (1939), Oshanova (1968), Pinter, L. (1968)	Lakatnik, Veslets; **№ 2; 5; 6**
24	*Chilostoma pelia* (P. Hesse 1912)	Urbanski (1960 b), Pinter, L. (1968), Kroupa (1994)	Lakatnik
25	*Chondrina arcadica bulgarica* H. Nordsieck 1970	Pinter (1968), Pinter and Pinter (1970), Urbanski (1977)	Vratsata; **№ 2; 3; 5; 6**
26	*Chondrula tridens* (O. F. Müller 1774)	Pinter and Pinter (1970), Wohlberedt (1911)	Cherepishki Monastery; Lakatnik
27	*Cochlicopa lubricella* (Rossmässler 1834)	Urbanski (1960 b), Oshanova (1968), Pinter, L. (1968), Pinter and Pinter (1970), Damjanov and Likharev (1975)	Lakatnik; Veslets; Vratsata; **№ 2; 6**

28	*Cochlodina laminata* (Montagu 1803)	Damjanov and Likharev (1975), Urbanski (1977)	Ledenika; Vratsata; **№ 4**
29	*Daudebardia brevipes* (Draparnaud 1805)	Riedel (1967), Oshanova (1968), Pinter, L. (1968)	Veslets; Vratsa; **№ 2**
30	*Daudebardia rufa* (Draparnaud 1805)	Riedel (1967); Oshanova (1968), Pinter, L. (1968)	Lakatnik; Lakatnik village, Zidanka cave; Veslets; Vratsa; between Vratsa and huts Purshevitsa and Ledenika; **№ 2**
31	*Deroceras laeve* (O. F. Müller 1774)	Wiktor (1983)	Lakatnik; **№ 2 (cf.); 4 (cf.)**
32	*Deroceras reticulatum* (O. F. Müller 1774)	Oshanova (1964, 1970, 1972), Wiktor (1983)	Ledenika; Purshevitsa; Vratsa; Vratsa, Veterinary Institute, Leva river valley **№ 4 (cf.)**
33	*Deroceras sturanyi* (Simroth 1894)	Wiktor (1983)	Lakatnik
34	*Deroceras turcicum* (Simroth 1894)	Wiktor (1983)	Lakatnik, Ledenika; **№ 4 (cf.)**
35	*Deroceras zilchi* Grossu 1969	Wiktor (1983)	Lakatnik
36	*Deroceras* (*Liolytopelte*) *bureschi* (H. Wagner 1934)	Wagner (1934 a), Urbanski and Wiktor (1968), Hudec and Vašatko (1971), Oshanova (1970, 1972), Wiktor (1983)	Lakatnik; Ledenica cave; Mednik cave, near copper mine Plakalnitsa, 1100m; Purshevitsa; Vratsa; Vratsata, Vratsa distr.; Zgorigrad
37	*Euconulus fulvus* (O. F. Müller 1774)	present work	**№ 4**
38	*Euomphalia strigella* (Draparnaud 1801)	Urbanski (1960 b), Hudec (1965), Urbanski and Wiktor (1968), Oshanova (1968), Pinter (1968)	Lakatnik; Veslets; Vratsata **№ 4; 5**
39	*Fruticicola fruticum* (O. F. Müller 1774)	Urbanski (1960 c), Oshanova (1968), Pinter and Pinter (1970)	Lakatnik; Veslets; **№ 2; 4; 5; 6**
40	*Granaria frumentum hungarica* (M. von Kimakowicz 1890)	Feher, Deli, Solymos (2010)	Cherepishki Monastery; Ritlite; **№ 6**
41	*Helix albescens* Rossmässler 1839	Neubert (2014)	"Ritlite", 500–700 m E of Cerepiski Monastir, 43.0933 23.6247, 425 m; **№ 2; 6**
42	*Helix lucorum* Linnaeus 1758	Neubert (2014)	"Ritlite", 500–700 m E of Cerepiski Monastir, 43.0933 23.6247, 425 m alt. ; Gara Lakatnik, Iskar River; **№ 2; 4; 5; 6**
42	*Helix pomatia* Linnaeus 1758	Urbanski (1960 c), Oshanova (1968), Zapryanov (2006), Neubert (2014)	Lakatnik; Ledenika; Veslets; Vratsata; **№ 4**
44	*Laciniaria plicata plicata* (Draparnaud 1801)	Nordsieck, H. (1974, 2008), Urbanski (1977)	Bistrets; Ledenika cave; Vratsata; **№ 4**

45	*Lehmannia nyctelia* (Bourguignat 1861)	Oshanova (1964, 1968, 1970, 1972), Damjanov and Likharev (1975), Wiktor (1983)	Dabnika area, 5 km SE of Vratsa, below Veslets; Ledenika; Purshevitsa; Veslets; Vratsa
46	*Limacus flavus* (Linnaeus 1758)	Oshanova (1970)	Vratsa; **№ 4**
47	*Limax cinereoniger* Wolf 1803	Oshanova (1964, 1968, 1970, 1972), Urbanski and Wiktor (1968), Wiktor (1983)	Dabnika area, 5 km SE of Vratsa, below Veslets; Lakatnik, Ledenika; Veslets; Zgorigrad S of Vratsa; **№ 4 (cf.)**
48	*Limax maximus* Linnaeus 1758	Oshanova (1970), Wiktor (1983)	Lakatnik
49	*Lindholmiola girva* (Frivaldszky 1835)	Oshanova (1968), Pinter (1968), Subai and Neubert (2014)	Lakatnik, Veslets; 2.5 km from Gara Lakatnik towards Milanovo, UTM FN 97, 43.10°N 23.39°E; **№ 5; 6**
50	*Lindholmiola pirinensis* S.H.F. Jaeckel 1954	Subai and Neubert (2014)	Lakatnik
51	*Macedonica frauenfeldi regia* H. Nordsieck 1974	Wagner (1927), Nordsieck, H. (1974)	Bistrets; Cherepish; Cherepishki Monastery; Medkovets; Vratsa; **№ 2**
52	*Macedonica frauenfeldi sigma* (Westerlund 1884)	Jaeckel (1954), Pinter, L. (1968), Sajo (1968), Nordsieck, H. (1972, 1974)	Betwen Isrets and Breze; Lakatnik; **№ 2; 5; 6**
53	*Macedonica marginata* (Rossmässler 1835)	Urbanski and Wiktor (1968), Oshanova (1968), Pinter, L. (1968), Sajo (1968), Urbanski (1977)	Lakatnik; Veslets; Vratsata; **№ 2; 4**
54	*Macedonica pinteri* Sajo 1968	Pinter, L. (1968), Sajo (1968), Nordsieck, H. (1972), Damjanov and Likharev (1975), Urbanski (1977)	Vratsa; Vratsata area; **№ 1; 2; 3**
55	*Mediterranea depressa* (Sterki 1880)	Riedel (1969), Damjanov and Likharev (1975)	near Vratsa, cave Propasta
56	*Mediterranea inopinata* (Ulicný 1887)	present work	**№ 5; 6**
57	*Merdigera obscura* (O. F. Müller 1774)	Oshanova (1968), Pinter, L. (1968)	Veslets; **№ 4; 6**
58	*Milax parvulus* Wiktor 1968	Urbanski and Wiktor (1968), Wiktor (1968, 1983)	Iskrets, in the vicinity of Purshevitsa; Milanovo; between Purshevitsa hut and Milanovo; Purshevitsa hut
59	*Monacha cartusiana* (O. F. Müller 1774)	Oshanova (1968)	Veslets; **№ 3 (?); 4 (?)**
60	*Monachoides incarnatus* (O. F. Müller 1774)	Oshanova (1968)	Veslets; **№ 4**

61	*Morlina glabra striaria* (Westerlund 1881)	Oshanova (1968), Pinter, L. (1968), Pinter and Pinter (1970)	Lakatnik; Veslets; **№ 2; 5; 6**
62	*Oligolimax annularis* (S. Studer 1820)	present work	**№ 2; 6**
63	*Oxyloma elegans* (Risso 1826)	Oshanova (1968), Pinter (1968), Damjanov and Likharev (1975)	Veslets; Vratsa
64	*Platyla similis* (Reinhardt 1880)	Urbanski (1960 c)	Lakatnik; **№ 2; 4; 5; 6**
65	*Pomatias elegans* (O. F. Müller 1774)	Wagner (1927), Urbanski (1960c), Pinter, L. (1968)	Lakatnik; Cherepishki Monastery
66	*Pomatias rivularis* (Eichwald 1829)	Oshanova (1968), Pinter (1968),Urbanski and Wiktor (1968), Urbanski (1960 c, 1977)	Lakatnik; Vratsata; Veslets; **№ 2; 5; 6**
67	*Pseudotrichia rubiginosa* (Rossmässler 1838)	Jaeckel (1954)	Lakatnik
68	*Punctum pygmaeum* (Draparnaud 1801)	present work	**№ 5**
69	*Pupilla sterrii* (Voith 1840)	present work	**№ 2**
70	*Pyramidula cephalonica* (Westerlund 1898)	Pinter (1968)	Vratsata; **№ 4**
71	*Pyramidula pusilla* (Vallot 1801)	Pinter (1968)	Vratsata; **№ 2; 6**
72	*Sphyradium doliolum* (Bruguière 1792)	Urbanski and Wiktor (1968), Pinter (1968), Pinter and Pinter (1970), Urbanski (1977)	Vratsata; **№ 2; 4; 5; 6**
73	*Tandonia budapestensis* (Hazay 1880)	present work	**№4**
74	*Tandonia kusceri* (H. Wagner 1931)	Wagner (1934b), Oshanova (1964, 1970), Wiktor (1983)	Cherepishki Monastery; Iskrets; Lakatnik; Moravitsa; Vratsa; Vratsa, Veterinary Institute, Leva river valley; **№ 4**
75	*Tandonia serbica* (H. Wagner 1931)	Urbanski and Wiktor (1968), Oshanova (1970), Damjanov and Likharev (1975), Wiktor (1983)	Lakatnik; Vratsa **№ 5**
76	*Truncatellina claustralis* (Gredler 1856)	Pinter (1968)	Veslets, **№ 5**
77	*Truncatellina cylindrica* (A. Férussac 1807)	present work	**№ 2; 5; 6**
78	*Vallonia costata* (O. F. Müller 1774)	present work	**№ 2; 5; 6**
79	*Vallonia pulchella* (O. F. Müller 1774)	Pinter and Pinter (1970)	Vratsata, **№ 2; 6**
80	*Vertigo alpestris* Alder 1838	Urbanski (1969), Damjanov and Likharev (1975)	Ledenika
81	*Vertigo pusilla* O. F. Müller 1774	Urbanski (1969), present work	**№ 2, 6**
82	*Vertigo pygmaea* (Draparnaud 1801)	Urbanski (1960 c), Oshanova (1968), Pinter (1968)	Lakatnik; Veslets
83	*Vestia ranojevici* (Pavlovic 1912)	Damjanov and Likharev (1975)	Ledenika; **№ 4**
84	*Vitrea contracta* (Westerlund 1871)	Pinter (1968, 1972)	Lakatnik; **№ 2; 6**

85	*Vitrea diaphana* (S. Studer 1820)	Pinter (1968, 1972); Pinter and Pinter (1970)	Lakatnik; Ledenika; **№ 2; 4; 5; 6**
86	*Vitrea neglecta* Damjanov & L. Pinter 1969	Pinter (1972), Damjanov and Likharev (1975)	Ledenika; Vratasata
87	*Vitrina pellucida* (O. F. Müller 1774)	Pinter and Pinter (1970)	Vratsata; **№ 2**
88	*Xerolenta obvia* (Menke 1828)	Oshanova (1968), Pinter and Pinter (1970)	Lakatnik; Veslets
89	*Zebrina detrita* (O. F. Müller 1774)	Wagner (1927), Jaeckel (1954), Pinter (1968), Pinter and Pinter (1970)	Cherepishky Monastery; Lakatnik; Vratsata; **№ 2; 5; 6**
90	*Zonitoides nitidus* (O. F. Müller 1774)	Oshanova (1968), Pinter, L. (1968)	Lakatnik; Veslets

Table 3. Conservation status and endemic species from the region of the Vrachanska Mts..

Abbreviations: BSG – Bulgarian State Gazette; LBD-41 – Law for the Biodiversity, art. 41, § 1, annex 4; IUCN – The IUCN Red List of Threatened Species, DD – data deficient, LC – least concern, NT – near threatened; BGE-Vr, Ir – Bulgarian endemic species, known from the regions of Vratsa Mountains and/or Iskar river gorge only; BGE – Bulgarian endemic species, BLE – Balkan endemic species.

	species	family	conservation status	endemics
1	*A. armata*	Argnidae	IUCN: LC	--
2	*A. langaleta*	Argnidae	IUCN: NT	BGE-Vr, Ir
3	*A. macrodonta*	Argnidae	IUCN: LC	BLE
4	*A. parreyssii*	Argnidae	IUCN: LC	BLE
5	*A. minor*	Oxychilidae	- -	--
6	*A. pura*	Oxychilidae	- -	--
7	*A. biplicata euptychia*	Clausiliidae	- -	BLE
8	*A. vratzatica*	Clausiliidae	- -	BGE-Vr, Ir
9	*A.* cf. *fasciatus*	Arionidae	- -	--
10	*A.* cf. *lusitanicus*	Arionidae	- -	--
11	*A.* cf. *silvaticus*	Arionidae	- -	--
12	*A.* cf. *subfuscus*	Arionidae	- -	--
13	*A. bulgarica*	Strobilopsidae	- -	BGE-Vr, Ir
14	*B. hiltrudae*	Clausiliidae	- -	BGE-Vr, Ir
15	*B. varnensis*	Clausiliidae	- -	BLE
16	*C. rhabdotoides*	Hygromiidae	IUCN: LC	BLE
17	*C. minimum*	Carychiidae	- -	--
18	*C. tridentatum*	Carychiidae	- -	--
19	*C. stussineri*	Oxychilidae	- -	--
20	*C. balcanica*	Helicidae	- -	BLE
21	*C. trizona*	Helicidae	IUCN: LC	BLE
22	*C. acicula*	Ferussaciidae	IUCN: DD	--
23	*C. vindobonensis*	Helicidae	IUCN: LC	--
24	*C. pelia*	Helicidae	IUCN: LC	BGE
25	*C. arcadica bulgarica*	Chondrinidae	- -	BLE
26	*C. tridens*	Enidae	- -	--
27	*C. lubricella*	Cochlicopidae	- -	--
28	*C. laminata*	Clausiliidae	- -	--
29	*D. brevipes*	Oxychilidae	- -	--
30	*D. rufa*	Oxychilidae	- -	--
31	*D.* cf. *laeve*	Agriolimacidae	- -	--
32	*D.* cf. *reticulatum*	Agriolimacidae	- -	--
33	*D. sturanyi*	Agriolimacidae	- -	--
34	*D.* cf. *turcicum*	Agriolimacidae	- -	--
35	*D. zilchi*	Agriolimacidae	- -	BGE
36	*D. bureschi*	Agriolimacidae	- -	--
37	*E. fulvus*	Euconulidae	- -	--
38	*E. strigella*	Hygromiidae	IUCN: LC	--
39	*F. fruticum*	Bradybaenidae	IUCN: LC	--
40	*G. frumentum hungarica*	Chondrinidae	IUCN: LC	BLE
41	*H. albescens*	Helicidae	IUCN: LC	--
42	*H. lucorum*	Helicidae	BSG, LBD-41	--
43	*H. pomatia*	Helicidae	IUCN: LC, BSG, LBD-41	--
44	*L. plicata*	Clausiliidae	- -	--

45	*L. nyctelia*	Limacidae	- -	--
46	*L. flavus*	Limacidae	- -	--
47	*L.* cf. *cinereoniger*	Limacidae	- -	--
48	*L. maximus*	Limacidae	- -	--
49	*L. girva*	Helicodontidae	IUCN: LC	--
50	*L. pirinensis*	Helicodontidae	IUCN: LC	BLE
51	*M. frauenfeldi regia*	Clausiliidae	- -	BGE-Vr, Ir
52	*M. frauenfeldi sigma*	Clausiliidae	- -	BGE-Vr, Ir
53	*M. marginata*	Clausiliidae	- -	--
54	*M. pinteri*	Clausiliidae	- -	BGE-Vr, Ir
55	*M. depressa*	Oxychilidae	- -	--
56	*M. inopinata*	Oxychilidae	- -	--
57	*M. obscura*	Enidae	IUCN: LC	--
58	*M. parvulus*	Milacidae	- -	BGE
59	*Monacha sp. (carthusiana?)*	Hygromiidae	IUCN: LC	--
60	*M. incarnatus*	Hygromiidae	IUCN: LC	--
61	*M. glabra striaria*	Oxychilidae	- -	--
62	*O. annularis*	Vitrinidae	- -	--
63	*O. elegans*	Succineidae	- -	--
64	*P. similis*	Aciculidae	IUCN: LC	--
65	*P. elegans*	Pomatiidae	- -	--
66	*P. rivularis*	Pomatiidae	- -	--
67	*P. rubiginosa*	Hygromiidae	IUCN: LC	--
68	*P. pygmaeum*	Punctidae	- -	--
69	*P. sterrii*	Pupillidae	- -	--
70	*P. cephalonica*	Pyramidulidae	- -	BLE
71	*P. pusilla*	Pyramidulidae	- -	--
72	*S. doliolum*	Orculidae	- -	--
73	*T. budapestensis*	Milacidae	- -	--
74	*T. kusceri*	Milacidae	- -	--
75	*T. serbica*	Milacidae	- -	BLE
76	*T. claustralis*	Vertiginidae	- -	--
77	*T. cylindrica*	Vertiginidae	- -	--
78	*V. costata*	Valloniidae	- -	--
79	*V. pulchella*	Valloniidae	- -	--
80	*V. alpestris*	Vertiginidae	- -	--
81	*V. pusilla*	Vertiginidae	- -	--
82	*V. pygmaea*	Vertiginidae	- -	--
83	*V. ranojevici*	Clausiliidae	- -	BLE
84	*V. contracta*	Pristilomatidae	- -	--
85	*V. diaphana*	Pristilomatidae	- -	--
86	*V. neglecta*	Pristilomatidae	- -	BLE
87	*V. pellucida*	Vitrinidae	- -	--
88	*X. obvia*	Hygromiidae	- -	--
89	*Z. detrita*	Enidae	- -	--
90	*Z. nitidus*	Gastrodontidae	- -	--

Currently in the region of Vrachanska Mts. 24 endemic species are known, 7 of them with only local distribution in the region of the mountains and Iskar river gorge, 3 Bulgarian endemics and 14 Balkan Peninsula endemic species (Table 3).

The present data are showing the high conservation importance of the region of Vrachanska Mts., but also unevenly and very scattered collecting efforts during the years. For general conclusions many more localities within the mountains area have to be investigated systematically.

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Принос към изучаването на сухоземните охлюви (Mollusca: Gastropoda) на Врачанска планина

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(Резюме)

В работа е дадена обобщена и нова информация за сухоземните охлюви на Врачанския Балкан. Общо 90 вида сухоземни охлюви са известни до момента от района на планината, 78 са публикувани от различни автори в миналото, като 56 от тях са потвърдени в настоящата публикация, докато 22 не са намерени. При проведените теренни проучвания са намерени и 12 вида, които се съобщават за първи път за района.

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Crustaceans from the groundwaters of Vratchanska Planina Mountains

IVAN PANDOURSKI, APOSTOL APOSTOLOV

Abstract. Thirty one Crustacean species from 21 localities are reported from groundwaters of Vratchanska Planina Mountain. The list of species is completed on the basis of available bibliographic sources and original data of authors. Faunal samples are collected at the natural access to underground ecosystem, caves and springs. Eight species are stygobionts: three cyclopoids, one harpacticoid, three isopods and one amphipod, or 6.6 % of all the Bulgarian stygobiont Crustacean fauna. *Elaphoidella balkanica* Apostolov and *Protelsonia lakatnicensis* (Buresch & Gueorguiev) are local endemic species of the Vratchanska planina Mountains.

Key words: Crustaceans, karst, caves, groundwaters, Vratchanska Planina Mountains, Bulgaria.

Introduction

Crustaceans are frequently found in Bulgarian groundwaters and they are one of the most numerous animal groups in the karstic water ecosystem of Vratchanska Planina Mts.. According to some contemporary conception (Valchev et al., 2013), Lakatnik part belongs to Mogilska Formation of the Vratchanska Planina Mts., therefore here we have included the species composition of crustaceans in caves and springs of this area. The present article summarizes all the information concerning the species composition and distribution of the Crustaceans in groundwaters of Vratchanska Planina Mts., including all published data. Fage (1926) described the first stygobiontic crustacean species (*Niphargus bureschi*) in the region of Lakatnik. In the middle of the last century Štěrba (1956) published short note with redescription of stygobiontic cyclopid *Speocyclops infernus* inhabiting the cave water of "Temnata dupka" near Lakatnik. Later, Buresch & Gueorguiev (1962) decribed the hypogeous endemic isopod *Protelsonia lakatnicensis* from the same cave. During the period 1990 – 2000 more intensive, but of incidental nature investigations were carried out: Pandourski (1991, 1992, 1998, 2000) and Apostolov (1992, 2012).

Material and Methods

The list of Crustacean species in groundwaters of Vratchanska Planina Mts. is completed on the basis of available bibliographic data, mentioned above in Introduction, and

original data of authors. Faunal samples are collected at the natural access to underground ecosystem, caves and springs, by direct filtering of water at the outlet using phreatic net of Cvetkov (1968), plankton nets of mesh size between 38 and 100 μm, and hand-held plankton net. Faunal material is also collected with Bou-Rouch pump or by the methods of artificial substrates or of Karaman-Chappuis (Mathieu et al. 1991). The samples were collected from the different hydrodynamic zones of karst: the infiltration and the saturated zones and during low-water and high-water periods.

The material originates from 21 localities (Table 1). For some of caves and springs their geographic position is mentioned only by topographic names because the accurate coordinates are unknown.

Table 1. Collection localities of crustacean species in Vratchanska Planina Mts..

No	Localities	**Coordinates (**WGS84), **topographic name**
Caves		
1	**"Barkite 14",** Gorno Ozirovo Village	N43° 13' 10.2" E23° 27' 23.1"
2	**"Ledenika",** Vratza	N 43° 12' 35.64" E 23° 29' 34.80"
3	**"Belyar",** Gorno Ozirovo Village	N 43° 13' 26.70" E 23° 27' 16.50"
4	**"Stresherska Jama",** Gorno Ozirovo Village	N 43° 12' 45.59" E 23° 28' 15.82",
5	**"25 Godini Akademik" ("Barkite 08"),** Gorno Ozirovo Village	N 43° 13' 18.72" E 23° 27' 24.69"
6	**"Temnata Dupka",** Lakatnik railway station	N 43° 05' 23.49" E 23° 23' 13.03"
7	**"Razhishkata Peshtera"**, Lakatnik railway station	N 43° 05' 25.95" E 23° 23' 00.03"
8	**"Ezeroto"**, Tcherepish railway station	N 43° 05' 56.37" E 23° 36' 35.36"
9	**"Kalna Matnitza",** Glavatzi Village	N 43° 15' 54.10" E 23° 20' 47.85",
10	**"Dupkata"**	Beli izvor village
11	**Cave near "St. Ivan Pusti" Monastery**, near "St. Ivan Pusti" Monastery	N 43° 14' 35.36" E 23° 27' 43.88"
Karstic Springs		
12	**"Jitoljub",** Lakatnik railway station	N 43° 05' 18.66" E 23° 22' 59.63"
13	**Karstic spring**	Bistretz village
14	**"Beli izvor"**	Vratza
15	**"Kalna Matnitza",** Glavatzi village	N 43° 15' 55.04" E 23° 20' 52.71"
16	**"Opletnenski izvori",** Opletnya Village	N 43° 07' 25.81" E 23° 27' 09.69"
17	**"Ezeroto"**, Tcherepish railway station	N 43° 05' 55.47" E 23° 36' 34.26"
18	**"Petrenski izvor"**	N 43° 05' 38.56" E 23° 21' 56.55"
Artificial galleries and geologic borehole		
19	**Mine "Zgorigrad"**, Zgorigrad Village	N 43° 09' 35.19" E 23° 29' 18.17"
20	**Artificial gallery,** Gorna Bela Retchka Village	N 43° 09' 50.78" E 23° 21' 47.45"
21	**Geologic borehole**	Beli Izvor Village

Results and Discussion

Species composition with number of localities

Subphylum Crustacea

Class Ostracoda

- Ostracoda gen. sp.: 1, 4, 5, 6, 12,14, 16, 18;

Class Maxillopoda

Subclass Copepoda

Order Cyclopoida

- Cyclopoida – copepdites: 4
- *Paracyclops fimbriatus* (Fischer 1853): 1, 2, 3, 10, 12, 13, 19;
- *Paracyclops poppei* (Rehberg 1880): 21;
- *Eucyclops serrulatus* (Fischer 1851): 6, 12, 19, 21;
- *Cyclops strenuus* Fischer 1851: 14;
- *Megacyclops viridis* (Jurine 1820): 6, 9, 12, 14, 15, 19;
- *Macrocyclops albidus* (Jurine 1820): 10;
- *Acanthocyclops vernalis vernalis* (Fischer 1853): 10, 15, 21;
- *Acanthocyclops* sp. ("*kiefer*i" gr.): 16;
- *Diacyclops languidoides* (Lilljeborg 1901) (s. lat.): 1, 6, 21;
- *Diacyclops languidoides languidoides* (Lilljeborg 1901): 10, 15, 12, 14;
- *Diacyclops clandestinus* (Kiefer 1926): 6;
- *Diacyclops bisetosus* (Rehberg 1880): 1, 21;
- *Metacyclops minutus* (Claus 1863): 21;
- *Speocyclops infernus* (Kiefer 1930): 2, 3, 5, 6, 7, 20;
- *Speocyclops lindbergi* Damian 1957: 8;

Order Harpacticoida

- Harpacticoida gen. sp.: 7, 17;
- *Bryocamptus* (*Bryocamptus*) *minutus* (Claus 1863): 4;
- *Bryocamptus* (*Rheocamptus*) *pygmaeus* Sars 1863: 4, 12, 18;
- *Bryocamptus* (*Rheocamptus*) *zschokkei tatrensis* (Minkiewicz 1916): 1;
- *Bryocamptus* (*Limocamptus*) *dacicus* (Chappuis 1923): 1;
- *Canthocamptus* (*Canthocamptus*) *staphylinus* (Jurine 1820): 1;
- *Pesceus schmeili* (Mrazek 1893): 3, 5;
- *Moraria* (*Moraria*) *poppei* (Mrazek 1893): 1;
- *Attheyella* (*Attheyella*) *wierzejskii wierzejskii* (Mrazek 1893): 1;
- *Attheyella* (*Attheyella*) *crassa* (Sars 1863): 6, 18;
- *Elaphoidella balkanica* Apostolov 1992: 5;

Class Branchiopoda

Order Dipolstraca

- *Streblocerus serricaudatus* (Fischer 1849): 1;
- *Daphnia* (*Daphnia*) *parvula* Fordyce 1901: 14;

Class Malacostraca

Order Isopoda

- *Asellus aquaticus* (Linnaeus 1758): 14;
- *Bureschia bulgarica* Verhoeff 1926: 3; 6;

- *Sphaeromides bureschi* (Fage 1926): 9, 11;
- *Protelsonia lakatnicensis* (Buresch & Gueorguiev 1962): 6;

Order Amphipoda

- *Niphargus* sp.: 8, 9, 13, 14, 18, 19, 20;
- *Niphargus bureschi* Fage 1926: 3, 5, 6.

Thirty one species of Crustaceans are known from groundwaters of Vratchanska Planina Mts. but we consider that the faunal list can be enriched by further research. Eight species are stygobionts: three cyclopoids, one harpacticoid, three isopods and one amphipod (6.6 % of the Bulgarian stygobiont Crustacean fauna).

Widely distributed in the karst of Western Stara Planina is the Balkan endemic species *Speocyclops lindbergi*, originally described from Romania. *Elaphoidella balkanica* is a local endemic species, known only from a cave in high part of the Vratchanska Planina Mts.. *Protelsonia lakatnicensis* is also known only from a single locality – the cave "Temnata Dupka" near Lakatnik. This isopod could be considered as an endemic relict species which probably originated during the Upper Cretaceous (Pandourski & Breskovski, 1995).

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Ракообразни (Crustacea) от подземните води на Врачанска планина

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(Резюме)

Съобщават се 31 вида ракообразни от 21 находища в подземните води на Врачанска планина. Списъкът на видовете е съставен въз основа на наличните библиографски източници и оригинални данни на авторите. Фаунистичните проби са събрани в зоните на естествен достъп до подземната екосистема – пещерите и изворите. Осем вида са стигобионти: три циклопиди, една харпактикоида, три изоподи и една амфипода, или 6,6 % от известната досега българска стигобионтна фауна. *Elaphoidella balkanica* Apostolov и *Protelsonia lakatnicensis* (Buresch & Gueorguiev) са локални ендемити за Врачанска планина.

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The scorpion of Vrachanska Planina

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Abstract. The only species of Scorpiones in Vrachanska Planina Mountains is *Euscorpius deltshevi* (Euscorpiidae), which was undescribed until the last year. This species is found in the study area from the foot of the mountains up to 1000 m altitude. It is a Balkan endemic species, distributed in the northeastern part of the Balkan Peninsula, which represents a Carpathian faunal element according to its centre of origin with a centre of dispersion in Western Stara Planina Range. According to DNA marker data, *Euscorpius deltshevi* has been isolated from its sister species, *Euscorpius carpathicus* from Southwestern Romania, for 3.1 Myr.

Key words: Scorpiones, Euscorpiidae, *Euscorpius*, Western Stara Planina, Bulgaria, distribution, origin.

Introduction

As large and venomous animals, scorpions (Arachnida: Scorpiones) have attracted human attention since prehistorical times, and scholars' attention since the advent of zoology. Often collected by expert zoologists as well as amateurs, they are richly represented in museum collections. Nevertheless, many new species have been described in the recent decades, including many from Europe.

A good example of this explosive species description in the 21st century is *Euscorpius* Thorell, 1876 (family Euscorpiidae), the most diverse European scorpion genus. For over 100 years, only 4 species were identified in Europe, however with numerous subspecies each (Fet & Soleglad 2002). The detailed studies of the last 15 years, both morphological and DNA-based molecular, demonstrated that *Euscorpius* species, and especially those previously addressed as *Euscorpius carpathicus* (Linnaeus, 1767) and *E. germanus* (C. L. Koch, 1837), represent complexes of diverse, cryptic species (Fet *et al.* 2004). Scorpions, a nocturnal group of secretively living predators, have few visible morphological traits that would be useful for humans to easily distinguish related taxa. However, these cryptic forms of *Euscorpius*, isolated for a very long time from each other, fit well definitions of distinct species according to any species concept.

Their intensive speciation took place across the Mediterranean region in the Apennine, Balkan, and Anatolian Peninsulas. As a result of current studies, the number of species in the genus *Euscorpius* increased tenfold and reached now 42 species. In Greece, for instance, only 6 species have been known (4 described in the 19th century, and 2 in

mid-20th); and only within the last 3 years, many more species have been added, up to 21 at this moment; new species were described, old taxa restored from synonymy, or elevated from subspecies rank; many forms still remain undescribed (Kovařík *et al.* 2014, Tropea & Fet 2015).

In Bulgaria, as we know now, the genus *Euscorpius* also is represented by several cryptic species. The first data on Bulgarian scorpions were published by Jurinić (1904) under the Linnean name *Euscorpius carpathicus*. No new information about scorpions of Bulgaria was published for 90 years. Studies by the first author (V.F.) and his colleagues in the 21st century brought the number of scorpion species in Bulgaria currently to 7: these include *Mesobuthus gibbosus* (Brullé, 1832) (family Buthidae) and 6 species of *Euscorpius*, 2 of which have been not yet named (Fet *et al.* 2014, Tropea *et al.* 2015). It became clear that the species that inhabits Vrachanska Planina as well as the entire Stara Planina was undescribed, and it was named only in 2014 in honor of the foremost Bulgarian arachnologist, our good friend Dr. Christo Deltshev.

Abbreviations. The abbreviations used in the list of localities are:

coll. – collection of
juv. - juvenile specimen(s)
leg. – collected by
Ma – million years ago
Myr – million years
NMNH – National Museum of Natural History, Sofia
subad. – subadult specimen(s)

CHACTOIDEA
E u s c o r p i i d a e

***Euscorpius* (*Euscorpius*) *deltshevi* Fet, Graham, Webber & Blagoev, 2014** (Fig. 1)

Euscorpio [sic!] *carpaticus* [sic!] Buresch, Tranteev & Alexandrov 1949: 9 (nec Linnaeus, 1767).

Euscorpius carpathicus Guéorguiev & Beron 1962: 308-309, 367, 368 (nec Linnaeus, 1767).

Euscorpius (*Euscorpius*) sp. ("*carpathicus* complex"), "northern" group of populations: Fet & Soleglad 2007: Fig. 13, 15.

Euscorpius (*Euscorpius*) *deltshevi* Fet, Graham, Webber & Blagoev 2014: 84, 87, 89, 90, Fig. 1, 2A, 2B.

Localities in Vrachanska Planina. Cherniya Izvor Cave near Matnishki Monastery, FN99, 3.4.1999, 1 ♀, leg. B. Petrov, coll. NMNH (Fet *et al.* 2014). Lyutadzhik, FN98, 450 m a.s.l., 1.4.2000, 1 ♀, leg. B. Petrov and V. Beshkov, coll. NMNH (Fet *et al.* 2014). Vartop Cave near Gorna Bela Rechka, FN98, 1 ♀, 7.5.1909 [incorrect year!], coll. NMNH (Fet *et al.* 2014). Between Milanovo and Gorna Bela Rechka, FN97/FN98, May 1911, 4 ♂♂, 2 ♀♀, 1 ♂ juv., leg. P. Drenski, coll. NMNH (Fet *et al.* 2014). Vratsa, GN08, 1.7.1924, 1 ♀ subad., leg. I. Buresch, coll. NMNH; 290 m a.s.l., 8.5.1999, 4 ♀♀, leg. S. Boev, coll. Victor Fet, Huntington; environs of Vratsa, 2.6.1926, 1 ♂ subad., 1 ♀, leg. H. Matrov, coll. NMNH (all after Fet *et al.* 2014). Southern Vrachanska Planina (above Vratsa; see details below), GN08, 880 m, 1.1.2005, 1 ♀, leg. T. Ljubomirov, coll. NMNH (Fet *et al.* 2014). Near Ledenika Cave, GN08, 5.6.1933, 2 ♂♂, leg. D. Papazov and N. Atanassov, coll. NMNH (Fet *et al.* 2014).

Parshevitsa Chalet, GN08, 1000 m a.s.l., 2.5.1994, 1 ♀, leg. P. Stoev, coll. NMNH (Fet *et al.* 2014). Malata Yama Pothole near Chelopek, GN17, 1.7.1929, 1 ♂, leg. N. Radev, coll. NMNH (Fet *et al.* 2014). Lakatnik Railway Station, FN97, 23.3.1930, 1 ♀ paratype, leg. P. Drenski; 6.5.1934, 2 ♂♂ subad. paratypes, leg. J. Zonkov; 20.8.1934, 1 ♀ paratype, leg. G. Stoyanov; 10.7.1948, 1 ♂ subad. paratype, 2 ♀♀ subad. paratypes, 1 ♀ juv. paratype, leg. A. Ivanov and P. Tranteev, all coll. NMNH; 1970, 1 ♂ paratype, 2 ♀♀ paratypes, coll. National Museum, Natural History Museum, Prague, 1 ♂ paratype, coll. František Kovařík, Prague; 15.5.1997, 2 ♀♀ paratypes, leg. B. Petrov, coll. NMNH; N 43°05′10″, E 23°23′01″, 4.5.2005, 6 ♀♀ paratypes, leg. V. Fet and A. Popov, coll. Victor Fet, Huntington (used for DNA barcoding), 1 ♀ paratype, coll. Naturhistorisches Museum Wien (all according to Fet *et al.* 2014). Lakatnik Railway Station, Temnata Dupka Cave, FN97, entrance hall of the cave, under stones, 8.7.1948, 5 specimens (Buresch *et al.* 1949); near Temnata Dupka Cave, 24.7.1988, 1 ♂ paratype, 4 ♀♀ paratypes, leg. P. Mitov, coll. Victor Fet, Huntington (Fet *et al.* 2014). Lakatnik Railway Station, Razhishkata Peshtera Cave (= Gornata Peshtera Cave; = Suhata Peshtera Cave) FN97, entrance of the cave, under stones, 16.2.1958, 1 specimen, V. Guéorguiev observed (Guéorguiev & Beron 1962); near Razhishkata Peshtera Cave, 7.8.1948, 2 ♀♀ paratypes, 1 ♀ juv. paratype, leg. G. Rupev, coll. NMNH (Fet *et al.* 2014). Opletnya, FN97, N 43°06′, E 23°26′, 21.5.1994, 1 ♂ paratype, 2 ♀♀ paratypes, leg. P. Stoev, coll. NMNH (Fet *et al.* 2014). Cherepish Monastery, GN17, 1.5.1959, 1 ♂, leg. A. Popov, coll. NMNH (Fet *et al.* 2014).

The locality mentioned above and published by Fet *et al.* (2014) as Southern Vrachanska Planina is in fact Hizhata v Komplex Vestitelyat (the Chalet in the Herald Complex) south of Vratsa, with coordinates N 43°11′49″, E 23°33′03″, and an unusual date of collection – January 1st (!), is correct (Dr. Toshko Ljubomirov, pers. comm.).

Localities in adjacent areas. Except 32 paratypes from Vrachanska Planina, the rest of the type material, consisting of 7 males and 19 females, originates from the closely located parts of Iskar Gorge (Tserovo, including holotype; Svoge; Tompsan) and the neighbouring to the gorge areas of Ponor Mts. (Zanoge and between Tserovo and Iskrets). Among the other material for the original description, not designated as paratype material, specimens from adjacent areas are included from the remaining further part of Iskar Gorge (Rebrovo and Kurilo), from near areas on the east of Iskar River (Izdremets Peak, Sedemte Prestola Monastery, Lipnitsa) and from the lowland north of Vratsa (Chiren).

Material from adjacent areas is mentioned also in the papers published before the species description. Jurinić (1904) reported scorpions from Svoge and Berkovitsa as *Euscorpius carpathicus* and noted that he has found a lot of specimens near Svoge on a sunny slope. This is the southern slope of Ponor Mts. Jurinić (1904) specified that the specimens from Svoge are the biggest ones (40-42 mm) among his material from Bulgaria. These measurements are obviously overrated because the total length according to the original description of *Euscorpius deltshevi* is 33-35 mm (Fet *et al.* 2014). Fet (2000) placed the material from Zanoge, Tserovo, and Rebrovo in subgroup A2 of *Euscorpius carpathicus* s.l. (= "*Euscorpius carpathicus*" complex; an informal grouping which is now outdated). A large series from Rebrovo was donated to V.F. by Dr. Michail Kwartirnikow (Sofia) in the early 1980s, which triggered the first author's interest in Bulgarian scorpion fauna.

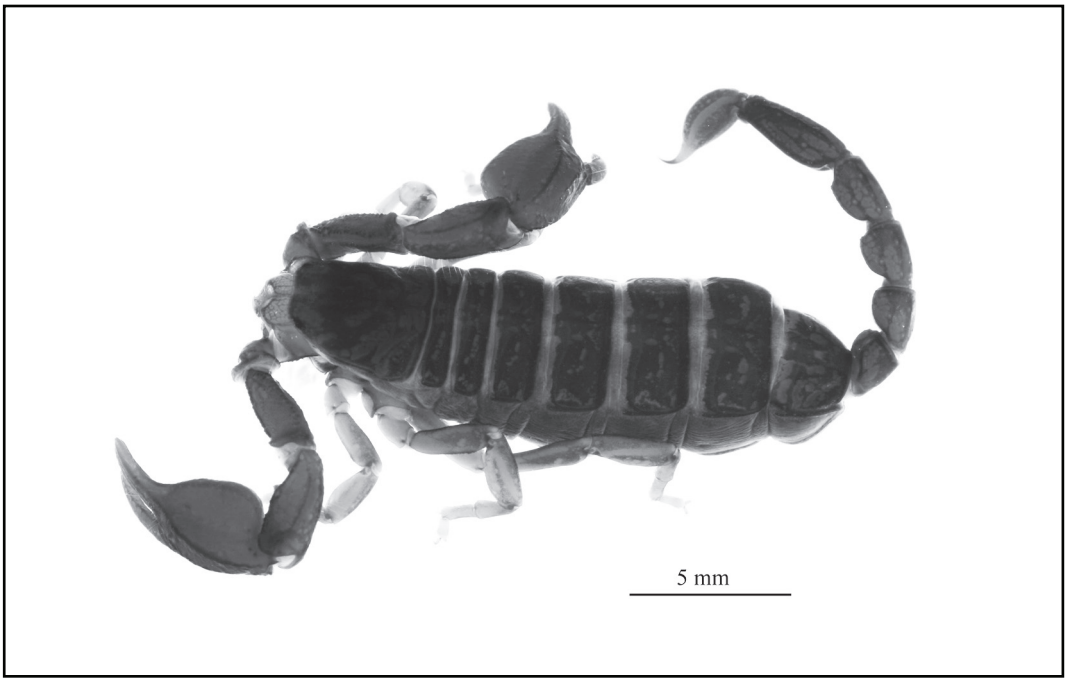

Fig. 1. *Euscorpius deltshevi*, female. Photo: Gergin Blagoev.

Vertical distribution

The only scorpion species in Vrachanska Planina has been found from the lowest parts at the foot of this mountain range (Vratsa, Chelopek, Cherepish, Opletnya, Lakatnik) up to 1000 m altitude below Parshevitsa Chalet. The highest record of *Euscorpius deltshevi* is from Izdremets Peak in Golema Planina, 1400 m (Fet *et al.* 2014). These altitudes seem to be rather high for the latitude of Stara Planina Range as well since scorpions are thermophilic animals occurring in Bulgaria in lowlands, plains and foothills. For karstic regions like Vrachanska Planina and Golema Planina, however, these altitudes are not surprising. The highest occurrence of scorpions in Bulgaria refers also to the genus *Euscorpius* (*E. popovi*) and is registered on Tsarev Vrah Peak in Slavyanka Mts. at 2100 m (Tropea *et al.* 2015).

Range

Distribution of *Euscorpius deltshevi* covers Southeastern Serbia (Nišava Province), North Bulgaria, Stara Planina Range and some areas of South Bulgaria. The localities in North Bulgaria (Danubian Plain) are situated between Deventsi near Cherven Bryag in the west and Svalenik near Tsar Kaloyan and Ruse in the east. In Predbalkan (the northern foothills of Stara Planina), this species is found from Belogradchik and Oreshets near Dimovo in Western Predbalkan to Targovishte and Patleyna near Veliki Preslav in Eastern Predbalkan. In Stara Planina Range, it occurs from Martinovo and Gorna Luka, both near Chiprovtsi, in Western Stara Planina to Kotel and Katunishte in Eastern Stara Planina. The known localities south of Stara Planina are only two: Golo Bardo Mts. in Southwestern Bulgaria and near Yambol in Southeastern Bulgaria.

Origin

Euscorpius deltshevi is an endemic Balkan species. According to its chorotype, it is a Northeastern Balkan species. Stara Planina is the nodal part of its range irrespectively of the species occurrence on the north and south of it. Thus, Stara Planina, and especially Western Stara Planina, is the centre of dispersal of this species. Considering its centre of origin, *E. deltshevi* is most likely a Carpathian faunal element. As related to the border between Eurosiberian and Mediterranean zoogeographical subregions, which lies near the southern border of Bulgaria, the scorpion species of Vrachanska Planina has a northern origin.

Relationships

Phylogenetic position of *Euscorpius deltshevi* in the subgenus *Euscorpius* s.str. is identified on the basis of DNA barcoding analysis by Fet *et al.* (2014). As a result of this analysis, *E. deltshevi* was found to be a sister species of *E. carpathicus*. *E. deltshevi* is the most closely related species to *E. carpathicus*; together they form what could be called *carpathicus*-group of species. Other morphological and molecular studies proved that the distribution of *E. carpathicus* is limited only to the southernmost part of the Southern Carpathians (Transylvanian Alps) in Romania (Fet & Soleglad 2002, Fet *et al.* 2014).

Species age

DNA analysis of certain populations in the range of *E. deltshevi* and their relationship with other species of the subgenus *Euscorpius* s.str. allows to estimate a degree of genetic relationship of the population in investigated area (Fet *et al.* 2014). The population of Vrachanska Planina (Lakatnik) is most closely related to the population of Tserovo, the most closely located among all studied populations for which molecular markers have been studied. Isolation between them has arisen 280 000 years ago. According to DNA divergence estimates, these two populations have been separated from the populations inhabiting regions further to the west (Southeastern Serbia, Beledie Han, Gorna Luka, Oreshets, Belogradchik) for 2.1 Ma. Isolation of the two populations in the Iskar Gorge from those occurring further to the east (Teteven, Sliven) has begun 2.4 Ma. In other words, the time of origin of *Euscorpius deltshevi* is estimated as early as 2.4 Ma, i.e. the Early Pleistocene. The two related species, *E. deltshevi* and *E. carpathicus*, are isolated during the last 3.1 Myr, i.e. from the Late Pliocene. The other distinct clade in subgenus *Euscorpius* includes *Euscorpius sicanus* (C. L. Koch, 1837) from Italy, Malta, Greece, Madeira and North Africa (most likely a complex of species); *Euscorpius hadzii* Di Caporiacco, 1950 from Croatia, Bosnia and Herzegovina, Serbia, Montenegro, Kosovo, Albania, Macedonia and Greece; and a newly described *Euscorpius solegladi* Fet, Graham, Webber & Blagoev, 2014 from Southwestern Bulgaria and Northern Greece. Isolation between *E. deltshevi* and the clade of the three abovementioned species is estimated as 5.6 Myr, i.e. from the Late Miocene.

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Скорпионът на Врачанската планина

ВИКТОР ФЕТ, АЛЕКСИ ПОПОВ

(Резюме)

Единственият вид скорпион във Врачанската планина е *Euscorpius deltshevi* (Scorpiones: Euscorpiidae). Оказа се, че е останал неописан до миналата година. В изследвания район е установен от подножието на планината до 1000 м н.в. Това е балкански ендемичен вид, разпространен в североизточната част на Балканския полуостров, който според центъра на произход е карпатски фаунистичен елемент с център на разселване в Западна Стара планина. *Euscorpius deltshevi* е изолиран от най-близкородствения си вид, *Euscorpius carpathicus* от Югозападна Румъния, от преди 3,1 милиона години.

Bechev, D. & Georgiev, D. (Eds.),
Faunistic diversity of Vrachanski Balkan Nature Park.
ZooNotes, Supplement 3, Plovdiv University Press,
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Spiders from the Vrachanska Planina Mountains (Arachnida: Araneae)

CHRISTO DELTSHEV, STOYAN LAZAROV

Abstract. A total of 110 species from 22 families have been found in the Vrachanska Planina Mts., 32 of them are newly identified for the mountain. This number represent about 10% from all species found in Bulgaria (1036 species). The percentage of the endemics is comparatively high (30%) and emphasize the local character of this fauna.

Key words: Spiders, faunistic, Vrachanska Mts., Bulgaria.

Introduction

The first reports about the spider fauna of the Vrachanska Mts. came from Pavesi (1876). Significant contribution, however, maked Drensky (1910, 1913, 1915, 1931). This information was summarized later in a huge paper "Katalog der echten Spinnen (Araneae) der Balkanhalbinsel" (Drensky, 1936), where were reported 55 species, found in the mountain. Additional data can be found again in the later papers of Drensky (1938, 1939, 1940, 1942, 1943), Deltshev (1970, 1972a,b, 1973a,b, 1975, 1980, 1982, 1992, 1988), Deltshev & Blagoev (1995) and Deltshev *et al.* (2003). The aim of this study is to present an analysis of the diversity of the spider fauna in the Vrachanska Mts. This review is a critical incorporation of the available literature data and records unpublished due to sporadic research in the last 70 years.

Material and Methods

The established data came mainly from the regions of the town of Vratsa and caves in the vicinity of the settlements: Vratsa, Lyutadzhik, Gorna Bela Rechka, Milanovo, Druzhevo. Lakatnik, Zverino, Eliseyna, Cherepish and Chelopek. The list of the localities (and related data) is given in Table 1, and their locations, mainly by GPS coordinations are presented on the Fig. 1 and Table 1. The spiders have been collected mainly by hand, under stones, by sweeping and sewing. The taxonomic arrangements of the species list follow WSC (2015). The material is deposited in the National museum of Natural History (Sofia).

Table 1. List of the localities whit sampling or reference data

No	Locality	Latitude	Longitude	Date	Leg & Publication
1	Vratsa Town - surroundings	43.1972	23.5518	16.08.1962	Drensly, (1936); P.T., S. L.
2	Vratsa Town, Vratsata place	43.1918	23.5340	02.05.1998	Drensly, (1936); S. L.
3	Zgorigrad, Vratsa district	43.1830	23.5236	16.08.1949	P. T.
4	Ledenika Cave, Vratsa Town	43.2045	23.4934		Drensly, (1936); Deltshev (1970); Deltshev (1982)
5	Reznyovete Cave, Vratsa Town	43.2001	23.4876		Drensky (1936); Deltshev (1970)
6	Zmeyova Dupka Cave, Vratsa Town	43.2447	23.4361		Deltshev (1970)
7	Zmeyova Dupka II Cave, Vratsa Town	43.2419	23.4445		Deltshev (1972b)
8	Garvanets Cave, Vratsa Town	43,1943	23,4960		Deltshev (1982)
9	Sipo Cave, Vratsa Town	43,2346	23,4442		Deltshev (1972b)
10	Toshova Dupka Cave, Beli Izvor Village	43,2649	23,3466		Deltshev (1972)
11	Mecha Dupka Cave, Lyutadzhik Village	43.1879	23.4157		Deltshev (1972a)
12	Sokolska Dupka Cave, Lyutadzhik Village	43.1902	23.4223		Deltshev (1972a); Deltshev (1973a)
13	Vratnik Cave, Lyutadzhik Village	43.1847	23.4199		Deltshev (1973b)
14	Belyara Cave, Vratsa Town	43,2240	23,4544		Deltshev (1972); 1973a)
15	Barkite Cave, Vratsa Town	43,2215	23,4583		Deltshev (1988)
16	Ludoto Ezero Cave, Vratsa Town	43.1664	23.5611	29.10.1973	P. B
17	Haydushka Dupka Cave, Bistrets Village	43.2236	23.5022		Deltshev (1980)
18	Artificial gallery, Gorna Bela Rechka Vill.	43.1825	23.3601		Deltshev et al (2003)
18	Varteshkata Cave, Zverino Village	43,1412	23,5560		Deltshev (1982)
19	Propast 8 Cave, Zverino Village	43.0836	23.5634		Deltshev (1970)
20	Studenata Dupka Cave, Cherepish Village	43.0995	23.6043		Drensky (1936); Deltshev (1972a)
21	Serapionovata Cave, Cherepish Village	43,1008	23,6139		Drensky (1936)
22	Cherepish Monastery, Cherepish Village	43.0937	23.6159		Drensky (1936)
23	Artificial gallery, Gorna Bela Rechka Vill.	43.1857	23.3578		Deltshev *et al.* (2003)
24	Druzhevo Vill. - surroundings	43.1369	23.3619	14.07.1949	P. T.
25	Milanovo Vill. - surroundings	43.1237	23.3954	06.07.1948	P. T.
26	Radyova Yama Cave, Milanovo Vill.	43.1316	23.4079		Deltshev (1988)
27	Lakatnik rocks - surroundings	43.0884	23.383	08.07.1948	P. D.
28	Yamata Cave, Chelopek Vill.	43.1357	23.5787		Deltshev (1970)
29	Eliseyna 9 surroundibgs	43.0808	23.4863	14.06.2005	M. T.
30	Temnata Dupka Cave, Lakatnik	43,0889	23,3848		Drensly, (1936)
31	Razhishkata Dupka Cave, Lakatnik	43,0900	23,3850		Drensly, (1936)
32	Svinskata Dupka Cave, Lakatnik	43,0883	23,3717		Deltshev *et al.* (2003)

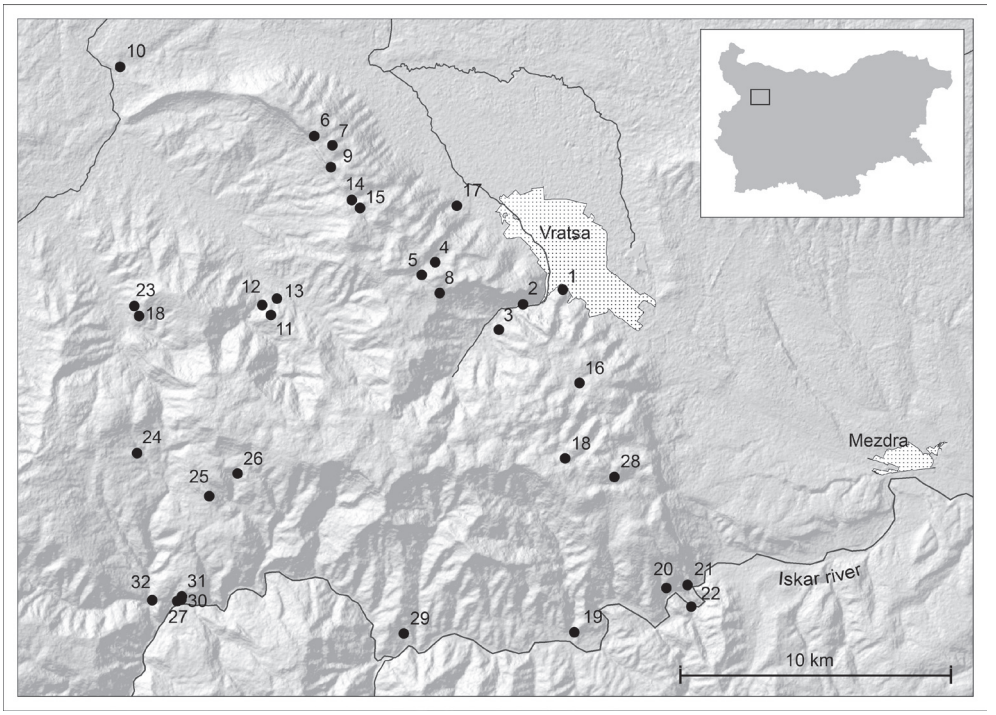

Fig. 1. Localities where the spiders were collected.

Results and Discussion

Species composition

The study comprises 110 species from 22 families:, Agelenidae – 8, Amaurobiidae – 1, Araneidae – 5, Atypidae – 1, Clubionidae - 1, Dysderidae – 2, Eresidae – 1, Eutichuride – 1, Gnaphosidae – 14, Hahniidae – 1, Linyphiidae – 26, Liocranidae – 1, Lycosidae – 19, Nesticidae – 1, Philodromidae – 3, Pholcidae – 3, Phrurolithidae – 2, Salticidae – 8, Tetragnathidae – 3, Theridiidae – 4, Thomisidae – 4, Zodariidae – 1 (Table 2). Thirty two species are new for the spider fauna of the Vrachanska Mts. (marked in the list with *).

The number of the species represents about 10% from all known Bulgarian species (n = 1036). The comparison with the number of spiders recorded from the other mountains of Bulgaria with similar size: Osogovo – 228 (Tsonev & Lazarov, 2001), Lyulin – 195 (Naumova *et al.*, 2008), Vitosha - 154 (Deltshev, 1967) show, that the spider fauna is not studied completely.

The most characteristic are the families: Linyphiidae (26 species, 22.6 %), Lycosidae (19, 12.2 %), Gnaphosidae (14, 9.6%), Agelenidae (8, 7.2%), Salticidae (8, 7.2%) and Araneidae (5, 4.5 %). The other families are represented by a small number of species (1 - 4) (Table 2). The most common species in caves are: *Lepthyphantes leprosus, Meta menardi*, *Metellina merianae*, *Nesticus cellulanus*, *Porrhomma convexum*, and *Lepthyphantes centromeroides*,.

Table 2. Species composition, distribution and conservation status of the spiders in Vrachanska Planina Mts..

Legend: *- new species for the study area; BK – Balkan Endemic; BG – Bulgarian endemic, r – rare species.

Taxa	Locality	Status
AGELENIDAE		
Agelena labyrinthica (Clerck, 1757)	1	
Allagelena gracilens (C. L. Koch, 1841)	1	
Inermocoelotes jurinitschi (Drensky, 1915)	4, 27	BG
Inermocoelotes karlinskii (Kulczyński, 1906)	22	BK
Tegenaria campestris C.L. Koch, 1834	1	
Tegenaria domestica (Clerck, 1757)	20, 21, 28, 29	
Tegenaria pagana (C. L. Koch, 1840)	1	r
Tegenaria silvestris L. Koch, 1872	4, 12, 13, 20	
AMAUROBIIDAE		
Amaurobius pallidus L. Koch, 1868	1, 2, 22	
ARANEIDAE		
Araneus diadematus Clerck, 1757	4	
Araneus triguttatus (Fabricius, 1775)	22	
*Araniella opistographa (Kulczyński, 1905)	25	
Argiope bruennichi (Scopoli, 1772)	1	
*Larinioides ixobolus (Thorell, 1873)	24	
ATYPIDAE		
* Atypus piceus (Sulzer, 1776)	24	r
CLUBIONIDAE		
*Clubiona pseudoneglecta Wunderlich, 1994	2	r
DYSDERIDAE		
Dysdera crocota C. L. Koch, 1838	1	
*Harpactea babori (Nosek, 1905)	1	
ERESIDAE		
*Eresus kollari Rossi, 1846	1	r
EUTICHURIDAE		
*Cheiracanthium punctorium (Villers, 1789)	4	r
GNAPHOSIDAE		
Callilepis nocturna (Linnaeus, 1758)	1	r
Drassodes lapidosus (Walckenaer, 1802)	1	
Drassyllus praeficus (L. Koch, 1866)	27	
Drassyllus pusillus (C. L. Koch, 1833)	27	
Gnaphosa bicolor (Nahn, 1833)	22	
Gnaphosa lucifuga (Walckenaer, 1802)	1	
Haplodrassus umbratilis (L. Koch, 1866)	1	r
Echemus angustifrons (Westring, 1861)	31	
Kishidaia conspicua (C. L. Koch, 1866)	2	r
*Scotophaeus scutulatus (L. Koch, 1866)	27	r
Trachyzelotes pedestris (C. L. Koch, 1837)	1	
Zelotes apricorum (L. Koch, 1876)	1	

Zelotes clivicola (L. Koch, 1870)	1	r
Zelotes hermani (Chyzer, 1897)	22	r
Zelotes oblongus (C. L. Koch, 1833)	1, 27	r
HAHNIDAE		
Antistea elegans (Blackwall, 1841)	1	r
LINYPHIIDAE		
*Acartauchenius scurrilis (O.P.-Cambridge, 1872)	1	r
Agyneta rurestris (C.L. Koch, 1836)	27	
Antrohyphantes sophianus (Drensky, 1931)	4, 7, 9,	BG
Centromerus bulgarianus (Drensky, 1931)	12, 14, 31	BG
Centromerus lakatnikensis (Drensky, 1931)	26, 31	BK
Centromerus pabulator (O.P.-Cambridge, 1875)	27	r
Ceratinopsis romana (O.P.-Cambridge, 1872)	4	r
Dicymbium nigrum (Blackwall, 1834)	27	r
Diplocephalus foraminifer (O. P.-Cambridge, 1875)	1	
*Diplostyla concolor (Wider, 1834)	27	
Dismodicus elevatus (C.L. Koch, 1838)	27	r
Echemus angustifrons (Westring, 1861)	31	r
Lepthyphantes centromeroides Kulczyński, 1914	4, 18	
Lepthyphantes leprosus (Ohlert, 1865)	2, 4, 5, 30, 31	
*Linyphia hortensis Sundevall, 1830	2	
*Mansuphantes mansuetus (Thorell, 1875)	2	r
Micrargus herbigradus (Blackwall, 1854)	27	
Microlinyphia pusilla (Sundevall, 1830)	27	
Microneta viaria (Blackwall, 1841)	27, 31	
Neriene clathrata (Sundevall, 1830)	27	
Palliduphantes istrianus Kulczyński, 1914	17	BK
Porrhomma convexum (Westring, 1851)	4, 10, 30	
Tenuiphantes cristatus (Menge, 1866)	1	
*Tenuiphantes mengei Kulczyński, 1887	2	
Tenuiphantes tenuis (Blackwall, 1852)	22	
*Walckenaeria antica (Wider, 1834)	2	r
LIOCRANIDAE		
Liocranum rupicola (Walckenaer, 1830)	2	
LYCOSIDAE		
*Alopecosa pulverulenta (Clerck, 1757)	2	
Aulonia albimana (Walckenaer, 1805)	22	
*Hogna radiata (Latreille, 1817)	1	
Pardosa agrestis (Westring, 1861)	22	
*Pardosa agricola (Thorell, 1856)	2	
Pardosa alacris (C.L. Koch, 1833)	2	
*Pardosa amentata (Clerck, 1757)	2	
*Pardosa atomaria (C. L. Koch, 1847)	25, 27	
Pardosa hortensis (Thorell, 1872)	1, 2	
Pardosa lugubris (Walckenaer, 1802)	2	
Pardosa prativaga (L. Koch, 1870)	1	

Pardosa proxima (C.L. Koch, 1847)	29	
*Pirata piraticus (Clerck, 1757)	3	
*Piratula hygrophila (Thorell, 1872)	3	
Piratula latitans (Blackwall, 1841)	22	
Piraulta knorri (Scopoli, 1763)	27	
Trochosa ruricola (De Geer, 1778)	2	
Trochosa terricola Thorell, 1856	1	
Xerolycosa nemoralis (Westring, 1861)	1, 27	
NESTICIDAE		
Nesticus cellulanus (Clerck, 1757)	20, 21, 25, 30	
PHILODROMIDAE		
*Philodromus cespitum (Walckenaer, 1802)	24	
Tibellus macellus Simon, 1875	1	
Tibellus oblongus (Walckenaer, 1802)	27	
PHOLCIDAE		
Hoplopholcus forskali (Thorell, 1871)	10, 20	r
Pholcus opilionoides (Schrank, 1781)	27	
Pholcus phalangioides (Fuesslin, 1775)	2, 30	
PHRUROLITHIDAE		
*Phrurolithus festivus (C.L. Koch, 1835)	2	
*Phrurolithus szilyi Herman, 1879	2	
SALTICIDAE		
Ballus chalybeius (Walckenaer, 1802)	2	
*Heliophanus cupreus (Walckenaer, 1802)	2	
*Heliophanus kochi Simon, 1868	2	
*Philaeus chrysops (Poda, 1761)	25	
Phlegra fasciata (Hahn, 1826)	1	
*Pseudeuophrys lanigera (Simon, 1871)	25	r
*Pseudeuophrys obsoleta (Simon, 1868)	2	
Sitticus rupicola (C.L. Koch, 1837)	22	
TETRAGNATHIDAE		
Meta menardi (Latreille, 1804)	4, 5, 13, 19, 28	
Metellina merianae (Scopoli, 1763)	5, 13, 20	
*Pachignatha degeeri Sundevall, 1830	1	
THERIDIIDAE		
*Euryopis sexalbomaculata (Lucas 1846)	25	r
Steatoda albomaculatus (de Geer, 1778)	27	
Steatoda castanea (Clerck, 1757)	1, 3	
*Theridion betteni Wiehle, 1960		r
THOMISIDAE		
*Synema globosum (Fabricius, 1775)	2	
Xysticus erraticus (Blackwall, 1834)	2, 29	
Xysticus kochi Thorell, 1872	29	
Xysticus luctator L. Koch, 1870	1	
ZODARIIDAE		
Zodarion pirini Drensky, 1921	1	BK

Notes on species of conservation significance

The status of the taxa of conservation significance is determined according to what part of their population present in Vrachanska Mts. Bulgarian endemic species, some Balkan endemic with limited distribution and endangered species present in the world red lists (IUCN, ESC) assuming world significance. Balkan endemic species as a whole can be regarded as taxa of European importance as relics and rare forms have national significance.

Endemic species

Endemic species are confined to a single territory due to historical, ecological and physiological reasons. Most of them are seen as relics, which were formed as a result of complex palaeogeographic and paleoclimate changes taken place since mid-Tertiary to the present day. Their origin is different - preglacial (Tertiary) and glacial (Quaternary), which is why relics are a heterogeneous group, which confers specificity and uniqueness of fauna. In Vrachanska Mts. they comprises 7 (6.4 %) species. The group of Balkan endemic species (4 species, 2.9 %) are known from Bulgaria and other Balkan countries and comprises mainly cavernicolous and mountain faunistic elements. Here, *Centromerus lakatnikensis* and *Palliduphantes istrianus* are widespread in Bulgarian caves, while, *Inermocoelotes jurinitschi* and *Zodarion pirini* are well presented in Bulgarian mountains. Bulgarian endemic (3 species, 2.6 %) comprise also mountain and cavernicolous elements. Here, *Antrohyphantes sophianus* can be considers as mountain-mediterranean element. The species is found only in caves. It is closely related to the genus *Fagiella*, known only from caves in Bosnia. This provides us with grounds for claiming that it is a relict of ancient Mediterranean mountain fauna (Deltshev, 1990). *Centromerus bulgarianus* is a true, eyeless troglobite and it can be considered as a preglacal relict with wider range during the Tertiary. The species is rare, known from some caves in Western Stara Planina and Western Rhodopes Mts. (Deltshev & Petrov 2008).

Rare species

These species also have conservation value. In most cases they are attached to a limited type of biotope and require specific abiotic and biotic conditions, making them vulnerable to destruction of their habitats. In the park are established 30 rare species, which also increases its conservation value (Table 2).

Indicator species

The National Programme for Biological monitoring includes the species *Centromerus bulgarianus* and *C. lakatnikensis*. Besides these may be mentioned also: *Antrohyphantes sophianus*, *Lepthyphantes centromeroides*, *Porrhomma convexum*, *Meta menardi*. All are suitable for long-term investigation for analysis of the status of different habitat types. Suitable for monitoring of cave habitats and can be monitored by visual observations - the number of individuals per square meter in the appropriate habitat.

Areas and habitats of high conservation value for the group

Caves and Karst areas have high conservation value, characterized by high biodiversity and are refuges for the survival of invertebrate fauna. Vrachanska Mts. is among the richest in caves and cave fauna areas of the country and it is necessary to pay special attention to the development of specific conservation measures. Two main areas are outlined in this respect.
• The area of the reserve Vrachanski Karst, where the spiders greatest conservation value have the caves Ledenika (*Antrohyphantes sofianus, Lepthyphantes centromeroides, Porrhomma convexum, Meta menardi*) and Belyar (*Centromerus bulgarianus*).
• The area of Lakatnik and the caves Temnata Dupka (*Antrohyphantes sofianus, Lepthyphantes centromeroides, Porrhomma convexum*, *Meta menardi*, *Metellina merianae*) and Razhishkata Dupka (*Centromerus bulgarianus*, *C. lakatnikensis*, *Porrhomma convexum*) are caves with rich invertebrate fauna.

Conclusions

The faunistic diversity of the 110 spider species shows that the Vrachanska Mountain is a territory of high species richness. This conclusion is supported also by the existence of 7 endemic species which emphasize the local character of the fauna. It should be emphasized, that the newly reported 32 species, show that the list is not complete.

Acknowledgement: We are much obliged to our colleague Borislav Naumov for the assistance by preparing of the map.

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Паяци от Врачанска планина (Arachnida: Araneae)

ХРИСТО ДЕЛЧЕВ, СТОЯН ЛАЗАРОВ

(Резюме)

Настоящото изследване представлява критичен преглед на цялата публикувана информация, както и непубликувани данни събрани при спорадични проучвания през последните 70 години. Установени са 110 вида от 22 семейства, намерени във Врачанската планина, като 32 вида са новоустановени за планината. Установеният брой видове представлява около 10% от всички видове известни от България (1036 вида). Процентът на ендемитите е сравнително висок (30%) и подчертава локалния характер на аранеофауната.

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Faunistic diversity of Vrachanski Balkan Nature Park.
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Published records of limno-terrestrial tardigrades (Tardigrada: Heterotardigrada, Eutardigrada) from Vrachanski Balkan Nature Park

DILIAN GEORGIEV

Abstract. The following 6 species were reported for the area by Iharos (1961): *Echiniscus testudo*, *Ramazzottius oberhaeuseri*, *Hypsibius convergens*, *Macrobiotus hufelandi*, *Minibiotus intermedius*, *Paramacrobiotus richtersi.* Specimens from the *Macrobiotus hufelandi* species group were recorded and during present study from one locality.

Key words: limno-terrestrial, water bears, Bulgaria.

Introduction

Tardigrades or water bears are microscopic aquatic invertebrates usually 100-300 μm long (largest species seldom exceed 1000 μm). Some species called "limno-terrestrial" have evolved adaptations for draught and cold and use to live among mosses, lichen and detritus in terrestrial habitats. They are active only when thin water film exists on the substrate surface and can withstand periods of extreme dehydration forming cysts (cryptobiosis) (Horning *et al.* 1978; Northcote-Smith 2012).

So far only about 40 water bear species have been recorded from Bulgaria (McInnes 1994), reported by Iharos (1961; 1973; 1982) and Kaczmarek *et al.* (2011).

There were only a few tardigrade species recorded from Vrachanska Planina Mts. all reported by Iharos (1961) for the karstic region of Lakatnik. Specimens from the *Macrobiotus hufelandi* species group were recorded during present study from one locality.

Material and Methods

Literature survey was made considering all published data on tardigrades for Bulgaria.

A moss sample was collected by Prof. Dimitar Bechev from a limestone rock at Vratsata area on 28.02.2015. The sample was put into a paper bag and dried. In the laboratory the sample was further soaked in water for about 24 hours. After this time, water containing tardigrades, was decanted and examined under a stereomicroscope and a light microscope.

The taxonomy follows Degma *et al.* (2015).

Results

Phylum TARDIGRADA Doyère, 1840

Class HETEROTARDIGRADA Marcus, 1927

Order ECHINISCOIDEA Richters, 1926

Family Echiniscoididae Kristensen & Hallas, 1980

Echiniscus testudo (Doyère, 1840)

Class EUTARDIGRADA Richters, 1926

Order PARACHELA Schuster, Nelson, Grigarick & Christenberry, 1980

Family Macrobiotidae Thulin, 1928

***Ramazzottius* oberhaeuseri (Doyère, 1840)**

Remark: reported as *Hypsibius*.

***Hypsibius convergens* (Urbanowicz, 1925)**

***Macrobiotus hufelandi* Schultze, 1833**

Remark: 5 specimens of the *hufelandi* group were collected from Vratsata area (near Vratsa) during present study.

***Minibiotus intermedius* (Plate, 1888)**

Remark: reported as *Macrobiotus*.

***Paramacrobiotus richtersi* Murray, 1911**

Remark: reported as *Macrobiotus*.

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Публикувани данни за сухоземни тардигради (Tardigrada: Heterotardigrada, Eutardigrada) от Природен парк Врачански Балкан

ДИЛЯН ГЕОРГИЕВ

(Резюме)

Шест вида сухоземни тардигради са съобщени от териорията на парка от Iharos (1961): *Echiniscus testudo*, *Ramazzottius oberhaeuseri*, *Hypsibius convergens*, *Macrobiotus hufelandi*, *Minibiotus intermedius* и *Paramacrobiotus richtersi*. Индивиди от групата видове *„hufelandi"* бяха събрани и по време на настоящото проучване от мъх по скали в района на Вратцата.

Bechev, D. & Georgiev, D. (Eds.),
Faunistic diversity of Vrachanski Balkan Nature Park.
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Mayflies (Ephemeroptera, Insecta) from Vrachanska Planina Mountains

YANKA VIDINOVA, LYUBOMIR KENDEROV

Abstract. Eighteen species, belonging to 7 subgenera, 11 genera and 7 families, are currently known from 8 sites of streams and rivers on the territory of Vrachanska Planina Mts. They represent 15,52 % of the mayflies known up to now for Bulgaria. Twelve species are newly reported for the mountain. Brief faunistic and zoogeographical notes are given. The conservation status of the species is also discussed.
Key words: Ephemeroptera, faunistics, Vrachanska Planina Mts., NW Bulgaria.

Introduction

From faunistic point of view Bulgaria is among the countries with relatively well studied mayfly fauna. The known species represent approximately 95 % from the supposed by country (Sartori, 2001). So far, a total of 116 species, belonging to 15 families, 32 genera and 21 subgenera of the order Ephemeroptera are established in Bulgaria (Presolska, 2014). Despite the high level of knowledge on Ephemeroptera in the country as a whole, there are still areas for which no actual data are available.

The main water bodies in Vrachanska Planina Mts. flow into Ogosta and Iskar Rivers watersheds (Hristova, 2012). Although Bulgarian Danube tributaries are objects of long-term hydrobiological investigations (Janeva, 1991; Russev *et al.*, 1994, etc.), there is a lack of faunistic information concerning the above mentioned region. Vidinova & Russev (2009) and Presolska (2014) pointed out single localities of some leptophlebiids and ecdyonurids in the region. Braasch et al. (1985) reported one *Rhithrogena*- species as new for Bulgarian fauna from a locality adjacent to the Vrachanski Balkan Nature Park border.

The aim of the present work is to summarize the literature and recent unpublished faunistic data on Ephemeroptera from rivers and streams in Vrachanska Planina Mts.

Material and Methods

This paper includes faunistical information from both published and unpublished data concerning mayfly fauna of the Vrachanska Planina Mts. The materials are mainly in larval stage and originate from 8 river Sites, which are referred to the relevant UTM code (Fig.1, Table 1).

Newly reported ones are part of hydrobiological samples, collected in June 2013 from the main water catchments in Vrachanski Balkan Nature Park using the adopted multi-habitat sampling technique (Cheshmedjiev *et al.*, 2011).

The specimens were identified using a stereomicroscope Olympus CZ2 and microscope Zeiss Jena Ergaval according to the original descriptions of species as well as the summary works on European species of the genera *Baetis*, *Rhithrogena* and *Ecdyonurus* (Müller-Liebenau, 1969; Hefti, Tomka & Zurwerra, 1989; Tomka & Rasch, 1993; Bauernfeind & Humpesch, 2001).

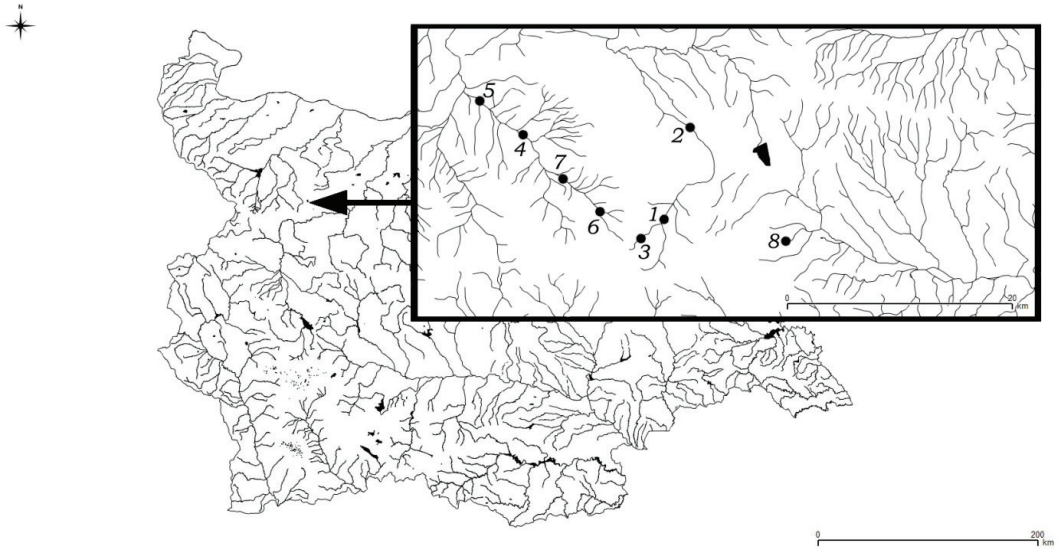

Fig. 1. Map of the localities (The numbers of sites refer to those in Table 1).

The faunal list follows the nomenclature of Bauernfeind & Soldan (2012), as genera and subgenera are listed in alphabetical order. The division of *Baetis*- and *Rhithrogena*-species by groups and subgroups follows Müller-Liebenau (1969) and Tomka & Rasch (1993).

Species distribution is given in the text with reference to their known localities including Site №, UTM-code, finding date and number of specimens.

Table 1. List of the known localities of mayflies in the Vrachanska Planina Mts.

Site №	River	Locality	UTM-Code	Geographical coordinates	Altitude (m a.s.l.)
1	Leva	upstream Zgorigrad	GN08	N 43.169528 E 23.506	564
2	Leva	downstream Vratsa	GN08	N 43.22275 E 23.526639	316
3	Desna	near mine “Mir”	GN08	N 43.158472 E 23.487472	801
4	Cherna	at Gorno Ozirovo	FN98	N 43.218931 E 23.393361	320
5	Cherna	upstream Dolno Ozirovo	FN99	N 43.238389 E 23.359417	278
6	Gluharska	upper part	FN98	N 43.174167 E 23.45425	608
7	Gluharska	lower part	FN98	N 43.193167 E 23.425	412
8	Tributary to Iskar River	downstream Pavolche Village	GN18	N 43.156975 E 23.602778	483

Zoogeographical classification is by Haybach & Jacob (2010) and is based on the current knowledge of species distribution.

The map of the established localities is prepared by Adobe Photoshop CS on GIS-layer covering the river net in Bulgaria.

Results and discussion

Faunistic list

Superfamily Baetoidea

Family Baetidae Leach, 1815

Genus *Baetis* Leach, 1815

***Baetis (Baetis) alpinus* (Pictet,1843)**

Material: Site 1 (GN08): 11.06.2013- 2 la; Site 3 (GN08): 11.06.2013, 4 la; Site 6 (FN98): 12.06.2013, 1 la; Site 7 (FN98): 12.06.2013, 2 la.

Notes: First record for the Vrachanska Planina Mts.

***Baetis (B.) buceratus* Eaton, 1870**

Material: Site 4 (FN98): 12.06.2013, 1 la.

Notes: First record for the Vrachanska Planina Mts.

***Baetis (B.) fuscatus* (Linnaeus, 1761)**

Material: Site 4 (FN98): 12.06.2013, 10 la.

Notes: First record for the Vrachanska Planina Mts.

***Baetis (Nigrobaetis) muticus* (Linnaeus, 1758)**

Material: Site 3 (GN08): 11.06.2013, 3 la.

Notes: First record for the Vrachanska Planina Mts.

***Baetis* (*Rhodobaetis*) *rhodani* (Pictet, 1843)**

Material: Site 1 (GN08): 11.06.2013, 2 la; Site 4 (FN98): 12.06.2013, 18 la; Site 5 (FN99): 12.06.2013, 5 la; Site 6 (FN98): 12.06.2013, 1 la.

Notes: First record for the Vrachanska Planina Mts.

Superfamily Heptagenioidea

Family Oligoneuriidae Ulmer, 1914

Genus *Oligoneuriella* Ulmer, 1924

***Oligoneuriella rhenana* (Imhoff, 1852)**

Material: Site 4 (FN98): 12.06.2013, 39 la; Site 5 (FN99): 12.06.2013, 17 la.

Notes: First record for the Vrachanska Planina Mts.

Family Heptageniidae Needham, 1901

Genus *Ecdyonurus* Eaton, 1868

***Ecdyonurus (Ecdyonurus) dispar* (Curtis, 1834)**

Material: Site 2 (GN08): 06.6.1933, 3 la (Presolska, 2014); Site 4 (FN98): 12.06.2013, 4 la; Site 5 (FN98): 12.06.2013, 2 la.

***Ecdyonurus (E.) insignis* (Eaton, 1870)**

Material: Site 4 (FN98): 12.06.2013, 6 la.

Notes: First record for the Vrachanska Planina Mts.

***Ecdyonurus (E.) venosus* (Fabricius, 1775)**

Material: Site 4 (FN98): 12.06.2013, 1 la.

Notes: First record for the Vrachanska Planina Mts.

***Ecdyonurus (Helvetoraeticus) helveticus* (Eaton, 1883)**

Material: Site 1(GN08): 11.06.2013, 11 la.

Notes: First record for the Vrachanska Planina Mts.

Genus *Epeorus* Eaton, 1881

***Epeorus (Epeorus) assimilis* Eaton, 1885**

Material: Site 6 (FN98): 12.06.2013, 2 la; Site 7 (FN98): 12.06.2013, 15 la.
Notes: First record for the Vrachanska Planina Mts.

Genus *Rhithrogena* Eaton, 1881

***Rhithrogena iridina* (Kolenati, 1839)**

Material:Site 3 (GN08): 11.6.2013, 1 ♂ la.
Notes: Rare species.

Superfamily Leptophlebioidea

Family Leptophlebiidae Banks, 1900

Genus *Choroterpes* Eaton, 1881

***Choroterpes (Choroterpes) picteti* (Eaton, 1871)**

Material: Site 8 (GN18): 24.6.1961, 1 la (Vidinova & Russev, 2009: 152).

Genus *Habroleptoides* Schoenemund, 1929

***Habroleptoides confusa* Sartori & Jacob, 1986**

Material: Site 8 (GN18): 24.6.1961, 2 la (Presolska, 2014).

Genus *Habrophlebia* Eaton, 1881

***Habrophlebia lauta* Eaton, 1884**

Material: Site 2 (GN08): 23.6.1961, 3 la; Site 8 (GN18): 24.6.1961, 2 la (Vidinova & Russev, 2009: 156).

Superfamily Ephemeroidea

Family Ephemeridae Latreille,1810

Genus *Ephemera* Linnaeus, 1758

***Ephemera (Ephemera) danica* Müller, 1764**

Material: Site 6 (FN98): 12.06.2013, 3 la; Site 7 (FN98): 12.06.2013, 13 la;
Notes: First record for the Vrachanska Planina Mts.

Superfamily Ephemerelloidea

Family Ephemerellidae Klapálek, 1909

Geneus *Ephemerella* Walsh, 1863

***Ephemerella ignita* (Poda, 1761)**

Material: Site 2 (GN08): 06.6.1933, 2 la, 23.6.1961, 3 la; Site 8 (GN18): 24.6.1961, 12 la (Presolska, 2014); Site 4 (FN98): 12.06.2013, 8 la; Site 5 (FN99): 12.06.2013, 10 la.

Superfamily Caenoidea

Family Caenidae Newman, 1853

Genus *Caenis* Stephens, 1836

***Caenis macrura* Stephens, 1835**

Material: Site 4 (FN98): 12.06.2013, 1 la; Site 5 (FN99): 12.06.2013, 2 la.
Notes: First record for the Vrachanska Planina Mts.

Faunistic notes

Till now 18 mayfly species are established in the territory of Vrachanska Planina Mts. They belong to 7 families, 11 genera and 7 subgenera and represent 15.52 % of all known Bulgarian species. These are mainly widespread species (as defined in Presolska, 2014), as only *Rh. iridina* represents the group of species with limited distribution. The four mayflies, referred as "widespead" and/or "euribionts" for Bulgaria, are also found here – *E. (E.) assimilis, E. (E.) danica, E. ignita and C. macrura (*Vidinova & Russev, 1997; Presolska, 2014). *The species Ch. (Ch.) picteti* is widely distributed predominantly in the Danube tributaries but less rare in the rest of the country (Vidinova & Russev, 2009).

Due to the mountainous type of the water courses in this area most of the mayflies here are typical rheobionts – these are all heptageniid, leptophlebiid, baetid and *oligoneuriid species.*

Conservation status and zoogeographical notes

Gueorguiev et al. (1998) characterized the level of rarity for Ephemeroptera order in Bulgaria as low and listed 19 species in this category. Presolska (2014) update their number to 25. From all the above listed species, *Rhithrogena iridina* is the only mayfly which is included in this category. Dietrich Braasch *found its male subimago at* Botunja River, near Vratsa (13.5.1969) and later *Braasch et al. (1985: 126)* reported it as new for Bulgarian fauna. The finding of the species nowadays suggests steady populations in this area.

Ephemeroptera is among the orders with moderate to low level of endemism (Gueorguiev et al., 1998; Presolska, 2014). According to data mentioned above, no any endemic or relict mayflies were found to occur in Vrachanska Planina Mts.

From the zoogeographical point of view the Mediterranean complex predominates here, represented by 8 species (*O. rhenana, E.* (*E.*) *dispar, E.* (*E.*) *venosus, E.* (*E.*) *assimilis, Ch.* (*Ch.*) *picteti, H. confusa, E.* (*E.*) *insignis* and *E.* (*H.*) *helveticus*, followed by representatives of the Pontic complex - (*B.* (*B.*) *buceratus, H. lauta* and *C. macrura*. The Siberian and Montano-Mediterranean complexes are presented by 2 species each - *E.* (*E.*) *danica* and *E. ignita*, and *B.* (*B.*) *alpinus* and *R. iridina,* respectively.

As the mayflies constitute a considerable part of the aquatic macroinverterate communities and due to their pollution indicator capacity, further complete faunistic and ecological studies are needed.

Acknowledgments

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Еднодневки (Ephemeroptera, Insecta) от Врачанската планина

ЯНКА ВИДИНОВА, ЛЮБОМИР КЕНДЕРОВ

(Резюме)

Осемнадесет вида еднодневки, принадлежащи към 7 подрода, 11 рода и 7 семейства, са установени понастоящем от 8 пункта от потоци и реки на територията на Врачанската планина. Те съставляват 15,52 % от известните за страната видове от разред Ephemeroptera. Дванадесет от тях се съобщават за първи път за района. Дават се кратки фаунистични и зоогеографски бележки. Обект на дискусия е също и консервационният статус на някои от установените видове.

Bechev, D. & Georgiev, D. (Eds.),
Faunistic diversity of Vrachanski Balkan Nature Park.
ZooNotes, Supplement 3, Plovdiv University Press,
Plovdiv, 2016

Dragonflies (Odonata) from Vrachanska Planina Mountains

ANELIYA PAVLOVA, DIMITAR BECHEV

Abstract. Till now, 8 species of dragonflies are found in Vrachanska Planina Mountains. All data presented here are from Bulgarian Odonata database.

Key words: Odonata, Western Stara Planina, Bulgaria.

Material and Methods

The paper presents all information about dragonflies in Vrachanska Planina Mts. included in Bulgarian Odonata database. The database, active in the past on www.odonata.org, now is not available.

Species List

ZYGOPTERA

Calopterygidae

***Calopteryx virgo* (Linnaeus, 1758)**

Near Lakatnik Railway Station (Arnold, 1984).

Lestidae

***Lestes sponsa* (Hansemann, 1823)**

Vratsa (Nedelkov, 1923).

***Sympecma fusca* (Vander Linden, 1820)**

Nar Cherepish Monastery; on the eco-trail around Ledenika Cave (observation).

Platycnemididae

***Platycnemis pennipes* (Pallas, 1771)**

Near Cherepish Monastery (observation).

ANISOPTERA

Aeschnidae

***Aeshna mixta* Latreille, 1805**

Near entrance of Ledenika Cave; near Forestry House (observation).

Gomphidae

***Onychogomphus forcipatus* (Linnaeus, 1758)**

Near Cherepish Monastery (observation).

Corduliidae

***Somatochlora metallica* (Vander Linden, 1825)**

N from the town of Vratsa (Nedelkov, 1923; Marinov, 1999; Marinov, 2001).

Libellulidae

***Sympetrum sanguineum* (Muller, 1764)**

Near Cherepish Monastery (observation).

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Водни кончета (Odonata) от Врачанска планина

АНЕЛИЯ ПАВЛОВА, ДИМИТЪР БЕЧЕВ

(Резюме)

Представени са данни за 8 вида водни кончета от Врачанска планина. Данните са от Bulgarian Odonata database, която вече не е налична (преди налична на: www.odonata.org).

Bechev, D. & Georgiev, D. (Eds.),
Faunistic diversity of Vrachanski Balkan Nature Park.
ZooNotes, Supplemen 3, Plovdiv University Press,
Plovdiv, 2016

Stoneflies (Plecoptera, Insecta) from Vrachanska Planina Mountains

VIOLETA TYUFEKCHIEVA, VESELA EVTIMOVA, LYUBOMIR KENDEROV

Abstract. This work summarizes both literature and new data on the fauna of Plecoptera (Insecta) of the Vrachanska Planina Mountains, Bulgaria. A total of 20 species and seven subspecies are known from the mountain. The recorded stoneflies belong to 12 genera and seven families. They represent 25% of the 108 stoneflies currently known from Bulgaria. Among the 27 species that have been recorded, two are Critically Endangered (CR), one –Endangered (EN) and ten – Vulnerable (VU). From a zoogeographical point of view, one subspecies and four species from the Plecoptera, recorded in Vrachanska Planina Mts., are Balkan endemics: *Capnopsis schilleri balcanica* Zwick, 1984, *Leuctra balcanica* Rauser, 1965, *Leuctra hirsuta* Bogoescu, Tabacaru, 1960, *Nemoura braaschi* Joost, 1970 and *Isoperla belai* Illies, 1963. Four of the recorded species are rare for Bulgaria.

Key words: Plecoptera, conservation status, faunistic diversity, Bulgaria.

Introduction

The first data on the stoneflies of the Vrachanska Planina Mts. (Western Stara Planina Mts.) were reported by Braasch & Joost (1971a, b). Later Gueorguiev *et al.* (1998) presented data on the endemic and rare stonefly species in their contribution studying the biological diversity of Insects of Bulgaria. Hubenov *et al.* (2000) summarised all known data for one of the biggest National parks in the country – Central Balkan. More recently Tyufekchieva *et al.* (2013) reported faunistic and ecological information on some species from Bulgaria. The aim of this study is to summarise all data concerning faunistic diversity of the stonefly species in the Vrachanska Planina Mts., Bulgaria, and to present information on their distribution and IUCN Red List categories at a regional level.

Material and Methods

The current review of Plecoptera species in the Vrachanska Planina Mts. based on the available literature and new data. Published records are presented according to literature sources and UTM code numbers. New data of individual records are listed in details: code number, name of watercourse, GPS coordinates, altitude, day, month and year. All their geographic coordinates are provided by Bulgarian UTM Directory computer programme (Michev, 1999). The stoneflies are currently available at the Institute of Biodiversity and Ecosystem Research, BAS (IBER-BAS, Sofia).

The checklist comprises the following data: valid taxa name, published and new records, notes. The used nomenclature and systematics are after Muranyi (2008).

The taxa (species and subspecies) are classified based on the global categories and criteria of IUCN, Version 2014.3 (IUCN, 2014).

Results

Records of Plecoptera species

Order Plecoptera

Family Taeniopterygidae Klapalek, 1905

Genus *Rhabdiopteryx* Klapalek, 1902

***Rhabdiopteryx neglecta neglecta* (Albarda, 1889)**

Localities: FN88: Botunya River, 550 m a.s.l. (Braasch & Joost, 1971a: 269; Gueorguiev *et al.* 1998: 174; Tyufekchieva *et al.* 2013: 95).

Family Capniidae Klapálek, 1905

Genus *Capnia* Pictet, 1841

***Capnia bifrons* (Newman, 1839)**

Localities: GN08: Leva River, tributary of the Botunya River, 500 m a.s.l. (Braasch & Joost, 1971b: 63).

Genus *Capnopsis* Morton, 1896

***Capnopsis schilleri balcanica* Zwick, 1984**

Localities: GN08: Leva River, tributary of the Botunya River, 950 m a.s.l. (Braasch & Joost, 1971a: 279).

Note: From a zoogeographical point of view *C. schilleri balcanica* is Balkan endemic.

Family Leuctridae Klapalek, 1905

Genus *Leuctra* Stephens, 1835

***Leuctra balcanica* Rauser, 1965**

Localities: FN98: Gluharska River, tributary of the Botunya River, 500 – 1000 m a.s.l. (Braasch & Joost, 1971a: 276).

Note: *L. balcanica* is rare and Balkan endemic species.

***Leuctra hippopus* Kempny, 1899**

Localities: FN98: Gluharska River, tributary of the Botunya River, 500 – 1000 m a.s.l. (Braasch & Joost, 1971a: 276); GN08: Leva River, tributary of the Botunya River, 500 m a.s.l. (Braasch & Joost, 1971b: 62).

***Leuctra hirsuta* Bogoescu, Tabacaru, 1960**

Localities: FN98: Gluharska River, N 43^0 10' 27.0" and E 23^0 27' 15.3", 608 m a.s.l., 12.06.2013.

Note: From a zoogeographical point of view *L. hirsuta* is Balkan endemic. This is first record for the Vrachanska Planina Mountain.

***Leuctra inermis* Kempny, 1899**

Localities: FN98: Gluharska River, tributary of the Botunya River, 500 – 1000 m a.s.l. (Braasch & Joost, 1971a: 276).

***Leuctra pseudosignifera* Aubert, 1954**

Localities: GN08: springs of the Botunya River, near Vratsa (Braasch & Joost, 1971b: 62).

Family Nemouridae Newman, 1853

Genus *Amphinemura* Ris, 1902

***Amphinemura triangularis* (Ris, 1902)**

Localities: FN98: Gluharska River, tributary of the Botunya River, 500 – 1000 m a.s.l. (Braasch & Joost, 1971a: 270); GN08: Leva River, tributary of the Botunya River, 500 m a.s.l. (Braasch & Joost, 1971b: 60).

Genus *Protonemura* Kempny, 1898

***Protonemura intricata intricata* (Ris, 1902)**

Localities: FN98: Gluharska River, tributary of the Botunya River, 500 – 1000 m a.s.l. (Braasch & Joost, 1971a: 275); FN98: Gluharska River, N 43^0 10' 27.0" and E 23^0 27' 15.3", 608 m a.s.l., 12.06.2013; FN99: Cherna River, above Dolno Ozirovo Village, N 43^0 14' 18.2" and E 23^0 21' 33.9", 278 m a.s.l., 12.06.2013; GN08: Desna River, above the mine, N 43^0 09' 30.5" and E 23^0 29' 14.9", 801 m a.s.l., 11.06.2013.

***Protonemura praecox praecox* (Morton, 1894)**

Localities: FN98: Gluharska River, tributary of the Botunya River, 500 – 1000 m a.s.l. (Braasch & Joost, 1971a: 270); FN98: Gluharska River, N 43^0 10' 27.0" and E 23^0 27' 15.3", 608 m a.s.l., 12.06.2013; GN08: Leva River, tributary of the Botunya River, 500 m a.s.l. (Braasch & Joost, 1971b: 60).

Genus Nemoura Latreille, 1796

***Nemoura braaschi* Joost, 1970**

Localities: FN98: tributary of the Botunya River, 500 – 1000 m a.s.l. (Braasch & Joost, 1971a: 270); GN08: Leva River, tributary of the Botunya River, 500 m a.s.l. (Braasch & Joost, 1971b: 60).

Note: From a zoogeographical point of view *N. braaschi* is Balkan endemic.

***Nemoura cinerea cinerea* (Retzius, 1783)**

Localities: FN98: Gluharska River, tributary of the Botunya River, 500 – 1000 m a.s.l. (Braasch & Joost, 1971a: 271); GN08: Leva River, tributary of the Botunya River, 500 m a.s.l. (Braasch & Joost, 1971b: 61).

***Nemoura flexuosa* Aubert, 1949**

Localities: GN08: Leva River, tributary of the Botunya River, 500 m a.s.l. (Braasch & Joost, 1971b: 61); GN08: Leva River, above Zgorigrad Town, N 43^0 10' 10.3" and E 23^0 30' 21.6", 564 m a.s.l., 11.06.2013.

***Nemoura subtilis* Klapálek, 1895**

Localities: FN98: Gluharska River, tributary of the Botunya River, 500 – 1000 m a.s.l. (Braasch & Joost, 1971a: 273).

***Nemoura uncinata* Despax, 1934**

Localities: FN98: Gluharska River, tributary of the Botunya River, 500 – 1000 m a.s.l. (Braasch & Joost, 1971a: 271); GN08: Leva River, tributary of the Botunya River, 500 m a.s.l. (Braasch & Joost, 1971b: 61).

Family Perlodidae Klapálek, 1909

Genus *Perlodes* Banks, 1903

***Perlodes microcephalus* (Pictet, 1833)**

Localities: FN98: Gluharska River, tributary of the Botunya River, 500 – 1000 m a.s.l. (Braasch & Joost, 1971a: 282).

Genus *Isoperla* Banks, 1906

***Isoperla belai* Illies, 1963**

Localities: FN98: Gluharska River, tributary of the Botunya River, 500 – 1000 m a.s.l. (Braasch & Joost, 1971a: 283); GN08: Leva River, tributary of the Botunya River, 500 m a.s.l. (Braasch & Joost, 1971b: 63).

Note: From a zoogeographical point of view *I. belai* is Balkan endemic.

***Isoperla buresi* Rauser, 1962**

Localities: FN98: Gluharska River, tributary of the Botunya River, 500 – 1000 m a.s.l. (Braasch & Joost, 1971a: 283); GN08: Desna River, above the mine, N 43^0 09' 30.5" and E 23^0 29' 14.9", 801 m a.s.l., 11.06.2013

***Isoperla tripartita tripartita* Illies, 1954**

Localities: GN08: Leva River, tributary of the Botunya River, 950 m a.s.l. (Braasch & Joost, 1971a: 284).

Family Chloroperlidae Okamoto, 1912

Genus *Siphonoperla* Zwick, 1967

***Siphonoperla neglecta* (Rostock, 1881)**

Localities: FN98: Gluharska River, tributary of the Botunya River, 500 – 1000 m a.s.l. (Braasch & Joost, 1971a: 288); GN08: springs of the Botunya River, near Vratsa Town (Braasch & Joost, 1971b: 64).

***Siphonoperla torrentium transsylvanica* (Kis, 1963)**

Localities: FN98: Gluharska River, tributary of the Botunya River, 800 m a.s.l. (Braasch & Joost, 1971a: 289; Gueorguiev *et al.* 1998: 174).

Note: *S. torrentium transsylvanica* is a rare species.

Family Perlidae Latreille, 1802

Genus *Perla* Geoffroy, 1762

***Perla abdominalis* Burmeister, 1839**

Localities: FN98: Gluharska River, tributary of the Botunya River, 500 – 1000 m a.s.l. (Braasch & Joost, 1971a: 285).

***Perla marginata* (Panzer, 1799)**

Localities: FN98: Gluharska River, tributary of the Botunya River, 500 – 800 m a.s.l. (Braasch & Joost, 1971a: 285).

***Perla pallida* Guérin-Méneville, 1838**

Localities: FN98: Gluharska River, tributary of the Botunya River, 500 – 800 m a.s.l. (Braasch & Joost, 1971a: 287); FN98: Gluharska River, N 43^0 10' 27.0" and E 23^0 27' 15.3", 608 m a.s.l., 12.06.2013.

Genus *Dinocras* Klapálek, 1907

***Dinocras cephalotes* (Curtis, 1827)**

Localities: FN98: Gluharska River, N 43^0 11' 35.4" and E 23^0 25' 30.0", 412 m a.s.l., 12.06.2013.

Note: First record for the Vrachanska Planina Mts.

***Dinocras megacephala* (Klapalek, 1907)**

Localities: FN98: Gluharska River, N 43^0 11' 35.4" and E 23^0 25' 30.0", 412 m a.s.l., 12.06.2013.

Note: First record for the Vrachanska Planina Mts.

Faunistic and zoogeographical notes

Presently only five localities of stoneflies are known from the Vrachanska Planina Mts., Bulgaria (Fig. 1) with a total of 20 stonefly species and seven subspecies recorded. They represent 25% of the total number (108) of the known taxa of this order in Bulgaria. The recorded taxa belong to seven families and 12 genera of the order Plecoptera.

The Nemouridae family is the richest in taxa with eight species, followed by Leuctridae and Perlidae (with five species each), Perlodidae (with four), Capniidae and Chloroperlidae (with two species each).The family Taeniopterygidae is presented only by a single species.

Plecoptera order has a moderate level of endemism. Five Balkan endemics and four rare species have been established within the territory of the Vrachanska Planina Mts. They represent 10.5% of all 38 rare stoneflies species and 22.7% of all Balkan endemics known from Bulgaria (Tyufekchieva, 2014). The endemic and rare species have a high conservation value (Table 1). Among the 27 species that have been recorded, two are Critically Endangered (CR), one is Endangered (EN) and ten are Vulnerable (VU) as classified according to the IUCN (2014) red list.

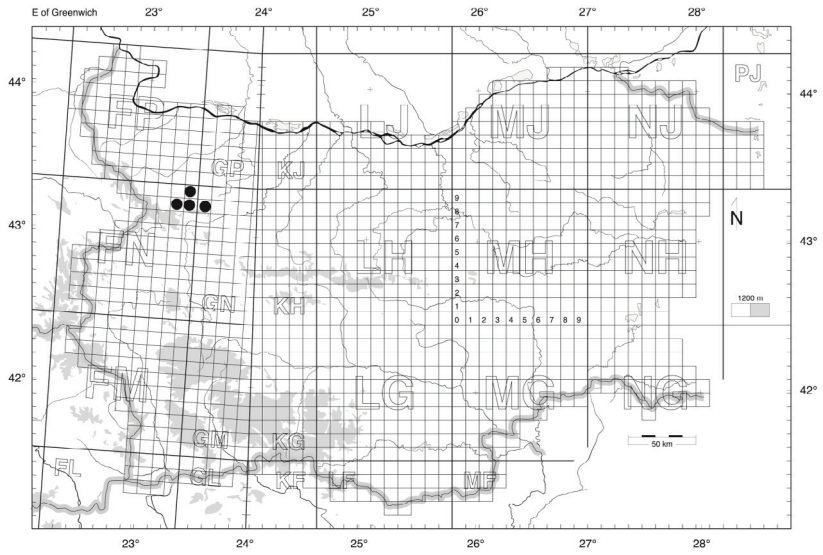

Fig. 1. UTM – grid of Plecoptera data from Vrachanska Planina Mts. Legend: FN88: Botunya River; FN98: Gluharska River; FN99: Cherna River, above Dolno Ozirovo Village; GN08: Leva River, above Zgorigrad Town; Desna River, above the mine.

Table 1. Red List of Plecoptera from the Vrachanska Planina Mts. Legend: CR– Critically Endangered; EN– Endangered; VU– Vulnerable; NT– Nearly Threatened; LC– Least Concern; DD– Data Deficient.

Taxa	IUCN categories
Taeniopterygidae	
Rhabdiopteryx neglecta neglecta (Albarda, 1889)	CR
Capniidae	
Capnia bifrons (Newman, 1839)	VU
Capnopsis schilleri balcanica Zwick, 1984	EN
Leuctridae	
Leuctra balcanica Rauser, 1965	DD
Leuctra hippopus Kempny, 1899	LC
Leuctra hirsuta Bogoescu, Tabacaru, 1960	VU
Leuctra inermis Kempny, 1899	LC
Leuctra pseudosignifera Aubert, 1954	LC
Nemouridae	
Amphinemura triangularis (Ris, 1902)	LC
Protonemura intricata intricata (Ris, 1902)	LC
Protonemura praecox praecox (Morton, 1894)	LC
Nemoura braaschi Joost, 1970	VU
Nemoura cinerea cinerea (Retzius, 1783)	LC
Nemoura flexuosa Aubert, 1949	VU
Nemoura subtilis Klapálek, 1895	VU
Nemoura uncinata Despax, 1934	NT
Perlodidae	
Perlodes microcephalus (Pictet, 1833)	LC
Isoperla belai Illies, 1963	VU
Isoperla buresi Rauser, 1962	VU
Isoperla tripartita tripartita Illies, 1954	NT
Chloroperlidae	
Siphonoperla neglecta (Rostock, 1881)	VU
Siphonoperla torrentium transsylvanica (Kis, 1963)	CR
Perlidae	
Perla abdominalis Burmeister, 1839	LC
Perla marginata (Panzer, 1799)	LC
Perla pallida Guérin-Méneville, 1838	VU
Dinocras cephalotes (Curtis, 1827)	VU
Dinocras megacephala (Klapalek, 1907)	LC

Discussion

The geographical position of Bulgaria in the southeastern corner of the European continent, the complex of paleogeographic and paleoclimatic past, combined with the presence of sufficient freshwater resources are the major driving factors favouring the existence of rich and unique Plecoptera fauna (Tyufekchieva *et al.* 2013). Based on the current knowledge of the group of stoneflies from Vrachanska Planina Mts. we consider that many of the springs are still not investigated. Therefore, we conclude that it is likely that the taxa list presented in this paper is not exhaustive.

European Plecoptera (inclusive of Bulgarian stonefly taxa) as a whole are an endangered group. Among them 43 taxa fall into three or more vulnerability categories and are the most threatened taxa from the group (Tierno de Figueroa *et al.* 2010). According to the Red List of stoneflies (IUCN, 2014), the species of *Perla abdominalis* is classified as Regionally Extinct (RE) in Italy (Fochetti *et al.* 1998) and as Critically Endangered (CR) in Switzerland (Lubini *et al.* 2012). The species of *Protonemura praecox* is classified as Endangered (EN), while *Perlodes microcephalus* is classified as Vulnerable (VU) in Serbia (Petrović *et al.* 2014). The above mentioned three species are classified as Least Concern (LC) in Bulgaria. Nevertheless, about 50% of the stoneflies from Bulgaria are regionally threatened according IUCN criteria. One species is Regionally Extinct (RE), 26 – Critically Endangered (CR), 10 – Endangered (EN) and 18 are Vulnerable (VU) (Tyufekchieva, 2014).

Moreover, according to Dunn (2005), the study of insect extinctions has been highly neglected in the past. Only 70 modern insect extinctions have been documented, whereas the same author reports that, according to a rough estimate, more than 44,000 insect extinctions may have occurred in the past 600 years.Therefore, we can speculate that the extinction rate of Plecoptera is much higher. Further investigations are needed in order to study stonefly populations and provide scientific basis for supporting their biodiversity and its conservation.

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Перли (Plecoptera, Insecta) от Врачанска планина (България)

ВИОЛЕТА ТЮФЕКЧИЕВА, ВЕСЕЛА ЕВТИМОВА, ЛЮБОМИР КЕНДЕРОВ

(Резюме)

От Врачанска планина са съобщени 20 вида и седем подвида, които принадлежат към седем семейства и 12 рода от разред Plecoptera (Insecta). Те представляват 25% от всички 108 известни до сега перли за България. Три вида се съобщават за първи път в проучвания регион. Установени са пет ендемита и четири редки вида. Определен е природозащитния статус на известните видове перли от Врачанска планина. Двадесет и седем вида са отнесени към категориите и критериите на IUCN, като два вида са "критично застрашени" (CR), един вид е „застрашен" (EN), а други десет вида са "уязвими" (VU).

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Orthoptera, Blattodea and Mantodea of Vrachanska Planina Mountains

ALEXI POPOV, DRAGAN CHOBANOV

Abstract. So far, 81 species of the orthopterid orders are found in Vrachanska Planina according to the published and original data (Orthoptera – 79 species, Blattodea and Mantodea – one species each). Other 6 species of Orthoptera have been recorded in the areas up to 5 km beyond the borders of the mountain. First records from Vrachanska Planina are reported here for 1 order, 1 superfamily, 2 families, 5 subfamilies, 8 tribes, 16 genera, 3 subgenera and 31 species. Published and original material of 70 species is checked and identified. A subspecies is synonymized: *Ephippiger ephippiger ephippiger* (Fiebig, 1784) (= *Ephippiger ephippiger balkanicus* Andreeva, 1985, **syn. n.**). Typical mountain species with a lower limit of distribution in Bulgaria running through the highest ridge of Vrachanska Planina are *Psorodonotus fieberi*, *Gomphocerus sibiricus* and *Myrmeleotettix maculatus*. The reported species are divided in 25 categories by chorology and 14 categories by origin. Most numerous according to chorotypes are the Eurosiberian (20 %) followed by the Central and South European (16 %) species as well as according to origin the Siberian (23 %) followed by the Central European (19 %) faunal elements. Endemic taxa of Orthoptera in Vrachanska Planina are 1 genus, 5 species and 1 subspecies, one of which is Bulgarian endemic species and the remaining taxa are Balkan endemics. The northernmost, westernmost, easternmost and southernmost localities in the ranges of 1 genus and 4 species are situated in Vrachanska Planina. The investigated area lies at the northern or eastern range limits of other 3 genera, 2 species and 1 subspecies. *Leptophyes discoidalis* and *Miramella* sp. are among the rarest species of Orthoptera in Bulgaria.

Key words: Orthoptera, Western Stara Planina, Bulgaria, new synonym, distribution, zoogeography.

Introduction

Preparation of the present book affords a good opportunity to summarize the knowledge on Orthoptera of Vrachanska Planina and to add new information. The availability of most of the published specimens in collections allowed revising older records with a view to current concepts on the content and systematic position of the taxa.

Taxonomic scope. The main object of this study is the order Orthoptera. Orders, related to Orthoptera, distributed in Vrachanska Planina, are Blattodea, Mantodea and Dermaptera. Of the three orders, only one species of Blattodea is published from the investigated area and there is a record of Mantodea in the newly collected material. This scanty information is also included in the present paper.

History of exploration. Vrachanska Planina is well studied with respect to the Orthoptera. This is due to the field studies carried during three periods with considerable distances of time between them.

The beginning is initiated by Nikola Nedelkov who collected insects from the region 110 years ago. He recorded 33 species (Nedelkov 1908), some of them incorrectly identified.

All species are reported from Vratsa but the presence of mountain species among them, such as *Pseudopodisma fieberi* and *Psophus stridulus*, indicates that most were collected in Vrachanska Planina above Vratsa. The prominent orthopterist Boris Uvarov has identified 4 species collected by Finnish entomologists during a one-day excursion above Vratsa (Uvarov 1949). In a review of Orthoptera in Bulgaria, Buresch & Peschev (1955, 1957, 1958) revised the collection of N. Nedelkov correcting some of his identifications and using additional material added four more species: *Roeseliana roeselii*, *Pholidoptera littoralis*, *Pezotettix giornae* and *Aiolopus thalassinus*.

The second crucial landmark in the study of Orthoptera in the explored area, 50 years after N. Nedelkov, was realized by Georgi Peshev. In the frame of expeditions organized by the Institute of Zoology in Western Stara Planina Range, he reported 24 species from Vrachanska Planina (Peschev 1970, Pešev 1974), in most cases without exact indication of the localities.

The present-day period of study of the mountain began other 50 years after the investigations of G. Peshev realized during the last years by the second author. Chobanov (2009a) dealt with some difficult for distinguishing species and corrected some erroneous identifications for seven species in Vrachanska Planina and in his PhD thesis (Chobanov 2009b) he included unpublished specimens from museum collections and revised all published records from which material was preserved. In 2012-2014, he collected new material in Vrachanska Planina from exactly localized places. The following new species and subspecies, most of them valid, were described from Vrachanska Planina respectively by Peshev (1985), Andreeva (1985), Vedenina & Helversen (2009) and Chobanov *et al.* (2014): *Isophya miksici*, *Ephippiger ephippiger balkanicus* (synonymized here), *Chorthippus oschei pusztaensis* and *Tettigonia balcanica*. Revisions of species complexes based on morphological, acoustical, karyological and molecular investigations defined more precisely species and their systematic position in the genera *Isophya* (Grzywacz & Warchałowska-Śliwa 2008, Warchałowska-Śliwa *et al.* 2008, Grzywacz-Gibała *et al.* 2010, Grzywacz *et al.* 2011, Chobanov *et al.* 2013) and *Psorodonotus* (Kaya *et al.* 2015). Scanty information on occurrence of single species in the area of investigation was reported by Pešev (1959), Peschev (1971) and Berger *et al.* (2010). The only species of orders related to Orthoptera from Vrachanska Planina was reported by Drenski (1939). It is an incorrectly identified representative of Blattodea. So far, information on Orthoptera and Blattodea in Vrachanska Planina (the adjacent closely located areas including) was published in 22 papers.

Material and methods

The information on the species distribution is based on the entire literature for Vrachanska Planina and on original data. The original data consist of verification of all published specimens preserved in museum collections, identification of most unpublished specimens from the investigated area and of material collected by the second author. The collection of the National Museum of Natural History in Sofia from Vrachanska Planina comprises the samples of Nikola Nedelkov and Georgi Peshev. A certain part of the specimens collected by the latter author were not published and identified. This refers mainly to common and widely distributed species. All other specimens of Orthoptera, collected before the 1950s, identified and reported in the review of Bulgarian species by Buresch & Peschev (1955, 1957, 1958) are also kept in the same collection. All these

materials comprise incorrectly identified specimens which are revised and a considerable part of them is identified for the first time. The specimens from Vrachanska Planina kept in the collections of the Faculty of Biology of St. Kliment Ohridski University of Sofia, the Natural History Department of the Regional History Museum in Blagoevgrad and the private collection of the second author are also identified or revised. The published material comprises specimens preserved in the Zoological Museum of the University of Helsinki and the private collections of Varvara Vedenina (Moscow) and Dirk Berger (Dresden).

Published records from the investigated area are critically treated, the respective specimens are checked and in certain cases the identifications are corrected. With regard to this, taxonomic changes for some species are mentioned. Attention is paid to endemic and subendemic taxa and to the position of Vrachanska Planina according to the range limits of some species.

The range of each species is presented concisely by the chorotype to which it belongs. The chorotypes in the scheme of Popov (2007) are used. They are modified for some species and some new categories are created considering the current knowledge on the species distribution. For polytypic species, the chorotype is presented separately for species and subspecies. This information is used in an analysis of the chorology of the taxa only on species level. A similar analysis is made also for the origin of the species according to their centres of dispersion after Popov (2007). The concrete categories in this respect however are not mentioned in the text for each species and are used only for a general conclusion. Distribution in Bulgaria is also given in summarized form with indication of the vertical scope of occurrence in the whole country.

Study area. Vrachanska Planina is located in Western Stara Planina Range. It borders with Koznitsa, Golema Planina and Rzhana mountains and Gola Glava Hill. Its border with the Danubian Plain is clearly outlined between the steep slopes and the lowland. The borders of Vrachanska Planina follow the roads around the mountain along the line Vratsa – the main road southwest of Nefela – the same road southwest of Beli Izvor – road fork near the northernmost point of the mountain – road fork to Glavatsi – road fork to Cherkaski – Stoyanovo – road fork to Dolno Ozirovo – road fork to Varshets – Dolna Bela Rechka – Gorna Bela Rechka – Milanovo – the main road along the Iskar Gorge – Opletnya – Eliseina – Zverino – Cherepish – Lyutibrod – Chelopek – Pavolche – Vratsa.

Enlisting the localities of a species, we include also those in the neighbourhood of Vrachanska Planina but they are given separately from the other localities. Localities at the border are Lakatnik Railway Station and Troposhansko place near Vratsa. Beyond the borders of the mountain, only localities at a distance up to 5 km are included: Varshets, Zanozhene, Druzhevo, Rebarkovo, Mezdra and along Dabnik River. The farther situated localities, such as Zanoge in Ponor Mts. and Todorini Kukli Peak and Klisura Monastery in Koznitsa Mts. are not included in the area of investigation. When a certain species is found only out of the mountain borders, the respective text about it is presented with smaller font size. Records of some species collected in Iskar Gorge are commented. *Tetrix bolivari* Saulcy, 1901, specimens from which are labelled and published from Iskar Gorge without exact locality and were not found somewhere else into Vrachanska Planina, is not included in the present paper.

Species published under “Stara Planina” by Nedelkov (1908) are not taken into consideration because they do not concern only Vrachanska Planina above Vratsa but also Svoge and other parts of the mountain that are not located in the explored area. Many

species mentioned by Peschev (1970) for "Western Stara Planina" in general, which were collected in its entire territory, including Vrachanska Planina, are also excluded from the present study.

Abbreviations. The abbreviations used in this paper are:
coll. – collection of
DCh – Dragan Chobanov
GP – Georgi Peshev
leg. – collected by
NMNH – National Museum of Natural History, Sofia
NN – Nikola Nedelkov
obs. – observed
SU – St. Kliment Ohridski University of Sofia

List of species

O R T H O P T E R A

T E T T I G O N I O I D E A

TETTIGONIIDAE

TETTIGONIINAE

D e c t i c i n i

***Decticus verrucivorus verrucivorus* (Linnaeus, 1758)**

Near Parshevitsa Chalet, GN08, N 43°09′, E 23°28′, 1325-1470 m, mesophytic clearings with excessive pasture and isolated overgrown areas, 18.9.2012, adults; N 43°08′, E 23°28′, 1450 m, stony area at the rocky cliff overgrown with grass, 18.9.2012, adults, both DCh obs. Between Vratsa and Parshevitsa Chalet, GN08, N 43°10′, E 23°29′, 1000-1100 m, mesophytic clearing on carbonate stony substrate, 13.7.2014, adults, DCh obs. Beyond the borders of Vrachanska Planina but very close to it, this species is found near Varshets, FN88, 15.7.2000, 1 ♀, leg. Dimov, coll. SU.

Both the species and the nominate subspecies are taxa with Palearctic chorotype. This is a common species in lowlands and mountains in Bulgaria up to 1800 m altitude.

P l a t y c l e i d i n i

***Platycleis grisea* (Fabricius, 1781)**

Near Parshevitsa Chalet, GN08, N 43°08′, E 23°28′, 1450 m, stony area at the rocky cliff overgrown with grass, 18.9.2012, adults, DCh obs. Between Okolchitsa place and Vola place, GN08, N 43°11′, E 23°33′, 970 m, ruderal stony pasture, 19.9.2012, adults, DCh obs. Above Vratsa, GN08, 980 m, 15.9.1964, 1 ♀, leg. GP, coll. NMNH. Close to Vrachanska Planina but beyond its borders, this species is found near Varshets, FN88, 29.6.2000, 1 ♀, leg. Georgiev, coll. SU. An incompletely labelled specimen is collected in Iskar Gorge, 18.8.1966, 1 ♀, leg. GP, coll. NMNH. In the lower part of the gorge where the border of Vrachanska Planina runs, there are suitable habitats for *Platycleis grisea* and the abovementioned female was presumably found in the part of Iskar Gorge adjacent to Vrachanska Planina.

On the basis of bioacoustic investigations, Heller (1988) downgrades the status of *Platycleis grisea* to a subspecies of *Platycleis albopunctata* (Goeze, 1778). According to morphological characteristics, it is restored again as a distinct species by Massa & Fontana (2011).

Platycleis grisea is a Southeastern European species. It is common throughout Bulgaria up to 1500 m a.s.l.

***Tessellana veyseli* Koçak, 1984**

Platycleis vittata Charp.: Nedelkov 1908: 433.
Tessellana vittata Charp.: Buresch & Peschev 1958: 51.
Platycleis (*Tessellana*) *veyseli* Koçak, 1984: Chobanov 2009a: 14, Fig. 8.

Vratsa (Nedelkov 1908); 1 ♀, leg. NN, coll. NMNH (Buresch & Peschev 1958); GN08, 19.8.1907, 1 ♀, leg. NN, coll. NMNH (Chobanov 2009a).

Tessellana was regarded until recently as a subgenus belonging to *Platycleis*. In their new systematics of tribe Platycleidini, Massa & Fontana (2011) considered it as a distinct genus.

This is a European–Western Asiatic species. It occurs in the lower plains and kettles of Bulgaria except its southeastern corner.

***Broughtonia* cf. *domogledi* Brunner von Wattenwyl, 1882**

Platycleis domogledi Brunn. W.: Nedelkov 1908: 433.
Bicolorana arnoldi Buresch & Peschev 1958: 54 (nec Ramme, 1933).
Bicolorana n. sp.: Peschev 1970: 196.
Metrioptera domogledi (Br.): Pešev 1974: 74.

Parshevitsa Chalet, 1300 m, 14-15.9.1964, 2 ♂♂, 5 ♀♀ (Peschev 1970); GN08, 1200 m, 14.9.1964, 1 ♀, 1400 m, 15.9.1964, 1 ♀, both leg. GP, coll. NMNH. Near Parshevitsa Chalet, GN08, N 43°08′, E 23°28′, 1450 m, stony area at the rocky cliff overgrown with grass, 18.9.2012, adults, DCh obs. Between Vratsa and Parshevitsa Chalet, GN08, N 43°10′, E 23°29′, 1000-1100 m, mesophytic clearing on carbonate stony substrate, 13.7.2014, adults, DCh obs. Vrachanska Planina, July 1905, 1 ♂, leg. NN (Buresch & Peschev 1958); 1000 m, 17-18.8.1966, 13 ♂♂, 13 ♀♀ (Peschev 1970); 960-1400 m, 6.8.1957, 14-15.9.1964, 17.8.1966, 11 ♂♂, 20 ♀♀ (Pešev 1974); 1100 m, 17.8.1966, 3 ♂♂, 2 ♀♀, 1300 m, 18,8.1966, 3 ♂♂, 2 ♀♀, both leg. GP, coll. NMNH. Vratsa (Nedelkov 1908); 6.8.1957, 1 ♂, 4 ♀♀, 15.9.1964, 2 ♂♂, 2 ♀♀ (Peschev 1970); GN08, July, 1 ♂, leg. NN, coll. NMNH; 6.8.1957, 1 ♂, leg. GP, coll. NMNH.

A closely related species, *Metrioptera arnoldi* Ramme, 1933, is described from Pirin Mts. Heller (1988) synonymized it with *Metrioptera domogledi* but after other authors it is a subspecies of *Metrioptera domogledi*. For these two species, Harz (1969) described the new subgenus *Broughtonia* belonging to *Metrioptera*. In the new systematics of tribe Platycleidini, Massa & Fontana (2011) considered *Broughtonia* (with the same two species) as a distinct genus. In the same time, however, the latter authors consider three closely related species, *Metrioptera tsirojanni* Harz & Pfau, 1983, *Vichetia oblongicollis* (Brunner von Wattenwyl, 1882) and *Vichetia knipperi* (Ramme, 1951), in other two genera. On the other hand, *Vichetia helleri* (Schmidt, 1998), closely related to *Bicolorana bicolor* (Philippi, 1830), is placed in *Vichetia*, too. Therefore, the generic status of these taxa and the whole group formerly considered within *Metrioptera* (e.g., Harz 1969, Heller 1988) needs revision. The specimens from Vrachanska Planina are similar to *Broughtonia arnoldi* as well as

to *Broughtonia domogledi*. Their species belonging can be clarified definitely only after bioacoustic investigation of their songs.

This species (under this taxonomic interpretation) belongs to the Carpathian–Northern Balkan chorotype. Under the same interpretation, *Broughtonia domogledi* has restricted distribution: in Bulgaria only in Western Stara Planina Range up to 1400 m altitude and beyond its border in the neighbouring countries in the north and in the west. Vrachanska Planina traces out the northern limit of the range.

***Roeseliana roeselii* (Hagenbach, 1822)**

Roeseliana roeselii Hgb.: Buresch & Peschev 1958: 55.
Metrioptera roeseli (Hgb.): Pešev 1974: 73.

Vratsa, leg. NN, coll. NMNH (Buresch & Peschev 1958); 370 m, 18.6.1958, 7 ♂♂, 3 ♀♀ (Pešev 1974); GN08, 23.6.1964, 2 ♂♂, 2 ♀♀, leg. GP, coll. NMNH. Beyond the borders of Vrachanska Planina but very close to it, this species is found near Varshets, FN88, 29.6.2000, 1 ♀, leg. Petkova, 15.7.2000, 1 ♀, leg. Velichkova, both coll. SU.

As in the case of *Broughtonia domogledi*, taxonomic changes during last years were applied also to this taxon. Though Harz (1969) considered six distinct species within the genus *Roeseliana* in Europe, Götz (1969) treated all formerly described South European and Western Asian taxa relative to *Metrioptera roeselii* [*M. fedtschenkoi* (Saussure, 1874), *M. pylnovi* Uvarov, 1924, *M. vasilii* Götz, 1969, *M. ambitiosa* Uvarov, 1924, *M. minor* (Nadig, 1961), *M. azami* (Finot, 1892), *M. brunneri* (Ramme, 1951)] as a single species, *Metrioptera fedtshenkoi*, and pointed to hybridization with *Metrioptera roeselii* in the bordering area of both species ranges. Heller (1988) included all mentioned taxa into a single species, *Metrioptera roeseli*. Later on, Heller *et al.* (1998) doubted the unification of these taxa under one species stating that "while the South European forms formerly included in *Metrioptera fedtschenkoi* clearly belong to *Metrioptera roeseli*, this may not be true for all of the South East European and especially the Caucasian and Central Asian forms." Massa and Fontana (2011) have made a controversial attempt to revise the Palaearctic Platycleidini (the groups related to *Platycleis* and *Metrioptera*) and reestablished the genus *Roeseliana* with seven species. However, they omitted some of the taxa described in this group, which combined with the different understanding of the internal taxonomy of "*Roeseliana*" by different authors resulted in some additional questions like the position of *Roeseliana fedtschenkoi minor* described under *Roeseliana azami*. Chobanov (2011) considered the Bulgarian populations of the group belonging to *Metrioptera roeselii roeselii* in the mountains and *Metrioptera roeselii fedtschenkoi* in the lowlands with transitional forms occurring between these two taxa. Thus, until the situation is resolved and refraining from making a temporary decision, herewith we use the name *Roeseliana roeselii* in a broad sense.

Accepting this interpretation, *Roeseliana roeselii* is a Holarctic species. By the same interpretation, it is distributed in Bulgaria in wetlands up to 1200 m a.s.l.

***Psorodonotus fieberi* (Fieber, 1853)**

Psorodonotus fieberi (Frivaldszky in Fieber, 1853): Kaya, Chobanov, Skejo, Heller & Çıplak 2015: Fig. 2A(1), Fig. 10, Appendix 1, Appendix 2.

Parshevitsa Chalet, GN08, N 43°08′, E 23°28′, 1350-1450 m, 18.9.2012, 1 ♂, leg. DCh, coll. DCh (Kaya *et al.* 2015); the same data, mesophytic clearings with excessive pasture and isolated overgrown areas, DCh obs.

Until recently, the populations of the genus *Psorodonotus* in the Balkan Peninsula

(the only ones in Europe) was considered belonging to three subspecies of *Psorodonotus fieberi*. The new investigations of Kaya *et al.* (2015) proved definitely on the basis of morphological (qualitative and quantitative), acoustic and molecular data that the three taxa are distinct species.

This is a Balkan endemic species with an Eastern Balkan chorotype. It is a common species which occurs only in the higher parts of the mountains usually between 1400 and 2200 m altitude. Vrachanska Planina traces out the northern limit of the range of *Psorodonotus fieberi*.

***Pachytrachis gracilis* (Brunner von Wattenwyl, 1861)**

Pachytrachelus frater Nedelkov 1908: 431 (nec Brunner von Wattenwyl, 1882).
Pachytrachelus gracilis Brunn. W.: Nedelkov 1908: 431.
Pachytrachis frater Buresch & Peschev 1958: 67 (nec Brunner von Wattenwyl, 1882).
Pachytrachis gracilis Br. W.: Buresch & Peschev 1958: 67; Chobanov 2009a: 23.

Near Parshevitsa Chalet, GN08, N 43°08′, E 23°28′, 1450 m, stony area at the rocky cliff overgrown with grass, 18.9.2012, adults, DCh obs. Between Eliseina and Parshevitsa Chalet, GN07, N 43°07′, E 23°30′, 700 m, mesomorphic riparian habitat, 20.9.2012, adults, DCh obs. Between Okolchitsa place and Vola place, GN08, N 43°10′, E 23°34′, 1055 m, mesophytic wood clearings, 19.9.2012, adults, DCh obs. Above Vratsa, GN08, 1300 m, 6.8.1957, 5 ♂♂, 1 ♀, 1 female last instar nymph, leg. GP, coll. NMNH. Vratsa (Nedelkov 1908); July (Buresch & Peschev 1958); July, 1 female last instar nymph, leg. NN (Chobanov 2009a); GN08, the same data, det. NN as *Poecilimon thessalicus* Brunn., coll. NMNH. Close to Vrachanska Planina but beyond its borders, this species is found near Varshets, FN88, 16.7.2000, 1 ♂, coll. SU.

A part of the published material from Vratsa was identified as *Pachytrachelus* (or *Pachytrachis*) *frater* (Brunner von Wattenwyl, 1882); the rest, as *Pachytrachelus* (or *Pachytrachis*) *gracilis* by Nedelkov (1908) and Buresch & Peschev (1958). Checking all the specimens identified and published as *Pachytrachis frater*, Chobanov (2009a) proved that this species does not occur in Bulgaria and is distributed in the northwestern coastal parts of the Balkan Peninsula.

Pachytrachis gracilis is Central and South European species. It is common in Bulgaria in the lowland and hilly belt as well as in the foothills of mountains up to 1500 m a.s.l.

***Rhacocleis germanica* (Herrich-Schäffer, 1840)**

Rhacocleis germanica Herr.-Schäff.: Nedelkov 1908: 431; Buresch & Peschev 1958: 45.

Vratsa (Nedelkov, 1908); August, 1 ♀, leg. NN, coll. NMNH (Buresch & Peschev 1958). Zverino, GN07, N 43°05′, E 23°33′, 500 m, ruderal stony habitat with young trees of *Carpinus*, 19.9.2012, adults, DCh obs.

This is a Central and South European species. *Rhacocleis germanica* is common in lowlands and lower parts of the mountains up to 1200 m altitude, mainly in South Bulgaria.

P h o l i d o p t e r i n i

***Pholidoptera griseoaptera* (De Geer, 1773)**

Above Vratsa, GN08, 860 m, 15.9.1964, 1 ♂, leg. GP, coll. NMNH. Vratsa, GN08, 6.8.1957, 1 ♂, leg. GP, coll. NMNH.

Pholidoptera griseoaptera is a European species distributed also in Northern Anatolia. It is not very common in the lowlands and mountains throughout Bulgaria up to 1600 m

a.s.l.

***Pholidoptera fallax* (Fischer, 1853)**

Olynthoscelis fallax Fisch. Fr.: Nedelkov 1908: 431.
Pholidoptera fallax Fisch.: Uvarov 1949: 91; Buresch & Peschev 1958: 59.

Near Parshevitsa Chalet, GN08, N 43°08′, E 23°28′, 1450 m, stony area at the rocky cliff overgrown with grass, 18.9.2012, adults, DCh obs. Between Eliseina and Parshevitsa Chalet, GN07, N 43°08′, E 23°30′, 1345 m, stony slope surrounded by mesoxerophytic herbaceous vegetation above a forest of *Fagus sylvatica* and below the rocky cliff, 20.9.2012, adults; N 43°07′, E 23°30′, 700 m, mesomorphic riparian habitat, 20.9.2012, adults, both DCh obs. Between Vratsa and Parshevitsa Chalet, GN08, N 43°10′, E 23°29′, 1000-1100 m, mesophytic clearing on carbonate stony substrate, 13.7.2014, adults, DCh obs. Between Okolchitsa place and Vola place, GN08, N 43°10′, E 23°34′, 1055 m, mesophytic wood clearings, 19.9.2012, adults, DCh obs. Above Vratsa, GN08, 980 m, 15.9.1964, 4 ♂♂, 2 ♀♀, 1300 m, 6.8.1957, 1 ♀, both leg. GP, coll. NMNH. Vrachanska Planina, 1100 m, 17.8.1966, 6 ♀♀, 1300 m, 18.8.1966, 1 ♂, 4 ♀♀, both leg. GP, coll. NMNH. Vratsa (Nedelkov 1908); 14.8.[1939], 1 specimen, [leg. Harald Lindberg, Håkan Lindberg, P. Lindberg, coll. Zoological Museum of the University of Helsinki] (Uvarov 1949; Buresch & Peschev 1958 as Vrachanska Planina, 14.8.1949 [instead of 1939]); GN08, 6.8.1957, 2 ♂♂, 8 ♀♀, leg. GP, coll. NMNH. Beyond the borders of Vrachanska Planina but very close to it, this species is found near Varshets, FN88, 16.7.2000, 1 ♂, leg. Petrova, coll. SU.

This is a Central and South European species, widely distributed in Bulgaria up to 1700 m altitude excepting the hottest southwestern parts of the country.

***Pholidoptera aptera karnyi* Ebner, 1908**

Pholidoptera aptera (F.): Peschev 1970: 175-177.

The ridge of Vrachanska Planina (Peschev 1970).

Pholidoptera aptera (Fabricius, 1793) is Central and South European species. Two subspecies of it and transitional forms between them occur in Bulgaria. *Pholidoptera aptera karnyi* is a mountain Balkan endemic subspecies with Northern and Central Balkan chorotype inhabiting Stara Planina, Ruy Mt. and Vitosha Mts. between 800 and 2200 m a.s.l. Vrachanska Planina traces out the northern limit of the range of the subspecies.

***Pholidoptera frivaldskyi* (Herman, 1871)**

Olynthoscelis frivaldskyi Herm.: Nedelkov 1908: 431.
Pholidoptera frivaldskyi Herm.: Buresch & Peschev 1958: 64.
Pholidoptera frivaldskyi (Fieber [sic!]): Pešev 1974: 72.

Parshevitsa Chalet, GN08, 1400 m, 15.9.1964, 2 ♂♂, leg. GP, coll. NMNH. Near Parshevitsa Chalet, GN08, N 43°09′, E 23°28′, 1325-1470 m, mesophytic clearings with excessive pasture and isolated overgrown areas, 18.9.2012, adults, DCh obs. Vrachanska Planina, 1300 m, 18.8.1966, 6 ♂♂, leg. GP, coll. NMNH. Above Vratsa, 16.7.1905, 1 ♂, leg. NN, coll. NMNH (Buresch & Peschev 1958). Vratsa (Nedelkov 1908); 375 m, 28.6.1964 (Pešev 1974); GN08, 23.6.1964, 7 ♂♂, 3 ♀♀, leg. GP, coll. NMNH. At the border of Vrachanska Planina, this species is found in Troposhansko place between Bistrets and Beli Izvor, southwest of Nefela, along Leva River, GN09, [N 43°14′30″, E 23°29′30″], 8.8.1906, 1 ♀, leg. NN, coll. NMNH. Close to Vrachanska Planina but beyond its borders, it is collected near Varshets, FN88, 19.6.1958, 1 ♂, 22.6.1964, 2 ♀♀, both leg. GP, coll. NMNH, 29.6.2000,

1 ♀, leg. Petkova, coll. SU.

Pholidoptera frivaldskyi is a Southeastern European species occurring in mountains. It is known from Stara Planina Range, the mountains of Southwestern Bulgaria and Sakar Mts. between 300 and 2200 m altitude. Vratsa is one of the lowest localities in Bulgaria.

***Pholidoptera littoralis* (Fieber, 1853)**

Pholidoptera litoralis [sic] Fieb.: Buresch & Peschev 1958: 65; Peschev 1970: 197.
Pholidoptera litoralis [sic!] (Fieber, 1953 [sic!]): Pešev 1971: 208; Pešev 1974: 72.

Vratsa, 23.6.1964, 2 ♂♂ (Peschev 1970; Pešev 1971); 23.6.1961 (Pešev 1974); GN08, 23.6.1964, 3 ♀♀, leg. GP, coll. NMNH. In the lowland, in the close proximity of the mountain, *Pholidoptera littoralis* is found along Dabnik River near Vratsa (published as Vratsa, Buresch & Peschev 1958), GN09, 15.8.1949, 1 ♀, leg. S. Minkova, coll. NMNH.

Three subspecies of this species are known. According to Harz (1969), *Pholidoptera littoralis similis* (Brunner von Wattenwyl, 1861) occurs in Bulgaria (Vidin, Stara Planina Range, Rila Mts.). Harz wrote however that he has not investigated the three subspecies and think that only after such study it will be clarified whether the populations in Bulgaria belong to the nominate subspecies or to *Pholidoptera littoralis similis*, to which subspecies he had placed them (Harz 1969). After Eades *et al.* (2015) the nominate form *Pholidoptera littoralis littoralis* is distributed in Bulgaria. Because of the minor differences between the subspecies and lack of comparative material from different parts of the species range, we refrain from determining the subspecies affiliation of the population from Vrachanska Planina.

Treated only as species, *Pholidoptera littoralis* has a South European chorotype. Its distribution in Bulgaria is limited only in Northwestern Bulgaria where it occurs in the western part of the Danubian Plain as well as in Western Stara Planina Range up to 1600 m a.s.l. Contrary to the opinion of Harz (1969) after Nedelkov (1908), the species does not occur in Rila Mts.

***Eupholidoptera schmidti* (Fieber, 1861)**

Vratsata place above Zgorigrad, GN08, N 43°12′, E 23°30′, 860 m, trees and grass vegetation on rocky terrain, 18.9.2012, adults, DCh obs.

Until recently, *Eupholidoptera schmidti* was considered as a subspecies of *Eupholidoptera chabrieri* (Charpentier, 1825) but according to a molecular analysis of a group of closely related taxa it is treated as distinct species (Allegrucci *et al.* 2014).

Eupholidoptera schmidti is a Balkan subendemic species, which range is extended to the northeastern part of Italy. According to chorotype, it is a Transadriatic species. In Bulgaria, the occurrence of this species is restricted to the west of the line Pleven – Ribaritsa – Konyavska Planina Mts. – Blagoevgrad – Mesta Valley and in vertical direction – up to 1200 m altitude. Vrachanska Planina traces out the northern limit of its range.

T e t t i g o n i i n i

***Tettigonia viridissima* (Linnaeus, 1758)**

Between Vratsa and Parshevitsa Chalet, GN08, N 43°10′, E 23°29′, 1000-1100 m, mesophytic clearing on carbonate stony substrate, 13.7.2014, adults, DCh obs. Vratsa, GN08, 6.7.1906, 1 ♂, leg. NN, 6.8.1957, 2 ♂♂, 1 ♀, leg. GP, both coll. NMNH.

This is a Palearctic species. It is common in Bulgaria and occurs in lowlands as well as in mountains up to 2000 m a.s.l.

***Tettigonia balcanica* Chobanov & Lemonnier-Darcemont, 2014**

Tettigonia cantans Pešev 1974: 71 (nec Füssly, 1775).

Tettigonia balcanica Chobanov & Lemonnier-Darcemont 2014 [sp. n.]: Chobanov, Lemonnier-Darcemont, Darcemont, Puskás & Heller 2014: 96, fig. 7.

Vrachanska Planina, above 1000 m, 6.8.1957 (Pešev 1974). Above Vratsa, GN08, 1300 m, 6.8.1957, 11 ♂♂, 1 ♀, coll. NMNH, 2 ♂♂, 1 ♀, coll. Historical Museum Blagoevgrad, both leg. GP (Chobanov *et al.* 2014). All checked specimens (13 ♂♂ and 2 ♀♀) are designated as paratypes.

The species of the genus *Tettigonia*, occurring on the Balkan Peninsula only in the mountains, was found to be an undescribed species. Its populations have been well known during more than a century but have been treated incorrect as belonging to *Tettigonia cantans* (Füssly, 1775), a Eurosiberian species.

Tettigonia balcanica is an endemic taxon for the central part of the Balkan Peninsula known from Southern Croatia, Southeastern Bosnia and Herzegovina, Montenegro, Albania, Northwestern Greece, Macedonia, Southern Serbia and Bulgaria eastwards to Eastern Stara Planina Range. It belongs to Northern and Central Balkan chorotype. In Bulgaria, this species occurs between 700 and 1800 m altitude in Stara Planina Range, Vitosha Mts., Rila Mts., Pirin Mts. and Western Rhodopes (Chobanov *et al.* 2014). Vrachanska Planina traces out the northern limit of its range.

SAGINAE

S a g i n i

***Saga pedo* (Pallas, 1771)**

Saga natoliae Peschev 1970: 197 (nec Serville, 1839); Pešev 1974: 75 (nec Serville, 1839).

Between Vratsa and Parshevitsa Chalet, GN08, N 43°10′, E 23°29′, 1000-1100 m, mesophytic clearing on carbonate stony substrate, 13.7.2014, 1 nymph, DCh obs. Near Cherepish, 18.8.1966, 1 ♀ (Peschev 1970; Pešev 1974). Cherepish Monastery, GN17, 800 m, 8-9.10.1996, 1 ♀, leg. M. Langourov.

The female published by Peschev as *Saga natoliae* is not found in coll. NMNH. Notwithstanding the significant morphological differences between *Saga natoliae* and *Saga pedo*, we consider this specimen belonging to *Saga pedo* because the latter was collected later in the same locality. *Saga natoliae* is a strictly stationary Pontomediterranean faunal element and such species usually do not occur in the Iskar Gorge.

Saga pedo is a European–Western Asiatic species by chorotype. It is one of the few typical steppe species in Bulgaria and occurs in the eastern part of the Danubian Plain and in Dobrudzha, along Stara Planina Range and in several isolated relict localities in Pirin Mts. and Slavyanka Mts. up to 1700 m a.s.l. Its range in Bulgaria has decreased considerably during the last century and in the Danubian Plain it is almost extinct. In contrast to all other species of *Saga*, a peculiarity of this species is the obligatory parthenogenetic development and the absence of males.

BRADYPORINAE

E p h i p p i g e r i n i

***Ephippiger ephippiger ephippiger* (Fiebig, 1784)**

Ephippiger ephippiger balkanicus Andreeva, **syn. n.**: Andreeva 1985: 19, fig. 5 (6) [subsp. n.].

Parshevitsa, 1200 m, 14.9.1964, 7 ♂♂ paratypes (Andreeva 1985); Parshevitsa

Chalet, GN08, 1200 m, 14.9.1964, 1 ♂ paratype, leg. GP, det. E. Andreeva as *Ephippiger ephippiger balkanicus*, coll. Historical Museum Blagoevgrad. Near Parshevitsa Chalet, GN08, N 43°09′, E 23°28′, 1325-1470 m, mesophytic clearings with excessive pasture and isolated overgrown areas, 18.9.2012, adults, DCh obs. Between Vratsa and Parshevitsa Chalet, GN08, N 43°10′, E 23°29′, 1000-1100 m, mesophytic clearing on carbonate stony substrate, 13.7.2014, nymphs, DCh obs. Between Okolchitsa place and Vola place, GN08, N 43°10′, E 23°34′, 1055 m, mesophytic wood clearings, 19.9.2012, adults; N 43°11′, E 23°33′, 970 m, ruderal stony pasture, 19.9.2012, adults, both DCh obs. Vratsa, GN08, 6.7.1906, 1 ♀, leg. NN, 18.7.1950, 2 ♀♀, leg. S. Minkova, 6.8.1957, 1 ♂, leg. GP, all coll. NMNH. At the border of Vrachanska Planina, this species is found in Troposhansko place between Bistrets and Beli Izvor, southwest of Nefela, along Leva River, GN09, [N 43°14′30″, E 23°29′30″], 8.8.1906, 1 ♂, leg. NN, coll. NMNH. Close to Vrachanska Planina but beyond its borders, it is collected near Varshets, FN88, 14.7.2000, 1 ♂, leg. Tsvetanov, coll. SU.

According to Andreeva (1985), 7 ♂♂ paratypes of *Ephippiger ephippiger balkanicus* from Parshevitsa were preserved in the Natural History Department of the Regional History Museum in Blagoevgrad. Now, only one male paratype from this locality exists in the same collection. After revision of the type material of *Ephippiger ephippiger balkanicus* (the paratype from Parshevitsa, the holotype from Belogradchik and other paratypes) and additional material from Northwestern Bulgaria (the range of subsp. *balkanicus*), we did not find stable morphological differences in titillators, epiproct and cerci between this population and the ones from South Bulgaria treated by Andreeva (1985) as *Ephippiger ephippiger ephippiger*. The shape and size of titillators vary widely in one and the same population. Thus, *Ephippiger ephippiger ephippiger* (Fiebig, 1784) (= *Ephippiger ephippiger balkanicus* Andreeva, 1985, **syn. n.**).

Both the species and the nominate subspecies are Central and South European taxa. *Ephippiger ephippiger ephippiger* is a common subspecies in Bulgaria up to 2000 m altitude except for lowlands in its southeastern part.

CONOCEPHALINAE

Copiphorini

***Ruspolia nitidula* (Scopoli, 1786)**

Conocephalus nitidulus Scop.: Nedelkov 1908: 428.
Homorocoryphus nitidulus Scop.: Buresch & Peschev 1958: 40-41.

Vratsa, leg. S. Statkov (Nedelkov 1908; Buresch & Peschev 1958); GN08, July, 1 ♂, leg. NN, coll. NMNH. Beyond the borders of Vrachanska Planina but very close to it, this species is found near Varshets, FN88, 12-17.7.2000, 3 ♂♂, 1 male last instar nymph, coll. SU.

Ruspolia nitidula belongs to the Afrotropical–Palearctic chorotype. It occurs in moist habitats in lowlands and kettles of Bulgaria up to 600 m a.s.l.

Conocephalini

***Conocephalus* (*Conocephalus*) *hastatus hastatus* (Charpentier, 1825)**

Xyphidium hastatum Charp.: Nedelkov 1908: 429.
Conocephalus hastatus Charp.: Buresch & Peschev 1958: 40.

Above Gorno Ozirovo, FN98, N 43°14′, E 23°24′, 370 m, xeromesophytic meadows with shrubs and groves of *Carpinus orientalis*, 17.9.2012, adults, DCh obs. Opletnya, GN07, 500-600 m, groves of *Carpinus orientalis*, 20.9.2012, adults, DCh obs. Vratsa (Nedelkov

1908); July 1907, 1 ♂, 1 ♀, leg. NN (Buresch & Peschev 1958); GN08, July, 1 ♂, leg. NN, coll. NMNH. An incompletely labelled specimen is collected in Iskar Gorge, 18.8.1966, 1 ♂, leg. GP, coll. NMNH. Suitable habitats for this species exists in the lower part of the gorge where the border of Vrachanska Planina runs and the abovementioned male was presumably found in the part of Iskar Gorge adjacent to Vrachanska Planina.

The nominate subspecies is a Balkan subendemic taxon. Its range covers the eastern part of the Balkan Peninsula and extends beyond its borders only in the adjacent parts of South Romania. Therefore, the subspecies is Eastern Balkan by chorotype. *Conocephalus hastatus* as species belongs to Eastern Mediterranean chorotype. It inhabits the lowlands and rarely occurs in the lower parts of the mountains up to 800 m altitude in North and Southeastern Bulgaria.

MECONEMATINAE

M e c o n e m a t i n i

***Meconema thalassinum* (De Geer, 1773)**

Meconema thalassina [sic!] De Geer: Uvarov 1949: 92.
Meconema thalassinum De Geer: Buresch & Peschev 1958: 37.

Vratsa, 14.8.[1939], 1 specimen, [leg. Harald Lindberg, Håkan Lindberg, P. Lindberg, coll. Zoological Museum of the University of Helsinki] (Uvarov 1949); Vrachanska Planina, the same data (Buresch & Peschev 1958).

Meconema thalassinum is a European species. It is common in lowland and mountain deciduous forests up to 1500 m a.s.l. in Bulgaria inhabiting the canopy of trees.

PHANEROPTERIDAE

PHANEROPTERINAE

P h a n e r o p t e r i n i

***Phaneroptera* (*Phaneroptera*) *nana* Fieber, 1853**

Phaneroptera quadripunctata Br. W.: Pešev 1974: 69.

Between Eliseina and Parshevitsa Chalet, GN07, N 43°06′, E 23°30′, 500 m, mesomorphic riparian habitat, 20.9.2012, adults, DCh obs. Vratsa, 6.8.1958 (Pešev 1974); GN08, 6.8.1957, 1 ♂, 1 ♀, leg. GP, coll. NMNH. An incompletely labelled specimen is collected in Iskar Gorge, 18.8.1966 (Pešev 1974); 1 ♂ with the same data, leg. GP, coll. NMNH. In the lower part of the gorge where the border of Vrachanska Planina runs, there are suitable habitats for *Phaneroptera nana* and the abovementioned male was presumably found in the part of Iskar Gorge adjacent to Vrachanska Planina.

This is a Holomediterranean species. It inhabits trees and shrubs in the lowlands and at the feet of the mountains in Bulgaria up to 900 m altitude.

***Phaneroptera* (*Phaneroptera*) *falcata* (Poda, 1761)**

Phaneroptera falcata Scop. [sic!]: Nedelkov 1908: 428.
Phaneroptera falcata Poda: Buresch & Peschev 1958: 9-10.

Vratsa, GN08, August, leg. S. Statkov (Nedelkov 1908); 1 ♀, coll. NMNH (Buresch & Peschev 1958).

Eurosiberian species. It is rare in isolated localities in Stara Planina Range, Western Sredna Gora Mts., Osogovo Mts., Maleshevska Planina Mts., Belasitsa Mts. and Strandzha Mts. up to 1600 m a.s.l.

Tylopsidini

***Tylopsis lilifolia* (Fabricius, 1793)**

Tylopsis thymifolia Petagna: Nedelkov 1908: 428.
Tylopsis lilifolia Fabr.: Buresch & Peschev 1958: 11.

Between Eliseina and Parshevitsa Chalet, GN07, N 43°06′, E 23°30′, 500 m, mesomorphic riparian habitat, 20.9.2012, adults, DCh obs. Zverino, GN07, N 43°05′, E 23°33′, 500 m, ruderal stony habitat with young trees of *Carpinus*, 19.9.2012, adults, DCh obs. Vratsa (Nedelkov 1908); July to August (Buresch & Peschev 1958); GN08, 6.8.1957, 4 ♂♂, 3 ♀♀, 1 female last instar nymph, leg. GP, coll. NMNH. Close to Vrachanska Planina but beyond its borders, this species is found near Varshets, FN88, 12.7.2000, 1 ♂, 1 ♀, leg. Hristova and Stoyanov, coll. SU. An incompletely labelled specimen is collected in Iskar Gorge, 18.8.1966, 1 ♀, leg. GP, coll. NMNH. Such common and widely distributed in Bulgaria species as *Tylopsis lilifolia* undoubtedly occurs also in the part of Iskar Gorge adjacent to Vrachanska Planina.

Holomediterranean species. It is common on shrubs and in herbaceous habitats in lowlands and lower slopes of the mountains in Bulgaria up to 1000 m altitude.

Barbitistini

***Leptophyes albovittata* (Kollar, 1833)**

Leptophyes albovittata Koll.: Nedelkov 1908: 428; Uvarov 1949: 92; Buresch & Peschev 1958: 12; Pešev 1974: 69.

Above Vratsa, 1200 m, 16.6.1964 and 15.9.1964 (Pešev 1974); GN08, 860 m, 15.9.1964, 3 ♂♂, 1 ♀, leg. GP, coll. NMNH. Vratsa (Nedelkov 1908); July to August (Buresch & Peschev 1958); 14.8.[1939], 3 specimens, [leg. Harald Lindberg, Håkan Lindberg, P. Lindberg, coll. Zoological Museum of the University of Helsinki] (Uvarov 1949); GN08, 16.6.1958, 1 ♂, 2 female last instar nymphs, leg. GP, coll. NMNH. At the border of Vrachanska Planina, this species is found in Lakatnik Railway Station, FN97, 20.7.1998, 1 ♀, leg. D. Chobanov, and in Troposhansko place between Bistrets and Beli Izvor, southwest of Nefela, along Leva River, GN09, [N 43°14′30″, E 23°29′30″], 8.8.1906, 4 ♂♂, 1 ♀, leg. NN, both coll. NMNH.

European species. It is common in lowlands and lower parts of the mountains throughout Bulgaria up to 1000 m a.s.l.

***Leptophyes discoidalis* (Frivaldszky, 1867)**

Leptophyes discoidalis Friv.: Pešev 1959: 153.

Vratsata place along Varteshnitsa River, on *Sambucus nigra* L., 16.6.1958, 3 ♂♂, leg. GP (Pešev 1959); GN08, 17.6.1958, 1 ♀, leg. GP, coll. NMNH. Between Okolchitsa place and Vola place, GN08, N 43°10′, E 23°34′, 1055 m, mesophytic wood clearings, 19.9.2012, 1 ♂, leg. DCh.

Leptophyes discoidalis is a Carpathian–Northern Balkan species. It is among the rare species of Orthoptera in Bulgaria. Distributed only in Northwestern Bulgaria, it is known from two other localities in this country: Berkovitsa and Pleven area. The abovementioned localities in Vrachanska Planina are the southernmost ones in the range.

***Isophya rectipennis* Brunner von Wattenwyl, 1878**

Jsophya [sic!] *pyrenaea* Nedelkov 1908: 426 (nec Serville, 1838).
Isophya rectipennis Brunner von Wattenwyl, 1878: Chobanov 2009a: 20; Chobanov, Grzywacz, Iorgu, Cıplak, Ilieva & Warchałowska-Śliwa 2013: 61, Fig. 191.

Vratsa (Nedelkov 1908; Chobanov 2009a); GN08, N 43°11′, E 23°33′, 23.6.1964, 1 ♂, leg. GP, coll. NMNH (Chobanov *et al.* 2013).

Nedelkov reported with uncertainty his material as belonging to *Isophya pyrenaea* and considered *Isophya camptoxypha* Fieb. as its synonym. Buresch & Peschev (1958) treated also with doubt the correctness of the identification of Nedelkov without excluding entirely the occurrence of *Isophya pyrenaea* in Bulgaria. Now, it is already known that *Isophya pyrenaea* and *Isophya camptoxypha* are distinct species, the former not distributed on the Balkan Peninsula and the latter not distributed in the eastern part of the Peninsula (Chobanov *et al.* 2013).

Isophya rectipennis is a Balkan subendemic species which range covers beyond the Balkan Peninsula only Northwestern Anatolia. A Pontian species by chorotype. This species is widely distributed in Bulgaria except in the southwestern regions, occurring mostly in the lowland and hilly belt up to 1200 m altitude.

***Isophya miksici* Peshev, 1985**

Jsophya [sic!] *modesta* Nedelkov 1908: 426 (nec Frivaldszky, 1867).
Jsophya [sic!] *modestior* Nedelkov 1908: 426 (part.) (nec Brunner von Wattenwyl, 1882).
Isophya n.sp.: Peschev 1970: 195-196.
Isophya modestior Pešev 1974: 69 (nec Brunner von Wattenwyl, 1882).
Isophya mikšiči Peshev 1985: 15 (sp.n.).
Isophya miksici Peshev, 1985: Grzywacz & Warchałowska-Śliwa 2008: 154; Warchałowska-Śliwa, Chobanov, Grzywacz & Maryańska-Nadachowska 2008: 230; Grzywacz-Gibała, Chobanov & Warchałowska-Śliwa 2010: 28; Grzywacz, Maryańska-Nadachowska, Chobanov, Karamysheva & Warchałowska-Śliwa 2011: 511; Chobanov, Grzywacz, Iorgu, Cıplak, Ilieva & Warchałowska-Śliwa 2013: 26-27, 40, 66, Fig. 114, 151, 156, 192.

Gorski Dom Vacation House, GN08, N 43°10′, E 23°29′, 1150-1200 m, lush mesophyte meadow, 24.6.2006, adults and nymphs in large numbers observed, 22 ♂♂, 7 ♀♀, 4 male and 4 female last instar nymphs, leg. DCh, coll. DCh (Chobanov *et al.* 2013); the same data, 2 specimens (Grzywacz & Warchałowska-Śliwa 2008, as near Parshevitsa Chalet); 1000-1200 m, 4 ♂♂, 1 ♀ (Warchałowska-Śliwa *et al.* 2008, as near Parshevitsa Chalet); the same data, N 43°10′, E 23°29′ (Grzywacz-Gibala *et al.* 2010, as Vrachanska Planina; Grzywacz *et al.* 2011, as West Stara Planina). Between Vratsa and Parshevitsa Chalet, GN08, N 43°10′, E 23°29′, 1000-1100 m, mesophytic clearing on carbonate stony substrate, 13.7.2014, adults, DCh obs. Vrachanska Planina, N 43°10′, E 23°29′, up to 1200 m, in meadows on the slopes, 16-18.6.1958, 46 ♂♂, 29 ♀♀ [part.] (Peschev 1970; Chobanov *et al.* 2013); N 43°11′, E 23°30′, 840 m, 24.6.1964, 3 ♂♂; N 43°08′, E 23°27′, 1300 m, 18.8.1966, 2 ♀♀, both leg. GP, coll. NMNH (Chobanov *et al.* 2013). Above Vratsa, GN08, N 43°11′, E 23°31′, 600 m, 6.8.1957, 2 ♀♀ paratypes, leg. GP (Pešev 1974, as Vratsa; Peshev 1985); the same date (labelled Vratsa), 1 ♂, 2 ♀♀, leg. GP, coll. NMNH (Chobanov *et al.* 2013); 1100 m, 16-17.6.1958, 14 ♂♂, 13 ♀♀ paratypes, leg. GP (Peshev 1985); 16.6.1958, 1 ♂, 17.6.1958 (17.8.1958), 3 ♂♂, 6 male and 10 female last instar nymphs (labelled Vratsa), both leg. GP, coll. NMNH; N 43°10′, E 23°29′, 1100 m, 23.6.1964, 3 ♂♂, 2 ♀♀ paratypes, leg. GP (Peshev 1985); 5 ♂♂, 5 ♀♀, leg. GP, coll. NMNH (Chobanov *et al.* 2013). Vratsa, the lowland and neighbouring slopes, N 43°11′, E 23°33′ (Nedelkov 1908; Chobanov *et al.* 2013); in meadows in the lowland, 16-18.6.1958, 46 ♂♂, 29 ♀♀ [part.] (Peschev 1970); July, 1 ♂, 2 ♀♀, leg. NN, det. NN as *Isophya modestior*, 6.7.1906, 1 ♂, leg. NN; 18.6.1958, 3 ♂♂, 2 ♀♀, leg. GP, all coll. NMNH (Chobanov *et al.* 2013). Gorski Dom Vacation House is situated in Varovititsa place 2 km north of Parshevitsa Chalet and 4 km southwest of Zgorigrad. Beyond the borders

of Vrachanska Planina but very close to it, this species is found near Zanozhene (suburb of Varshets), FN88, N 43°10′, E 23°14′, up to 700 m, in meadows, 20.6.1958, 4 ♂♂, 7 ♀♀ (Peschev 1970; Pešev 1974; both as Varshets); 20.6.1958, 5 ♂♂, 8 ♀♀; 22.6.1964, 4 ♂♂, 3 ♀♀, both leg. GP, coll. NMNH (Chobanov *et al.* 2013). Buresch & Peschev (1958) consider as dubiously the record of *Isophya modesta* in Vratsa and Vrachanska Planina by Nedelkov.

Isophya miksici is an endemic species which occurs only in Western Stara Planina Range up to 1600 m a.s.l. and the adjacent parts of the Western Danubian Plain with a range reaching Iskar River. Hence, it belongs to the Western Stara Planina chorotype. To the east of Iskar River, it is replaced with *Isophya plevnensis* Peshev, 1985, a vicariant closely related endemic species with a range in the central part of the Danubian Plain and Central Stara Planina Range. The southernmost localities in the range of *Isophya miksici* are the ones in Vrachanska Planina, Zanozhene and above Berkovitsa.

***Isophya* cf. *plevnensis* Peshev, 1985**

Isophya cf. *plevnensis* Peshev, 1985: Chobanov, Grzywacz, Iorgu, Cıplak, Ilieva & Warchałowska-Śliwa 2013: 66, Fig. 192.

Levishte Railway Station, GN07, N 43°05′, E 23°28′, 14.7.2009, 1 ♂, 1 ♀, leg. D. Pilarska, coll. DCh (Chobanov *et al.* 2013).

This locality of *Isophya plevnensis* in Iskar Gorge is situated very close to the range of *Isophya miksici*. The exact border between the populations of the two species is not clear, and the question whether both occur sympatrically and produce hybrids stays.

Isophya plevnensis is another endemic species known from the Central Danubian Plain between Iskar and Yantra rivers as well as from Central Stara Planina Range up to 1200 m altitude and the eastern part of Western Stara Planina. It belongs to the Central Danubian–Central Predbalkan chorotype. Levishte is the westernmost locality in the range of *Isophya plevnensis*. It is situated 51 km far from Etropole, the closest locality of the species.

***Isophya modestior* Brunner von Wattenwyl, 1882**

Jsophya [sic!] *modestior* Nedelkov 1908: 426 (part.).
Isophya modestior Brunner von Wattenwyl, 1882: Chobanov, Grzywacz, Iorgu, Cıplak, Ilieva & Warchałowska-Śliwa 2013: 72, Fig. 194.

Vratsa (Nedelkov 1908); GN08, N 43°11′, E 23°33′, June, 1 ♂, leg. NN, coll. NMNH (Chobanov *et al.* 2013). Close to Vrachanska Planina but beyond its borders, this species is found near Varshets, FN88, N 43°10′, E 23°14′, 20.6.1958 (Pešev 1974); 20.6.1958, 27 ♂♂, 16 ♀♀; 22.6.1964, 4 ♂♂, 2 ♀♀, both leg. GP; 1.7.2000, 1 ♂, leg. P. Angelova; July 2000, 1 ♂, leg. N. Slavov, all. coll. NMNH (Chobanov *et al.* 2013).

A Central and South European species. This species is distributed only in Western Bulgaria in mountains and their foothills between 500 and 1800 m a.s.l. in the south to Osogovo Mts. and Vitosha Mts. Vrachanska Planina traces out the northern limit of the range of *Isophya modestior*.

***Isophya speciosa* (Frivaldszky, 1867)**

Isophya speciosa (Frivaldszky, 1865): Chobanov, Grzywacz, Iorgu, Cıplak, Ilieva & Warchałowska-Śliwa 2013: 75, Fig. 195.

Vrachanska Planina, N 43°11′, E 23°29′, 1000 m, 24.6.1964, 7 ♂♂, 2 ♀♀, leg. GP, coll. NMNH (Chobanov *et al.* 2013). Vratsa, GN08, N 43°11′, E 23°33′, the vineyards, 12.6.1949,

1 ♂, coll. NMNH; 6.8.1957, 1 ♀; 17.6.1958, 4 ♂♂, both leg. GP, coll. NMNH (Chobanov *et al.* 2013).

Isophya speciosa is a Balkan subendemic species which range covers beyond the Balkan Peninsula only South Romania and Northwestern Anatolia. According to its chorotype, it is an Eastern Mediterranean species. This species is very common and widely distributed in Bulgaria up to 2200 m altitude except its southwesternmost corner.

***Ancistrura nigrovittata* (Brunner von Wattenwyl, 1878)**

Barbitistes serricaudus [sic!] Nedelkov 1908: 426 (nec Fabricius, 1794); Buresch & Peschev 1958: 25 (nec Fabricius, 1794).

Ancistrura nigrovittata (Brunner von Wattenwyl, 1878): Chobanov 2009a: 21.

Vratsa, July, 1 abnormal ♂ (Nedelkov 1908; Buresch & Peschev 1958); GN08, July, 1 ♂, leg. NN, det. NN as *Barbitistes serricauda* [sic!], coll. NMNH (Chobanov 2009a).

Nedelkov (1908) reported the only specimen known from this area as *Barbitistes serricaudus* but wrote that the species cannot be identified correctly. He considered the specimen abnormal in respect to the male genitalia. This is due to the incorrect identification of the genus because at that time the genus *Ancistrura* has not been described yet (Chobanov 2009a). Buresch & Peschev (1958) also have doubts about the occurrence of *Barbitistes serricauda* in Bulgaria (Vratsa) putting a question mark before the name of this species.

Eastern Balkan species. It inhabits shrubs in South Bulgaria (usually up to 1200 m a.s.l.) without its southeastern part. Vratsa is the only locality in North Bulgaria. If we accept the opinion of Iorgu *et al.* (2008) that *Ancistrura nigrovittata* is possibly extinct in Romania (Dobrogea), Vratsa is the northernmost locality in the range of the species. The species and the monotypic genus *Ancistrura* are Balkan endemic taxa distributed only in northeastern part of the Balkan Peninsula.

***Poecilimon* (*Poecilimon*) *thoracicus* (Fieber, 1853)**

Poecilimon thoracicus Fieb.: Nedelkov 1908: 425.

Near Parshevitsa Chalet, GN08, N 43°08′, E 23°28′, 1450 m, stony area at the rocky cliff overgrown with grass, 18.9.2012, adults, DCh obs. Between Vratsa and Parshevitsa Chalet, GN08, N 43°10′, E 23°29′, 1000-1100 m, mesophytic clearing on carbonate stony substrate, 13.7.2014, adults, DCh obs. Above Cherepish Monastery, GN17 (Nedelkov 1908). Vratsa (Nedelkov 1908); GN08, 6.8.1957, 1 ♂, 1 ♀, leg. GP, coll. NMNH. At the border of Vrachanska Planina, this species is found in Lakatnik Railway Station, FN97, 7.7.1948, 1 ♂, 2 ♀♀, leg. P. Drenski, coll. NMNH. In the close proximity of the mountain, *Poecilimon thoracicus* is collected along Dabnik River near Vratsa, GN09, 15.8.1949, 1 ♂, coll. NMNH. Close to Vrachanska Planina but beyond its borders, it is found near Varshets, FN88, 19.6.1958, 1 ♀, leg. GP, coll. NMNH.

Poecilimon thoracicus is a Balkan subendemic species, which range is extended to parts of South Romania. It is most likely a Southern Carpathian–Northern and Central Balkan species by chorotype. This very common species is widely distributed in Bulgaria up to 2500 m altitude.

***Poecilimon* (*Poecilimon*) *fussii* Brunner von Wattenwyl, 1878**

Between Vratsa and Parshevitsa Chalet, GN08, N 43°10′, E 23°29′, 1000-1100 m, mesophytic clearing on carbonate stony substrate, 13.7.2014, adults, DCh obs. Vrachanska Planina, 1100 m, 17.8.1966, 2 ♂♂; 1300 m, 18.8.1966, 1 ♂, 1 ♀, both leg. GP and det. GP

as *Poecilimon elegans* Br. W.; coll. NMNH. Vratsa, GN08, 6.7.1906, 1 ♂, 1 ♀, leg. NN, det. GP as *Poecilimon elegans* Br. W.; June, 1 ♂, 1 ♀, leg. NN, det. NN as *Poecilimon thoracicus* Fieb.; 1 ♂, leg. NN, det. NN as *Poecilimon fussi* [sic!] Brunn.; 6.8.1957, 1 ♀ and 23.6.1964, 1 ♂, both leg. GP and det. GP as *Poecilimon elegans* Br. W.; all coll. NMNH. Beyond the borders of Vrachanska Planina but very close to it, this species is found near Varshets, FN88, 20.6.1958, 1 ♂, leg. GP, coll. NMNH.

Poecilimon fussii is a Central and South European species. It occurs in the lowlands and mountains (up to 1500 m a.s.l.) of North Bulgaria excepting its eastern part and in South Bulgaria its range reaches in the south to Osogovo Mts., Rila Mts. and Sredna Gora Range.

***Polysarcus denticauda* (Charpentier, 1825)**

Between Vratsa and Parshevitsa Chalet, GN08, N 43°10′, E 23°29′, 1000-1100 m, mesophytic clearing on carbonate stony substrate, 13.7.2014, adults, DCh obs. Vratsa, GN08, 17.6.1958, 4 ♂♂, leg. GP, coll. NMNH.

Central and South European species. In Bulgaria, this is a mountain species, which is common also in the highest parts of the country but rarely occurs in isolated localities in lowlands and kettles as well. It is not found in Southeastern Bulgaria.

G R Y L L O I D E A

GRYLLIDAE

GRYLLINAE

G r y l l i n i

***Gryllus* (*Gryllus*) *campestris* Linnaeus, 1758**

Near Ledenika Cave, GN08, 1.5.1963, 1 male last instar nymph, leg. D. Marinova, coll. NMNH. Near Parshevitsa Chalet, GN08, N 43°09′, E 23°28′, 1325-1470 m, mesophytic clearings with excessive pasture and isolated overgrown areas, 18.9.2012, nymphs of penultimate instar, DCh obs. Parshevitsa Chalet, GN08, 1200 m, 14.9.1964, 1 nymph, leg. GP, coll. NMNH. Between Okolchitsa place and Vola place, GN08, N 43°11′, E 23°33′, 970 m, ruderal stony pasture, 19.9.2012, nymphs of penultimate instar, DCh obs. Above Vratsa, GN08, 980 m, 15.9.1964, 2 nymphs, leg. GP, coll. NMNH. Vratsa, GN08, 17.6.1958, 1 ♀, leg. GP, coll. NMNH. This species is found 2.5 km beyond the borders of Vrachanska Planina near Druzhevo, FN97, N 43°08′, E 23°21′, 1050 m, xeromesophytic stony meadows with partly ruderalised vegetation, 16.9.2012, 1 nymph, DCh obs.

Gryllus campestris is a Western Palearctic species. This most common species of Grylloidea in Bulgaria is distributed in whole country up to 2200 m a.s.l.

***Melanogryllus desertus* (Pallas, 1771)**

Vratsa, GN08, 23.6.1964, 1 ♂, 1 ♀, leg. GP, coll. NMNH. Close to Vrachanska Planina but beyond its borders, it is collected near Mezdra, GN18, 16.6.1906, 1 ♀, leg. NN, coll. NMNH.

Melanogryllus desertus is a Western Palearctic species. It is distributed in lowlands and foothills of the mountains in Bulgaria up to 1000 m altitude (usually up to 600 m).

M o d i c o g r y l l i n i

***Modicogryllus* (*Modicogryllus*) *truncatus* (Tarbinsky, 1940)**

Vratsa, GN08, 23.6.1964, 4 ♂♂, 1 ♀, leg. GP, coll. NMNH.

The species is reported quite recently for the first time for Bulgaria (Popov 2007). Almost all records of *Modicogryllus* in Bulgaria, referred in the past to *Mogicogryllus frontalis*, belong in fact to *Modicogryllus truncatus* (Chobanov 2011).

Modicogryllus truncatus is a Southeastern European–Western Asian species. It occurs in the lowland and hilly parts of Bulgaria up to 400 m a.s.l.

***Modicogryllus* (*Modicogryllus*) *frontalis* (Fieber, 1844)**

This species is not recorded in Vrachanska Planina but is found only 5 km outside its border in Koznitsa Mts. near Zanozhene (suburb of Varshets), FN88, 22.6.1964, 1 ♀, leg. GP, coll. NMNH.

In the past, it is considered as a common species in Bulgaria but the checking of all collected specimens proved that they belong almost entirely to *Modicogryllus truncatus*. As a result of this revision of material of *Modicogryllus* in Bulgarian collections, *Modicogryllus frontalis* was found to be one of the rarest species of Orthoptera in Bulgaria.

A Eurosiberian species. In Bulgaria, it is known only from abovementioned locality and Berkovitsa. These two localities trace out the southern limit of the range of *Modicogryllus frontalis*.

NEMOBIINAE

P t e r o n e m o b i i n i

***Pteronemobius* (*Pteronemobius*) *heydenii heydenii* (Fischer, 1853)**

Vratsa, GN08, 18.6.1958, 2 ♂♂, 13 ♀♀, leg. GP, coll. NMNH. Beyond the borders of Vrachanska Planina but very close to it, this species is found near Varshets, FN88, 19.6.1958, 1 ♂, 2 ♀♀; 25.5.1966, 4 ♀♀, both leg. GP, coll. NMNH. Two incompletely labelled specimens are collected in Iskar Gorge, 26.5.1966, 2 ♀♀, leg. GP, coll. NMNH. In the lower part of the gorge where the border of Vrachanska Planina runs, there are suitable moist habitats for *Pteronemobius heydenii heydenii* and the abovementioned females were presumably found in the part of Iskar Gorge adjacent to Vrachanska Planina.

Pteronemobius heydenii heydenii belongs to the Central and South European chorotype and *Pteronemobius heydenii* as a species is Paleotropical–Palearctic. In Bulgaria, this species occurs in lowlands and foothills of the mountains up to 650 m altitude.

T R I D A C T Y L O I D E A

TRIDACTYLIDAE

TRIDACTYLINAE

***Xya pfaendleri* (Harz, 1970)**

Close to Vrachanska Planina but beyond its borders, this species is found near Varshets, FN88, 19.6.1958, 1 ♂, 6 ♀♀; 25.5.1966, 1 ♂, 5 ♀♀, both leg. GP, coll. NMNH.

Also beyond the borders of Vrachanska Planina, the genus *Xya* is reported by Nedelkov (1908) from the sands along Iskar River near Rebarkovo and Mezdra observed in July. The record is published as *Tridactylus variegatus* (Latr.). The material of Nedelkov is not preserved in coll. NMNH. During the record of Nedelkov (July 1907 according to Buresch & Peschev 1957) *Xya pfaendleri* has not been described and now it is not possible to clarify which of the two species or both have been found by Nedelkov.

Paleotropical–Palearctic species. *Xya pfaendleri* occurs in lowlands and foothills of the mountains up to 500 m a.s.l. mainly in South Bulgaria.

***Xya variegata* Latreille, 1809**

Altogether with the preceding species, this species is found close to Vrachanska Planina but beyond its borders near Varshets, FN88, 19.6.1958, 1 ♂, 1 ♀; 25.5.1966, 1 ♂, both leg. GP, coll. NMNH.

Tridactylus variegatus (Latr.) is published by Nedelkov (1908) from the sands along Iskar River near Rebarkovo and Mezdra observed in July. The identification of Nedelkov is not sure (see the preceding species). Nevertheless, the samples of Nedelkov very likely have consisted of both species because in most localities and samples in Bulgaria in which *Xya variegata* has been recorded, the more common *Xya pfaendleri* also occurs. So far however, the genus *Xya* and both species are not proved as occurring in Vrachanska Planina but suitable habitats for them exists along Iskar River above Rebarkovo.

Paleotropical–Palearctic species. *Xya variegata* occurs in lowlands and foothills of the mountains up to 600 m a.s.l. mainly in South Bulgaria but is more rare than the preceding species.

T E T R I G O I D E A

TETRIGIDAE

TETRIGINAE

T e t r i g i n i

***Tetrix bipunctata* (Linnaeus, 1758)**

Tetrix bipunctata (L.): Nedelkov 1908: 416 (part.); Buresch & Peschev 1955: 14.

Above Gorna Bela Rechka, FN98, N 43°11′, E 23°23′, 950 m, 17.9.2012, adults, DCh obs. Vratsa (Nedelkov 1908); GN08, June, 1 specimen, leg. NN, coll. NMNH (Buresch & Peschev 1955).

According to Nedelkov (1908) *Tetrix bipunctata* inhabits mountains and occurs rarely in lowlands. The specimen from Vratsa checked by Buresch & Peschev (1955) was not found in coll. NMNH. Therefore, the identification arouses certain doubt and confusion with *Tetrix tenuicornis* is possible. The new record above Gorna Bela Rechka verifies the occurrence of *Tetrix bipunctata* in Vrachanska Planina.

Palearctic species. In Bulgaria, it occurs in the mountains and their foothills from 700 to 1800 m altitude.

***Tetrix tenuicornis* (Sahlberg, 1893)**

Tetrix bipunctata Lin.: Nedelkov 1908: 416 (part.) (nec Linnaeus, 1758).

Vratsa, GN08 (Nedelkov 1908). Beyond the borders of Vrachanska Planina but very close to it, this species is found near Varshets, FN88, 900 m, 25.6.1966 [sic!] (Pešev 1974, as *Tetrix nutans nutans* Hag.), 22.6.1964, 1 ♂, 2 ♀♀; 25.5.1966, 6 ♂♂, 21 ♀♀, 1 male and 4 female last instar nymphs, both leg. GP, coll. NMNH. Three incompletely labelled specimens are collected in Iskar Gorge, 26.5.1966, 3 ♂♂, leg. GP, coll. NMNH. It is possible that these specimens were found in the lower part of the gorge adjacent to Vrachanska Planina.

Palearctic species. *Tetrix tenuicornis* is widely distributed in Bulgaria up to 1400 m a.s.l.

***Tetrix subulata* (Linnaeus, 1758)**

Vratsa, GN08, 18.6.1958, 1 ♀, leg. GP, coll. NMNH. Close to Vrachanska Planina but beyond its borders, it is found near Varshets, 25.5.1966 (Pešev 1974, identified incorrectly as *Tetrix bolivari* Saulcy), FN88, 19.6.1958, 1 ♂, 1 ♀; 22.6.1964, 1 ♂; 25.5.1966, 4 ♂♂, 3 ♀♀, all leg. GP, coll. NMNH.

Holarctic species. In Bulgaria, it occurs mainly in mountains up to 2000 m altitude and more rarely in lowlands.

***Tetrix tuerki* (Krauss, 1876)**

This species is not recorded in Vrachanska Planina but is found nearby beyond its border in Varshets on the bank of Botunya River, 800 m, 25.5.1966 (Pešev 1974), FN88, 19.6.1958, 7 ♂♂, 3 ♀♀, leg. GP, coll. NMNH; 25.5.1966, 12 ♂♂, 1 ♀, coll. NMNH, 1 ♂, coll. Historical Museum Blagoevgrad, both leg. GP.

Central and South European species. A rare and fragmentarily distributed species in lowlands and foothills of the mountains up to 800 m a.s.l.

***Tetrix depressa* Brisout de Barneville, 1848**

Vratsa, GN08, 17.6.1958, 2 ♀♀, leg. GP, coll. NMNH. At the border of Vrachanska Planina, this species is found in Lakatnik Railway Station, FN97, 28.9.1954, leg. I. Buresch (Buresch & Peschev 1955); 28.10.1934, 1 ♀, leg. I. Buresch, coll. NMNH.

Turanian–Mediterranean species. In Bulgaria, this common species inhabits lowlands and mountains up to 1700 m altitude.

A C R I D O I D E A

ACRIDIDAE

CALLIPTAMINAE

C a l l i p t a m i n i

***Calliptamus italicus* (Linnaeus, 1758)**

Near Parshevitsa Chalet, GN08, N 43°08′, E 23°28′, 1450 m, stony area at the rocky cliff overgrown with grass, 18.9.2012, adults, DCh obs. Between Okolchitsa place and Vola place, GN08, N 43°11′, E 23°33′, 970 m, ruderal stony pasture, 19.9.2012, adults, DCh obs. Zverino, GN07, N 43°05′, E 23°33′, 500 m, ruderal stony habitat with young trees of *Carpinus*, 19.9.2012, adults, DCh obs. At a distance of only 2.5 km beyond the borders of Vrachanska Planina, this species is found near Varshets, FN88, 1 ♀, coll. NMNH, and near Druzhevo, FN97, N 43°08′, E 23°21′, 1050 m, xeromesophytic stony meadows with partly ruderalised vegetation, 16.9.2012, adults, DCh obs.

Turanian–Mediterranean species. *Calliptamus italicus* is very common in Bulgaria up to 2000 m a.s.l. It often develops in mass and is a significant pest in lowlands.

***Paracaloptenus caloptenoides caloptenoides* (Brunner von Wattenwyl, 1861)**

Between Eliseina and Parshevitsa Chalet, GN07, N 43°08′, E 23°30′, 1345 m, stony slope surrounded by mesoxerophytic herbaceous vegetation above a forest of *Fagus sylvatica* and below the rocky cliff, 20.9.2012, adults, DCh obs.

Paracaloptenus caloptenoides is an Eastern Mediterranean species. *Paracaloptenus caloptenoides caloptenoides* belongs to the Southeastern European chorotype. It occurs in lowlands and mountains up to 2000 m altitude mainly in South Bulgaria.

MELANOPLINAE

P o d i s m i n i

***Miramella* sp.**

Yolkovitsa place near Okolchitsa, GN08, N 43°09′, E 23°34′, 1045-1066 m, 19.9.2012, adults, leg. G. Hristov.

To date, the only record of *Miramella* in Bulgaria is from the area of Kostenets (Nedelkov 1908) referring to *Podisma alpina* Koll. var. *collina* Brun. W. At that time, it was the only known species of the genus *Miramella* in Europe. Existence of forms with different length of wings and lack of distinguishing characters in females make problematic the species identification.

***Podisma pedestris pedestris* (Linnaeus, 1758)**

Podisma pedestris (L.): Nedelkov 1908: 424; Buresch & Peschev 1955: 20.

Vratsa (Nedelkov 1908); Vrachanska Planina, 1 specimen, leg. NN, coll. NMNH (Buresch & Peschev 1955); Vratsa, GN08, 2 ♀♀, leg. NN, coll. NMNH.

Both the species and the nominate subspecies are Eurosiberian taxa. This common mountain species is distributed up to the highest parts of the mountains but rarely occurs at their foothills. Several isolated populations inhabit lowland and hilly areas in Eastern Bulgaria.

***Pseudopodisma fieberi* (Scudder, 1897)**

Podisma fieberi Scudd.: Nedelkov 1908: 424.
Pseudopodisma fieberi (Scudd.): Buresch & Peschev 1955: 19; Pešev 1974: 77.
Pseudopodisma n. sp.: Peschev 1970: 196.
Pseudopodisma sp.: Pešev 1974: 77.

Near Parshevitsa Chalet, 1200 m, 14.9.1964, 1 ♀ (Peschev 1970); GN08, 14.9.1964, 1 ♀, leg. GP, coll. NMNH. Between Vratsa and Parshevitsa Chalet, GN08, N 43°10′, E 23°29′, 1000-1100 m, mesophytic clearing on carbonate stony substrate, 13.7.2014, adults, DCh obs. Vrachanska Planina, 1200 m, 14.9.1964 (Pešev 1974, as *Pseudopodisma* sp.); above 1000 m, 15.9.1964 and 17-18.8.1966 (Pešev 1974, as *Pseudopodisma fieberi*); 1300 m, 18.8.1966, 4 ♂♂; 1100 m, 17.8.1966, 1 ♂, 1 ♀, both leg. GP, coll. NMNH. Vratsa (Nedelkov 1908); Vrachanska Planina, 2 specimens, leg. NN, coll. NMNH (Buresch & Peschev 1955); Vratsa, GN08, June 1909, 2 ♂♂; July 1909, 1 ♂, 2 ♀♀, both leg. NN, coll. NMNH; 6.8.1957, 4 ♂♂, 2 ♀♀; 23.6.1964, 9 ♂♂, 8 ♀♀, both leg. GP, coll. NMNH.

Pseudopodisma fieberi is a Southeastern European species. In Bulgaria, it occurs only in the mountains in the western part of the country between Western and Central Stara Planina in the north and Osogovo and Rila mountains in the south, from 1000 to 2000 m a.s.l.

***Odontopodisma decipiens decipiens* Ramme, 1951**

Podisma schmidti Fieb.: Nedelkov 1908: 424 (nec Fieber, 1853).
Odontopodisma decipiens Ramme, 1951: Buresch & Peschev 1955: 18; Pešev 1974: 77; Chobanov 2009a: 16, 23, Fig. 9.

Vratsa (Nedelkov 1908); 7 specimens, coll. NMNH (Buresch & Peschev 1955); 23.6.1964 (Pešev 1974); GN08, July 1907, 2 ♂♂; 2 ♀♀, leg. NN, 23.6.1964, 1 ♂, 1 ♀, leg. GP, both coll. NMNH (Chobanov 2009a). At the border of Vrachanska Planina, this species is found in Troposhansko place between Bistrets and Beli Izvor, southwest of Nefela, along

Leva River, GN09, [N 43°14′30″, E 23°29′30″], 8.8.1906, 1 ♂, leg. NN, coll. NMNH (Chobanov 2009a). Two incompletely labelled specimens are collected in Iskar Gorge, 18.8.1966 (Pešev 1974); the same date, 2 ♀♀, leg. GP, coll. NMNH (Chobanov 2009a). It is possible that these specimens were found in the lower part of the gorge adjacent to Vrachanska Planina.

Both the species and the nominate subspecies are taxa with Central and Southeastern European chorotype. *Odontopodisma decipiens* is distributed in Bulgaria in lowlands and mountains up to 1700 m altitude.

***Odontopodisma montana* Kis, 1962**

Opletnya, GN07, 500-600 m, groves of *Carpinus orientalis*, 20.9.2012, adults, DCh obs.

This species is reported quite recently for the first time for Bulgaria (Chobanov 2009a). It is a rare species in this country.

Odontopodisma montana is a Carpathian–Northern Balkan species. In Bulgaria, it is known only from Northwestern Bulgaria (in the east to Central Stara Planina Range), Western Rhodopes and Sakar Mts. up to 2000 m a.s.l.

CATANTOPINAE

P e z o t e t t i g i n i

***Pezotettix giornae* (Rossi, 1794)**

Pezotettix giornae (Rossi): Buresch & Peschev 1955: 16.

Vratsata place above Zgorigrad, GN08, N 43°12′, E 23°30′, 860 m, trees and grass vegetation on rocky terrain, 18.9.2012, adults, DCh obs. Toshkova Mogila Peak, GN08, N 43°12′, E 23°30′, 1000-1130 m, stony habitat with shrubs and herbaceous vegetation, 18.9.2012, adults, DCh obs. Between Okolchitsa place and Vola place, GN08, N 43°11′, E 23°33′, 970 m, ruderal stony pasture, 19.9.2012, adults, DCh obs. Vratsa, GN08, 15.8.1949, 2 specimens, leg. S. Minkova, coll. NMNH (Buresch & Peschev 1955).

Holomediterranean species. This common species occurs in Bulgaria up to 1500 m altitude (usually up to 1100 m).

ACRIDINAE

A c r i d i n i

***Acrida ungarica* (Herbst, 1786)**

Zverino, GN07, N 43°05′, E 23°33′, 500 m, ruderal stony habitat with young trees of *Carpinus*, 19.9.2012, adults, DCh obs.

Acrida ungarica is a Holomediterranean species. In Bulgaria, it is common in the lowlands and in the lowest belt of the mountains (rarely up to 800 m a.s.l.).

OEDIPODINAE

L o c u s t i n i

***Psophus stridulus* (Linnaeus, 1758)**

Psophus stridulus (L.): Nedelkov 1908: 421; Buresch & Peschev 1955: 75; Pešev 1974: 82.

Between Vratsa and Parshevitsa Chalet, GN08, N 43°10′, E 23°29′, 1000-1100 m, mesophytic clearing on carbonate stony substrate, 13.7.2014, nymphs of last instar, DCh obs. Vrachanska Planina, July 1903, 1 specimen, coll. NMNH (Buresch & Peschev 1955); 1000-1400 m, 15.9.1964 and 18.8.1966 (Pešev 1974). Vratsa, GN08 (Nedelkov 1908).

Psophus stridulus is a Eurosiberian species. It occurs only in mountains from 800

to 2600 m altitude.

O e d i p o d i n i

***Oedipoda caerulescens caerulescens* (Linnaeus, 1758)**

Above Gorno Ozirovo, FN98, N 43°14′, E 23°24′, 370 m, xeromesophytic meadows with shrubs and groves of *Carpinus orientalis*, 17.9.2012, adults, DCh obs. Between Okolchitsa place and Vola place, GN08, N 43°11′, E 23°33′, 970 m, ruderal stony pasture, 19.9.2012, adults, DCh obs. Zverino, GN07, N 43°05′, E 23°33′, 500 m, ruderal stony habitat with young trees of *Carpinus*, 19.9.2012, adults, DCh obs. At a distance of only 2.5 km beyond the borders of Vrachanska Planina, this species is found near Varshets, FN88, 15.7.2000, 1 ♀, 1 female last instar nymph, coll. SU, and near Druzhevo, FN97, N 43°08′, E 23°21′, 1050 m, xeromesophytic stony meadows with partly ruderalised vegetation, 16.9.2012, adults, DCh obs. It is published also from Iskar Gorge without exact locality (Buresch & Peschev 1955, as *Oedipoda coerulescens* [sic!]). Such common and widely distributed in Bulgaria species undoubtedly occurs also in the part of Iskar Gorge adjacent to Vrachanska Planina.

Both the species and the nominate subspecies are Palearctic taxa. One of the most common species of Orthoptera distributed throughout Bulgaria up to 2000 m a.s.l.

***Oedipoda germanica* (Latreille, 1804)**

Vratsata place above Zgorigrad, GN08, N 43°12′, E 23°30′, 860 m, trees and grass vegetation on rocky terrain, 18.9.2012, adults, DCh obs. Toshkova Mogila Peak, GN08, N 43°12′, E 23°30′, 1000-1130 m, stony habitat with shrubs and herbaceous vegetation, 18.9.2012, adults, DCh obs. Markov Kamak Peak, GN08, N 43°11′, E 23°33′, 1000 m, stony habitat, 19.9.2012, adults, DCh obs. At a distance of only 2.5 km beyond the borders of Vrachanska Planina, this species is found near Druzhevo, FN97, N 43°08′, E 23°21′, 1050 m, xeromesophytic stony meadows with partly ruderalised vegetation, 16.9.2012, adults, DCh obs.

Oedipoda germanica is a Central and South European species. It occurs in lowlands and mountains in Bulgaria without its northwestern and southeastern corners up to 1900 m altitude. The localities in Vrachanska Planina are the only ones known so far in Northwestern Bulgaria to the west of Iskar River.

S p h i n g o n o t i n i

***Sphingonotus* (*Sphingonotus*) *caerulans caerulans* (Linnaeus, 1767)**

Sphingonotus coerulans [sic!] Lin.: Nedelkov 1908: 422.

Vratsa, GN08 (Nedelkov 1908).

Both the species and the nominate subspecies are Western Palearctic taxa. In Bulgaria, *Sphingonotus caerulans caerulans* inhabits lowlands and lower parts of mountain slopes up to 900 m a.s.l. It does not occur along the Black Sea Coast where another subspecies (or form) is distributed.

A c r o t y l i n i

***Acrotylus insubricus insubricus* (Scopoli, 1786)**

At the border of Vrachanska Planina, this species is found in Lakatnik Railway Station, FN97, 12.7.1933, 1 specimen; 28.10.1934, 1 specimen, both leg. I. Buresch, coll. NMNH (Buresch & Peschev 1955).

Both the species and the nominate subspecies are Paleotropical–Palearctic taxa. A common

species in lowlands and lower parts of the mountains in Bulgaria up to 1300 m altitude.

E p a c r o m i i n i

***Aiolopus strepens* (Latreille, 1804)**

Epacromia strepens Latr.: Nedelkov 1908: 421.
Aiolopus strepens (Latr.): Buresch & Peschev 1955: 67.

Between Okolchitsa place and Vola place, GN08, N 43°10′, E 23°34′, 1055 m, mesophytic wood clearings, 19.9.2012, adults; N 43°11′, E 23°33′, 970 m, ruderal stony pasture, 19.9.2012, adults, both DCh obs. Vratsa, GN08 (Nedelkov 1908; Buresch & Peschev 1955).

This species is Holomediterranean. In Bulgaria, it is common in lowlands and mountains up to 1800 m a.s.l.

***Aiolopus thalassinus thalassinus* (Fabricius, 1781)**

Aiolopus thalassinus (Fab.): Buresch & Peschev 1955: 67.

Vratsa, GN08, July, 1 specimen, leg. NN, coll. NMNH (Buresch & Peschev 1955).

Aiolopus thalassinus is a Paleotropical–Palearctic species. *Aiolopus thalassinus thalassinus* belongs to the Afrotropical–Palearctic chorotype. In Bulgaria, this species occurs in lowlands, lower plains and kettles of Bulgaria up to 600 m altitude.

GOMPHOCERINAE

C h r y s o c h r a o n t i n i

***Chrysochraon dispar dispar* (Germar, [1834])**

Vratsa, GN08, 23.6.1964, 2 ♂♂, leg. GP, coll. NMNH.

Both the species and the nominate subspecies are Eurosiberian taxa. *Chrysochraon dispar* is a rare mountain species in Bulgaria which occurs only in Stara Planina Range, Vitosha Mts. and Western Rhodopes between 650 and 1500 m a.s.l.

***Euthystira brachyptera brachyptera* (Ocskay, 1826)**

Euthystira brachyptera brachyptera (Oksk. [sic!]): Pešev 1974: 78.

Near Parshevitsa Chalet, GN08, N 43°08′, E 23°28′, 1450 m, stony area at the rocky cliff overgrown with grass, 18.9.2012, adults, DCh obs. Between Eliseina and Parshevitsa Chalet, GN07, N 43°08′, E 23°30′, 1345 m, stony slope surrounded by mesoxerophytic herbaceous vegetation above a forest of *Fagus sylvatica* and below the rocky cliff, 20.9.2012, adults, DCh obs. Between Vratsa and Parshevitsa Chalet, GN08, N 43°10′, E 23°29′, 1000-1100 m, mesophytic clearing on carbonate stony substrate, 13.7.2014, adults, DCh obs. Above Vratsa, GN08, 1050 m, 15.9.1964 (Pešev 1974).

Both the species and the nominate subspecies are Eurosiberian taxa. In Bulgaria, *Euthystira brachyptera* is a common species in the mountains up to 2000 m altitude.

***Euchorthippus declivus* (Brisout de Barneville, 1848)**

Stenobothrus (*Chorthippus*) *pulvinatus* Nedelkov 1908: 419 (nec Fischer von Waldheim, 1846).
Euchorthippus pulvinatus Buresch & Peschev 1955: 65 (nec Fischer von Waldheim, 1846).

Between Eliseina and Parshevitsa Chalet, GN07, N 43°08′, E 23°30′, 1345 m, stony slope surrounded by mesoxerophytic herbaceous vegetation above a forest of *Fagus sylvatica* and below the rocky cliff, 20.9.2012, adults, DCh obs. Vratsata place above Zgorigrad, GN08, N 43°12′, E 23°30′, 860 m, trees and grass vegetation on rocky terrain, 18.9.2012, adults, DCh obs. Vratsa (Nedelkov 1908); 15.7.1949, 1 specimen, leg. S. Minkova, coll.

NMNH (Buresch & Peschev 1955); GN08, 15 August, 1 ♀, coll. NMNH. At the border of Vrachanska Planina, this species is found in Lakatnik, FN97, 12.7.1933, 1 specimen, leg. N. Atanasov, coll. NMNH (Buresch & Peschev 1955); the same data, 1 ♀, coll. NMNH; and in Troposhansko place between Bistrets and Beli Izvor, southwest of Nefela, along Leva River, GN09, [N 43°14′30″, E 23°29′30″], 8.8.1906, 4 ♀♀, leg. NN, coll. NMNH. At a distance of only 2.5 km beyond the borders of Vrachanska Planina, it is found near Druzhevo, FN97, N 43°08′, E 23°21′, 1050 m, xeromesophytic stony meadows with partly ruderalised vegetation, 16.9.2012, adults, DCh obs.

Earlier records of *Euchorthippus pulvinatus* (Fischer von Waldheim, 1846) from Vrachanska Planina are based on its supposed synonymy with *Euchorthippus declivus* and actually concern the latter.

A Central and South European species. It is very common in lowlands and foothills of the mountains throughout Bulgaria.

A r c y p t e r i n i

***Arcyptera* (*Arcyptera*) *fusca* (Pallas, 1773)**

Arcyptera fusca (Pall.): Nedelkov 1908: 420; Buresch & Peschev 1955: 39.
Arcyptera fusca fusca (Pall.): Pešev 1974: 78.

Between Vratsa and Parshevitsa Chalet, GN08, N 43°10′, E 23°29′, 1000-1100 m, mesophytic clearing on carbonate stony substrate, 13.7.2014, adults, DCh obs. Vrachanska Planina, 1 specimen, leg. NN, coll. NMNH (Buresch & Peschev 1955); 1150 m, 6.8.1957 (Pešev 1974). Vratsa, GN08 (Nedelkov 1908); June, 1 ♂, leg. NN, coll. NMNH. At the border of Vrachanska Planina, this species is found in Troposhansko place between Bistrets and Beli Izvor, southwest of Nefela, along Leva River, GN09, [N 43°14′30″, E 23°29′30″], 8.8.1906, 2 ♂♂, leg. NN, coll. NMNH.

Arcyptera fusca has a Eurosiberian distribution and is common in the high mountains of Bulgaria up to 2000 m a.s.l. Occurrence in the foothills of some mountains down to 400 m is rare.

D o c i o s t a u r i n i

***Dociostaurus* (*Kazakia*) *brevicollis* (Eversmann, 1848)**

Stauronotus brevicollis Eversm.: Nedelkov 1908: 420.
Dociostaurus brevicollis (Ev.): Buresch & Peschev 1955: 45.

Cherepish Monastery, GN17 (Nedelkov 1908; Buresch & Peschev 1955). Close to Vrachanska Planina but beyond its borders, this species is found near Mezdra, GN18 (Nedelkov 1908; Buresch & Peschev 1955).

Dociostaurus brevicollis is a Southeastern European–Western and Central Asian species, which occurs in Bulgaria in lowlands and mountains up to 2000 m altitude.

S t e n o b o t h r i n i

***Stenobothrus stigmaticus stigmaticus* (Rambur, 1838)**

Stenobothrus stigmaticus (Ramb.): Pešev 1974: 79.

Near Parshevitsa Chalet, GN08, N 43°09′, E 23°28′, 1325-1470 m, mesophytic clearings with excessive pasture and isolated overgrown areas, 18.9.2012, adults, DCh obs. Vrachanska Planina, 1400 m (Pešev 1974).

Harz (1975) describes *Stenobothrus stigmaticus faberi* from Central Europe and the Balkan Peninsula, including Bulgaria. According to Clemente *et al.* (1989), it is not possible to distinguish *Stenobothrus stigmaticus stigmaticus* and *Stenobothrus stigmaticus faberi* Harz, 1975. The Greek populations (hence the Bulgarian ones, too) belong after Willemse &

Willemse (2008) to the nominate subspecies. Braun (2009, in Eades *et al.* 2015) points to the fact that possibly all specimens from Central Europe and Balkan Peninsula belong to *Stenobothrus stigmaticus faberi* but its status is apparently unclear and rarely recognized. According to Eades *et al.* (2015), the Balkan Peninsula is inhabited by the nominate subspecies. Until resolving this problem, we consider the population in Vrachanska Planina as belonging to *Stenobothrus stigmaticus stigmaticus*.

Both the species and the nominate subspecies are Central and South European taxa. *Stenobothrus stigmaticus* is a typical mountain species occurring in high mountains and kettles in Western Bulgaria between 600 and 2100 m a.s.l.

***Stenobothrus nigromaculatus nigromaculatus* (Herrich-Schäffer, 1840)**

Near Parshevitsa Chalet, GN08, N 43°09′, E 23°28′, 1325-1470 m, mesophytic clearings with excessive pasture and isolated overgrown areas, 18.9.2012, adults, DCh obs.

Both the species and the nominate subspecies are Eurosiberian taxa. *Stenobothrus nigromaculatus* is distributed in Bulgaria only in the mountains, except those in Southeastern Bulgaria. It is found in Stara Planina from 500 to 2000 m and in the mountains of South Bulgaria from 900 to 2300 m altitude.

***Stenobothrus lineatus lineatus* (Panzer, 1796)**

Stenobothrus (*Stenobothrus*) *lineatus* Panz.: Nedelkov 1908: 418.
Stenobothrus lineatus (Panz.): Uvarov 1949: 93; Buresch & Peschev 1955: 49.

Near Parshevitsa Chalet, GN08, N 43°09′, E 23°28′, 1325-1470 m, mesophytic clearings with excessive pasture and isolated overgrown areas, 18.9.2012, adults, DCh obs. Between Vratsa and Parshevitsa Chalet, GN08, N 43°10′, E 23°29′, 1000-1100 m, mesophytic clearing on carbonate stony substrate, 13.7.2014, adults, DCh obs. Vratsa, GN08 (Nedelkov 1908); 14.8.[1939], 3 specimens, [leg. Harald Lindberg, Håkan Lindberg, P.Lindberg, coll. Zoological Museum of the University of Helsinki] (Uvarov 1949); Vrachanska Planina, 2 specimens, leg. NN, coll. NMNH (Buresch & Peschev 1955). At the border of Vrachanska Planina, this species is found in Troposhansko place between Bistrets and Beli Izvor, southwest of Nefela, along Leva River, GN09, [N 43°14′30″, E 23°29′30″], 8.8.1906, 1 ♂, 2 ♀♀, leg. NN, coll. NMNH. Close to Vrachanska Planina but beyond its borders, it is collected near Varshets, FN88, 13-14.7.2000, 3 ♀♀, coll. SU.

Both the species and the nominate subspecies are Eurosiberian taxa. *Stenobothrus lineatus* occurs from the lowlands of North Bulgaria to 2100 m a.s.l. in the mountains of South Bulgaria. It has not been found in the Thracian Lowland and in Southeastern Bulgaria.

***Stenobothrus rubicundulus* Kruseman & Jeekel, 1967**

Stenobothrus rubicundulus Kruseman & Jeekel, 1967: Berger, Chobanov & Mayer 2010: Appendix 1.

Okolchitsa place (as Vrachanski Balkan National Park [now Nature Park] near Botev Memorial, near Chelopek), GN08, N 43°09′, E 23°34′, 1065 m, 30.6.2002, leg. D. Berger and V. Vedenina, coll. D. Berger, Dresden (Berger *et al.* 2010).

Stenobothrus rubicundulus has a Central and South European chorotype. In Bulgaria, it is a mountain species distributed from 200 to 2000 m altitude in Stara Planina Range, Konyavska Planina Mts., Rila Mts., Pirin Mts., Slavyanka Mts. and Western Rhodopes. Occurrence in lowlands is very rare.

***Omocestus* (*Omocestus*) *minutus* (Brullé, 1832)**

Stenobothrus (*Omocestus*) *petraeus* Nedelkov 1908: 419 (nec Brisout de Barneville, 1856).
Omocestus petraeus Buresch & Peschev 1955: 55 (nec Brisout de Barneville, 1856).

Vratsa, GN08 (Nedelkov 1908; Buresch & Peschev 1955).

We consider the record of Nedelkov (1908) as misidentification because the two species at that time usually have not been distinguished and *Omocestus minutus* is considerably more common and densely distributed in Bulgaria than *Omocestus petraeus*.

This Southeastern European species is common in lowlands and foothills throughout Bulgaria up to 1000 m altitude and very rarely higher.

***Omocestus* (*Omocestus*) *haemorrhoidalis haemorrhoidalis* (Charpentier, 1825)**

Omocestus petraeus Pešev 1974: 80 (nec Brisout de Barneville, 1856).

Near Parshevitsa Chalet, GN08, N 43°09′, E 23°28′, 1325-1470 m, mesophytic clearings with excessive pasture and isolated overgrown areas, 18.9.2012, adults, DCh obs. Parshevitsa, 14-15.9.1964 (Pešev 1974); Parshevitsa Chalet, GN08, 1200 m, 14.9.1964, 1 ♂, leg. GP, coll. NMNH. Between Okolchitsa place and Vola place, GN08, N 43°11′, E 23°33′, 970 m, ruderal stony pasture, 19.9.2012, adults, DCh obs.

Due to the lack of preserved material of *Omocestus* (*Omocestus*) *petraeus* (Brisout de Barneville, 1856) from Vrachanska Planina, confusion with other species of *Omocestus* is possible. The presence of a male which belongs to *Omocestus haemorrhoidalis* from the samples of Georgi Peshev in coll. NMNH from the same place and date suggests a misidentification.

Both the species and the nominate subspecies are Eurosiberian taxa. *Omocestus haemorrhoidalis* occurs in mountains (except those in Southeastern Bulgaria) and their foothills from 500 to 2300 m a.s.l.

***Omocestus* (*Omocestus*) *rufipes* (Zetterstedt, 1821)**

Stenobothrus (*Omocestus*) *rufipes* Zett.: Nedelkov 1908: 418.

Between Okolchitsa place and Vola place, GN08, N 43°11′, E 23°33′, 970 m, ruderal stony pasture, 19.9.2012, adults, DCh obs. Above Vratsa, GN08, 980 m, 15.9.1964, 1 ♀; 860 m, 15.9.1964, 1 ♀, both leg. GP, coll. NMNH. Vratsa, GN08 (Nedelkov 1908). Beyond the borders of Vrachanska Planina but very close to it, this species is found near Varshets, FN88, 1.8.1996, 1 ♂, leg. S. Georgieva, coll. NMNH; 27.6.2000, 1 ♂; 28.6.2000, 1 ♂; 29.6.2000, 1 ♀; 12.7.2000, 1 ♀; 14.7.2000, 2 ♂♂; 29.7.2000, 1 ♂; all coll. SU.

Omocestus rufipes is a Palearctic species. It is very common in Bulgaria up to 2000 m a.s.l. (usually up to 1500 m).

G o m p h o c e r i n i

***Myrmeleotettix maculatus maculatus* (Thunberg, 1815)**

Myrmeleotettix maculatus (Thunb.): Peschev 1970: 175-177.

The ridge of Vrachanska Planina (Peschev 1970).

Both the species and the nominate subspecies are Eurosiberian taxa. *Myrmeleotettix maculatus* is a typical mountain species which inhabits Stara Planina Range, the mountains in Southwestern Bulgaria and Western Rhodopes above 1200 m altitude.

***Gomphocerus sibiricus sibiricus* (Linnaeus, 1767)**

Gomphocerus sibiricus sibiricus (L.): Pešev 1974: 80.

Vrachanska Planina, 1200 m, 15.9.1964 (Pešev 1974).

This species is a glacial relict with boreomontane distribution. Both the species and the nominate subspecies are Eurosiberian taxa. *Gomphocerus sibiricus* occurs in Bulgaria only above 1200 m altitude in high mountains.

***Stauroderus scalaris scalaris* (Fischer von Waldheim, 1846)**

Stauroderus scalaris scalaris (F. W.): Peschev 1970: 175-177.

Between Vratsa and Parshevitsa Chalet, GN08, N 43°10′, E 23°29′, 1000-1100 m, mesophytic clearing on carbonate stony substrate, 13.7.2014, adults, DCh obs. The ridge of Vrachanska Planina (Peschev 1970).

Both the species and the nominate subspecies are Eurosiberian taxa. *Stauroderus scalaris* occurs in Stara Planina Range, the mountains in Southwestern Bulgaria, Western Rhodopes and their foothills usually above 1000 and up to 2500 m a.s.l.

***Pseudochorthippus parallelus parallelus* (Zetterstedt, 1821)**

Stenobothrus (*Chorthippus*) *parallelus* Zett.: Nedelkov 1908: 420.
Chorthippus longicornis (Latr.): Buresch & Peschev 1955: 62.
Chorthippus vagans Peschev 1970: 196-197 (nec Eversmann, 1848); Pešev 1971: 220 (nec Eversmann, 1848); Pešev 1974: 80 (nec Eversmann, 1848).
Chorthippus montanus Pešev 1974: 81 (nec Charpentier, 1825).
Chorthippus parallelus (Zetterstedt, 1821): Chobanov 2009a: 24-25.

Near Parshevitsa Chalet, GN08, N 43°09′, E 23°28′, 1325-1470 m, mesophytic clearings with excessive pasture and isolated overgrown areas, 18.9.2012, adults, DCh obs. Parshevitsa Chalet, 1200 m, 14.9.1964, 1 ♂ (Peschev 1970; Pešev 1971); the same data, 1 ♀ (Pešev 1974); GN08, 14.9.1964, 1 macropterous female, leg. GP, det. GP as *Chorthippus vagans* (Charp. [sic!]), coll. NMNH. Between Vratsa and Parshevitsa Chalet, GN08, N 43°10′, E 23°29′, 1000-1100 m, mesophytic clearing on carbonate stony substrate, 13.7.2014, adults, DCh obs. Toshkova Mogila Peak, GN08, N 43°12′, E 23°30′, 1000-1130 m, stony habitat with shrubs and herbaceous vegetation, 18.9.2012, adults, DCh obs. Vrachanska Planina, 1400 m, 18.8.1966 (Pešev 1974); 1300 m, 18.8.1966, 1 ♂, leg. GP, det. GP as *Chorthippus montanus* (Charp.), coll. NMNH (Chobanov 2009a). Vratsa, GN08 (Nedelkov 1908); Vratsa area, 1 specimen, leg. NN, coll. NMNH (Buresch & Peschev 1955). At the border of Vrachanska Planina, this species is found in Troposhansko place between Bistrets and Beli Izvor, southwest of Nefela, along Leva River, GN09, [N 43°14′30″, E 23°29′30″], 8.8.1906, 1 ♀, leg. NN, coll. NMNH. Beyond the borders of Vrachanska Planina but very close to it, it is found near Zanozhene (suburb of Varshets), FN88, 22.6.1964, 1 ♂, leg. GP, det. GP as *Chorthippus montanus* (Charp.), coll. NMNH (Chobanov 2009a); and Varshets, FN88, 15-16.7.2000, 2 ♂♂, coll. SU.

The information of Peschev (1970, 1971, 1974) on *Chorthippus montanus* and *Chorthippus vagans* in Vrachanska Planina is due to misidentification. G. Peschev has had in mind the nominate subspecies of *Chorthippus vagans*, the only subspecies at that time known from Europe. Both *Pseudochorthippus montanus* and *Chorthippus vagans vagans* do not occur in Bulgaria and preserved material from Vrachanska Planina belongs to *Pseudochorthippus parallelus*.

Both the species and the nominate subspecies are Eurosiberian taxa. *Pseudochorthippus parallelus* is very common in Bulgaria up to 2600 m altitude.

***Chorthippus* (*Chorthippus*) *dorsatus dorsatus* (Zetterstedt, 1821)**

Chorthippus dichrous Pešev 1974: 81 (nec Eversmann, 1859).

Near Parshevitsa Chalet, GN08, N 43°09′, E 23°28′, 1325-1470 m, mesophytic clearings with excessive pasture and isolated overgrown areas, 18.9.2012, adults, DCh obs. Toshkova Mogila Peak, GN08, N 43°12′, E 23°30′, 1000-1130 m, stony habitat with shrubs and herbaceous vegetation, 18.9.2012, adults, DCh obs. Between Okolchitsa place and Vola place, GN08, N 43°10′, E 23°34′, 1055 m, mesophytic wood clearings, 19.9.2012, adults; N 43°11′, E 23°33′, 970 m, ruderal stony pasture, 19.9.2012, adults, both DCh obs. Above Vratsa, GN08, 980 m, 15.9.1964, 1 ♀, leg. GP, coll. NMNH. Vratsa, GN08, the same date (Pešev 1974). At a distance of only 2.5 km beyond the borders of Vrachanska Planina, this species is found near Druzhevo, FN97, N 43°08′, E 23°21′, 1050 m, xeromesophytic stony meadows with partly ruderalised vegetation, 16.9.2012, adults, DCh obs.

Both the species and the nominate subspecies are Eurosiberian taxa. *Chorthippus dorsatus* is common in Stara Planina Range, Western Rhodopes and in the mountains and their foothills in Southwestern Bulgaria up to 2000 m a.s.l.

***Chorthippus* (*Chorthippus*) *oschei pusztaensis* Vedenina & Helversen, 2009**

Stenobothrus (*Chorthippus*) *albomarginatus* Nedelkov 1908: 419 (nec De Geer, 1773).
Chorthippus albomarginatus Buresch & Peschev 1955: 64 (nec De Geer, 1773).
Chorthippus albomarginatus albomarginatus Pešev 1974: 81 (nec De Geer, 1773).
Chorthippus oschei v. Helversen, 1989: Chobanov 2009a: 18, Fig. 10.

Parshevitsa Chalet, GN08, 1250 m, 14.9.1964 (Pešev 1974; Chobanov 2009a). Vratsa, GN08 (Nedelkov 1908; Buresch & Peschev 1955: 62, as Vratsa area; Chobanov 2009a). Beyond the borders of Vrachanska Planina, it is found in the lowland about 2 km east of Vratsa [between Vratsa and Kostelevo], 30.6.2002, 2 ♂♂ paratypes, 1 ♀ paratype, song recording in 1 ♂, leg. V. Vedenina, coll. V. Vedenina, Moscow (Vedenina & Helversen 2009).

Chorthippus oschei is reported quite recently for the first time for Bulgaria (Chobanov 2009a). Before that time, it has been considered erroneously as *Chorthippus* (*Chorthippus*) *albomarginatus* (De Geer, 1773), a species distributed only in North and Central Europe. During the publication of the first records for Bulgaria, the populations in the Balkan Peninsula (except the Greek ones), Hungary, Moldova and Ukraine were described as a distinct subspecies by Vedenina & Helversen (2009).

Both the species and the subspecies are Southeastern European taxa. In Bulgaria, this rare and fragmentarily distributed grasshopper occurs up to 2000 m altitude.

***Chorthippus* (*Glyptobothrus*) *brunneus brunneus* (Thunberg, 1815)**

Close to Vrachanska Planina but beyond its borders, this species is collected near Varshets, FN88, 14.7.2000, 4 ♀♀; 15.7.2000, 1 ♂, both coll. SU.

Both the species and the nominate subspecies are Eurosiberian taxa. *Chorthippus brunneus* occurs in whole North Bulgaria while in South Bulgaria reaches southwards to Ruy Mts., Vitosha Mts., northern slopes of Rila Mts. and northwestern slopes of the Rhodopes up to 2000 m a.s.l. Undoubtedly, it inhabits Vrachanska Planina.

***Chorthippus* (*Glyptobothrus*) *biguttulus* cf. *hedickei* (Ramme, 1942)**

Stenobothrus (*Stauroderus*) *biguttulus* Nedelkov 1908: 419.

Near Parshevitsa Chalet, GN08, N 43°09′, E 23°28′, 1325-1470 m, mesophytic clearings with excessive pasture and isolated overgrown areas, 18.9.2012, adults, DCh obs. Parshevitsa Chalet, GN08, 1200 m, 14.9.1964, 1 ♂, leg. GP, coll. NMNH. Between Eliseina and Parshevitsa Chalet, GN07, N 43°08′, E 23°30′, 1345 m, stony slope surrounded by mesoxerophytic herbaceous vegetation above a forest of *Fagus sylvatica* and below the rocky cliff, 20.9.2012, adults, DCh obs. Vratsata place above Zgorigrad, GN08, N 43°12′, E 23°30′, 860 m, trees and grass vegetation on rocky terrain, 18.9.2012, adults, DCh obs. Toshkova Mogila Peak, GN08, N 43°12′, E 23°30′, 1000-1130 m, stony habitat with shrubs and herbaceous vegetation, 18.9.2012, adults, DCh obs. Between Okolchitsa place and Vola place, GN08, N 43°11′, E 23°33′, 970 m, ruderal stony pasture, 19.9.2012, adults, DCh obs. Vratsa, GN08 (Nedelkov 1908).

Two subspecies of this species occur in Bulgaria. Populations in the northwestern third of the country differ in morphology and song from *Chorthippus biguttulus euhedickei* Helversen, 1989, the subspecies inhabiting the rest of Bulgaria. Most likely they belong to *Chorthippus biguttulus hedickei*. The material of Nedelkov from Vratsa is not preserved and although the locality is situated in the middle of the range of the subspecies *hedickei* in Bulgaria, this record needs confirmation because of possible confusion with *Chorthippus brunneus*.

Chorthippus biguttulus hedickei belongs to the Southeastern European chorotype, while *Chorthippus biguttulus* is a Western Palearctic species. *Chorthippus biguttulus* inhabits Bulgaria up to 2000 m a.s.l. *Chorthippus biguttulus hedickei* occurs in Bulgaria to the northwest of the line Osogovo Mts. – Vitosha Mts. – Tetevenska Planina Mts. (in Central Stara Planina Range) – Sevlievo (in the Danubian Plain) from 500 to 1800 m a.s.l.

***Chorthippus* (*Glyptobothrus*) *mollis mollis* (Charpentier, 1825)**

Above Gorno Ozirovo, FN98, N 43°14′, E 23°24′, 370 m, xeromesophytic meadows with shrubs and groves of *Carpinus orientalis*, 17.9.2012, adults, DCh obs. Between Okolchitsa place and Vola place, GN08, N 43°11′, E 23°33′, 970 m, ruderal stony pasture, 19.9.2012, adults, DCh obs. Zverino, GN07, N 43°05′, E 23°33′, 500 m, ruderal stony habitat with young trees of *Carpinus*, 19.9.2012, adults, DCh obs. At a distance of only 2.5 km beyond the borders of Vrachanska Planina, this species is found near Druzhevo, FN97, N 43°08′, E 23°21′, 1050 m, xeromesophytic stony meadows with partly ruderalised vegetation, 16.9.2012, adults, DCh obs.

Both the species and the nominate subspecies are Eurosiberian taxa. *Chorthippus mollis* is a common species in Bulgaria up to 1800 m altitude, more abundant in the mountains and their foothills than in the lowlands.

***Gomphocerippus rufus* (Linnaeus, 1758)**

Near Parshevitsa Chalet, GN08, N 43°08′, E 23°28′, 1450 m, stony area at the rocky cliff overgrown with grass, 18.9.2012, adults, DCh obs. Between Eliseina and Parshevitsa Chalet, GN07, N 43°08′, E 23°30′, 1345 m, stony slope surrounded by mesoxerophytic herbaceous vegetation above a forest of *Fagus sylvatica* and below the rocky cliff, 20.9.2012, adults, DCh obs. Vratsata place above Zgorigrad, GN08, N 43°12′, E 23°30′, 860 m, trees and grass vegetation on rocky terrain, 18.9.2012, adults, DCh obs. Toshkova Mogila

Peak, GN08, N 43°12′, E 23°30′, 1000-1130 m, stony habitat with shrubs and herbaceous vegetation, 18.9.2012, adults and last instar nymphs, DCh obs.

Gomphocerippus rufus is a Eurosiberian species. This fragmentarily distributed in Bulgaria species inhabits the six highest and several lower mountains in Southwestern Bulgaria from 500 m (usually from 1000 m) up to 2200 m a.s.l.

B L A T T O D E A

B L A B E R O I D E A

ECTOBIIDAE

ECTOBIINAE

***Ectobius* (*Ectobius*) *erythronotus* Burr, 1898**

Ectobia panceri [sic!] Drenski 1939: 7 (nec Stephens, 1835).
Ectobius lapponicus Buresch & Peschev 1957: 317 (nec Linnaeus, 1758).

Cherepish Monastery, GN17, 2.5.1905, leg. I. Buresch (Drenski 1939; Buresch & Peschev 1957).

The current name of *Ectobius panzeri* is *Capraiellus panzeri* (Stephens, 1835). Its range covers Western Europe and Northwestern Africa. Buresch & Peschev (1957: 319) checked the specimens in coll. NMNH reported by Drenski (1939) as *Ectobia panceri* from many localities and determined them as belonging to *Ectobius lapponicus* (Linnaeus, 1758). They considered however *Ectobius erythronotus* as a morph of *Ectobius lapponicus* and identified all specimens published by Drenski under the name *Ectobia panceri* as belonging to this morph (Buresch & Peschev 1957: 315). A possibility that the specimens mentioned by Drenski include females of *Ectobius lapponicus* exists as well because, most likely for that time, Buresch & Peschev (1957) may have distinguished *Ectobius lapponicus* and *Ectobius erythronotus* only by the colour of the pronotum.

Ectobius erythronotus is a European species. It is common and widely distributed in Bulgaria mainly in the lowlands.

M A N T O D E A

MANTIDAE

MANTINAE

M a n t i n i

***Mantis religiosa* (Linnaeus, 1758)**

Near Parshevitsa Chalet, GN08, N 43°08′, E 23°28′, 1450 m, stony area at the rocky cliff overgrown with grass, 18.9.2012, adults, DCh obs.

Palearctic species, distributed in South Europe, Africa and Asia, and introduced in North America. It is widely distributed in Bulgaria in lowlands. The altitude of the record in Vrachanska Planina is high for this latitude. *Mantis religiosa* occurs in most cases in Bulgaria up to 1000 m and rarely in higher elevations (up to 1600-1650 m) only in the mountains, rich of thermophilous fauna, in South Bulgaria at the border with Greece.

Species diversity

The present study covers the orders Orthoptera, Blattodea and Mantodea. So far, 81 species are found in Vrachanska Planina, 79 of them belonging to Orthoptera and the

two other orders presented with one species each. Other six species of Orthoptera have been recorded in the areas up to 5 km out of the borders of Vrachanska Planina and undoubtedly are distributed also in the mountain.

First records from Vrachanska Planina are reported here for the order Mantodea and for the following taxa of the family group: superfamily Grylloidea; families Mantidae and Gryllidae; subfamilies Mantinae, Gryllinae, Nemobiinae, Calliptaminae and Acridinae; tribes Mantini, Decticini, Gryllini, Modicogryllini, Pteronemobiini, Calliptamini, Acridini and Oedipodini.

Taxa of the genus group not published from Vrachanska Planina until the present study are 16 genera (*Mantis*, *Decticus*, *Platycleis*, *Eupholidoptera*, *Polysarcus*, *Gryllus*, *Melanogryllus*, *Modicogryllus*, *Pteronemobius*, *Calliptamus*, *Paracaloptenus*, *Miramella*, *Acrida*, *Oedipoda*, *Chrysochraon*, *Gomphocerippus*) and three subgenera (*Gryllus* s.str., *Modicogryllus* s.str., *Pteronemobius* s.str.).

The following 31 species are mentioned in the present paper for the first time for Vrachanska Planina: *Ectobius erythronotus*, *Mantis religiosa*, *Decticus verrucivorus*, *Platycleis grisea*, *Pholidoptera griseoaptera*, *Eupholidoptera schmidti*, *Tettigonia viridissima*, *Saga pedo*, *Poecilimon fussii*, *Polysarcus denticauda*, *Gryllus campestris*, *Melanogryllus desertus*, *Modicogryllus truncatus*, *Pteronemobius heydenii*, *Tetrix tenuicornis*, *Tetrix subulata*, *Tetrix depressa*, *Calliptamus italicus*, *Paracaloptenus caloptenoides*, *Odontopodisma montana*, *Acrida ungarica*, *Oedipoda caerulescens*, *Oedipoda germanica*, *Chrysochraon dispar*, *Euchorthippus declivus*, *Stenobothrus nigromaculatus*, *Omocestus minutus*, *Omocestus haemorrhoidalis*, *Chorthippus dorsatus*, *Chorthippus mollis* and *Gomphocerippus rufus*. We do not mention the number of subspecies not published so far from Vrachanska Planina because the subspecies affiliation of the Bulgarian populations of some species is not clarified.

The total number of published species from the investigated area is 65. Among them, 16 have been incorrectly identified. Published specimens of 27 species were found in collections and were reidentified. New unpublished material from 59 species broadens the knowledge on the species diversity and distribution of the taxa in the mountain. Thereby, 70 species altogether are proven for Vrachanska Planina with checked material. Only 11 published species are not confirmed with examined specimens but their occurrence in the area of investigation is beyond doubt. The latter include three species of Tettigonioidea, seven species of Acridoidea and one species of Blattodea.

So far, 206 species (218 taxa) of Orthoptera are known from Bulgaria (Chobanov 2009b). Thus the species number presently known from Vrachanska Planina represents 39 % of the Bulgarian fauna of Orthoptera. Taken into consideration that the order includes many thermophilous species which with certainty do not occur in the investigated mountain, we regard the exploration of Orthoptera in the study area as good.

Four species of Mantodea occur in Bulgaria. One of them is found in Vrachanska Planina. The occurrence in the mountain of another species, *Ameles heldreichi* Brunner von Wattenwyl, 1882 is possible but not very likely. The remaining two species with certainty are not distributed in the investigated area.

From Blattodea, only one record dated 110 years ago exists and the order is completely unexplored in Vrachanska Planina. The only species so far found represents 6 % of the species number in Bulgaria.

Distribution

Horizontal distribution. The existing data on the treated systematic groups and the small size of Vrachanska Planina do not allow conclusions about the distribution of the species in it. Information of Nedelkov (1908) for all species is published with one and the same locality, Vratsa, and the labels in his collection in NMNH are Vratsa or Troposhansko place. Pešev (1974), as well as Peshev (1985), does not report concrete localities. In many cases the latter author mentions only "Vratsa" or "Vrachanska Planina" with a variety of altitudes (including on labels in coll. NMNH), e.g. Vratsa, 600 m, 980 m, 1200 m; Vrachanska Planina, 1100 m, 1300 m. Only the materials collected in the last years originate from various localities, with exact information on them, including geographical coordinates and data on habitat.

Vertical distribution. Data on the altitudinal distribution of the species by Georgi Peshev and from the last years samples are more detailed.

Most of species known from the mountain have wide altitudinal range. Species occurring from the lower to the highest parts of Vrachanska Planina are for instance *Poecilimon thoracicus* and *Ephippiger ephippiger* from Tettigonioidea, *Gryllus campestris* from Grylloidea, as well as *Pseudochorthippus parallelus* and *Stenobothrus lineatus* from Acridoidea.

Typical mountain species with a lower limit of distribution in Bulgaria running through the highest ridge of Vrachanska Planina are *Psorodonotus fieberi* from Tettigonioidea (above 1400 m a.s.l. in Bulgaria), *Gomphocerus sibiricus* and *Myrmeleotettix maculatus* from Acridoidea (above 1200 m in Bulgaria). Other species occurring only in the higher parts of the investigated area are *Pholidoptera aptera karnyi* and *Tettigonia balcanica* (Tettigonioidea), as well as *Pseudopodisma fieberi* and *Stauroderus scalaris* (Acridoidea). Common mountain species rarely inhabiting isolated localities in lowlands are for instance *Polysarcus denticauda* (Tettigonioidea) and *Podisma pedestris* (Acridoidea).

The low altitude of the foot of Vrachanska Planina enables the typical lowland species to inhabit the lower parts of its slopes and the Iskar Gorge. Examples of such species are *Tessellana veyseli*, *Ruspolia nitidula* and *Conocephalus hastatus* (Tettigonioidea), *Modicogryllus truncatus* and *Pteronemobius heydenii* (Grylloidea), *Aiolopus thalassinus*, *Acrida ungarica* and *Sphingonotus caerulans* (Acridoidea).

Zoogeography

Zoogeographical analysis of the orthopterid fauna in the explored area was accomplished on account of two aspects: the type of distributional range (chorotype) and the suggested category of origin (according to centres of dispersal).

Chorology. The chorotype for each species is presented in the List of species. Their names and coverage are after Popov (2007) with modifications and alterations. In all cases, they are applied for species, not for subspecies. The species from Vrachanska Planina belong to 25 categories. Most numerous are the representatives with Eurosiberian distribution – 16 (20 % of the species in the mountain), 15 from which belong to more widely distributed Acridoidea and only one is from Tettigonioidea. Second position is occupied by the category of Central and South European taxa with 13 species (16 %). The species of Tettigonioidea belonging to this chorotype are two times more than the species of Acridoidea. The next

chorotypes in the ranking are: Palearctic – 8 species (10 %), Southeastern European and Holomediterranean – 5 species each (6 %) and European – 4 species (5 %).

Origin. Categories for the centres of dispersal, i.e. for the origin, are used after the scheme of Popov (2007) in which part of the categories are according to de Lattin (1967). The species from Vrachanska Planina are divided in 14 categories of faunal elements. Most numerous are the Siberian species – 19 (23 % of the species in the mountain with predominance of Acridoidea). The Central European faunal elements are on the second position with 15 species (19 % of the species with prevalence of Tettigonioidea). They are taxa originated from the Extramediterranean European centres of dispersal. The next categories in the ranking are the Pontomediterranean (11 species or 14 %) and Holomediterranean (10 species or 12 %) faunal elements, the Montane Balkan species (7 species or 9 %) and the species with Siberian–Mediterranean distribution (6 species or 7 %). The last mentioned category unifies taxa that originated and dispersed from the Siberian centre and survived the last Pleistocene glaciations in refugia in the Mediterranean Subregion. During Interglacials they are supposed to migrate northwards from the refugia resettling the Boreal belt. Their recent ranges in the Mediterranean areas cover both the mountains and lower altitudes. The Pontomediterranean elements are divided into elements of expansive type of distribution (8 species) and of stationary type of distribution (3 species). By analogy, the Holomediterranean faunal elements are also divided into such of expansive type of distribution (9 species) and of stationary type of distribution (one species). The position of Vrachanska Planina far from the Mediterranean Subregion and from the areas of Mediterranean influence in Bulgaria explains the prevalence of species of expansive type.

Endemic and subendemic taxa. The endemic taxa of Orthoptera are well represented in Vrachanska Planina. The mountain harbours the endemic genus *Ancistrura*, five endemic species and the endemic subspecies *Pholidoptera aptera karnyi*. The narrowest degree of endemism and limited ranges are observed in *Isophya miksici* and *Isophya plevnensis* with ranges respectively in Northwestern Bulgaria and Central North Bulgaria. The genus *Isophya* is characterized with a high degree of endemism on the Balkan Peninsula and in Anatolia. The latter species is a Bulgarian endemic taxon. The remaining taxa are Balkan endemics. They are mountain taxa (*Psorodonotus fieberi*, *Tettigonia balcanica* and *Pholidoptera aptera karnyi*) or occur mainly in lowlands (*Ancistrura nigrovittata*). Beside them, five subendemic species and one subendemic subspecies are distributed in Vrachanska Planina. Their ranges include also the adjacent to the Balkan Peninsula areas of Italy, Romania or Turkey.

Limits of ranges. Because of the location of Vrachanska Planina at the northern margin of the mountains in the Balkan Peninsula, it outlines the range limits of some species. The northernmost locality of the genus *Ancistrura*, the westernmost locality of *Isophya plevnensis*, the easternmost locality of *Broughtonia domogledi* and the southernmost localities of *Leptophyes discoidalis* and *Isophya miksici* are situated within the explored area. Except for these species, Vrachanska Planina lies at the northern range limits of the genera *Broughtonia*, *Psorodonotus* and *Eupholidoptera* and of *Tettigonia balcanica* and *Pholidoptera aptera karnyi* as well as at the eastern limit of *Isophya modestior*.

Rare species. Some of the rarest species of Orthoptera in Bulgaria occur in Vrachanska Planina. The so far unidentified species of *Miramella* and *Leptophyes discoidalis* stand at the head of this line. *Phaneroptera falcata* and *Saga pedo* are also rare species. All abovementioned rare species except *Miramella* belong to Tettigonioidea.

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Правокрилите насекоми (Orthoptera), хлебарките (Blattodea) и богомолките (Mantodea) на Врачанската планина

АЛЕКСИ ПОПОВ, ДРАГАН ЧОБАНОВ

(Резюме)

Според публикувани и оригинални данни от групата на ортоптеридните разреди във Врачанската планина са установени досега 81 вида, от които 79 вида правокрили насекоми (Orthoptera) и по един вид хлебарка (Blattodea) и богомолка (Mantodea). В съседните на планината райони на разстояние до 5 км извън нейните граници са били намерени други шест вида правокрили насекоми. В настоящата статия се съобщават за първи път за Врачанската планина един разред, едно надсемейство, 2 семейства, 5 подсемейства, 8 трибуса, 16 рода, 3 подрода и 31 вида. Публикуван и оригинален материал от 70 вида е определен или ревизиран. Един подвид е синонимизиран: *Ephippiger ephippiger ephippiger* (Fiebig, 1784) (= *Ephippiger ephippiger balkanicus* Andreeva, 1985, **syn. n**.). Типични планински видове с долна граница на разпространение в България, минаваща по най-високото било на Врачанската планина, са *Psorodonotus fieberi*, *Gomphocerus sibiricus* и *Myrmeleotettix maculatus*. Констатираните видове са групирани в 25 категории по хорология и 14 категории по произход. Най-многобройни според хоротиповете са евросибирските видове (20 %), следвани от средно- и южноевропейските видове (16 %), а според произхода – сибирските (23 %), следвани от средноевропейските (19 %) фаунистични елементи. Ендемични таксони от правокрилите насекоми във Врачанската планина са един род, 5 вида и един подвид, един от които е български ендемичен вид, а останалите таксони са балкански ендемити. Най-северното, най-западното, най-източното или най-южното находище в ареалите на един род и 4 вида се намира във Врачанската планина. През планината минава северната или източната граница на ареала на други 3 рода, 2 вида и един подвид. *Leptophyes discoidalis* и *Miramella* sp. са едни от най-редките видове правокрили насекоми в България.

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Scarabaeoid beetles (Coleoptera: Scarabaeoidea) from Vrachanska Planina Mountains and Vrachanski Balkan Nature Park

YANA PETROVA, EVGENI CHEHLAROV, DENIS GRADINAROV

Abstract. A list of species of Scarabaeoidea from the territory of Vrachanska Planina Mts. and Vrachanski Balkan Nature Park is presented. A total of 64 species were established, from which 45 are new records for the investigated area. At the Nature Park territory 49 species were established. The species *Aphodius brevis, Aphodius pusillus*, *Aphodius paracoenosus*, *Aphodius contaminatus*, *Aphodius arenarius*, *Omaloplia illyrica*, *Anisoplia dispar* and *Trichius sexualis* are reported for the first time for Stara Planina Mts. For the species *Aphodius brevis* it is the second record for Bulgaria. The presence of *Chaetonyx robustus* in Stara Planina Mts. was confirmed and data about its abundance in the soil of the habitat are presented.

Key words: Lucanidae, Trogidae, Geotrupidae, Scarabaeidae, Stara Planina Mountains, protected areas, list of species, Bulgaria.

Introduction

No special research of Scarabaeoidea fauna of Vrachanska Planina Mts. or Vrachanski Balkan Nature Park has been conducted until now. Data about Scarabaeoidea species for Vrachanska Planina Mts., Iskarski Prolom Gorge or the neighbouring regions of Stara Planina Mts. can be found in several publications (Joakimov 1904, Nedelkov 1905, 1909, Pittioni 1940, Goljan 1953, Kantardzhieva-Minkova 1953, Zacharieva-Stoilova 1969, Král & Malý 1993, Guéorguiev & Bunalski 2004 etc.). The most comprehensive data for the park territory were reported by Zacharieva-Stoilova in publication from 1969, in which the author included original and literature data about Western Stara Planina Mts. The purpose of the present study was to compile a list of Scarabaeoidea species for the territory of Vrachanska Planina Mts. and the Vrachanski Balkan Nature Park territory by combining existing and original data. New and notable observations on the biology of some of the established species are presented as well.

Materials and methods

Data included in the list are only those literature with locality designation within the investigated area (Goljan 1953, Zacharieva-Stoilova 1969, Guéorguiev & Bunalski 2004), as well as original data from newly collected material from the park and the mountain (denoted as “New data” in the list). Literature data in which the species localities are not precisely indicated (e.g. ”Vratsa”, “Mezdra”, “Lakatnik”) are not included in the list. New material

has been collected from April to October 2014 at the Beglichki Part of Vrachanska Planina Mts. and the Lakatnishki Skali Place (both in UTM FN97) mainly by manual collecting and by soil excavations. All specimens were collected by Denis Gradinarov. All new localities at Vrachanska Planina Mts. are within NATURA 2000 ecological network (site "Vrachanski Balkan", BG0002053). The classification of Scarabaeoidea is according to the Catalogue of Palaearctic Coleoptera (Löbl & Smetana 2006).

The material used in the study is deposited in the collection of Department of Zoology and Anthropology, Faculty of Biology, Sofia University "St. Kliment Ohridski".

The abbreviations used in the list of species are as follow: * - species new for the investigated region; VM - Vrachanska Planina Mountain; LS - Lakatnishki Skali Place; VBP - Vrachanski Balkan Nature Park.

List of species

Superfamily Scarabaeoidea Latreille, 1802

Family Lucanidae Latreille, 1804

Subfamily Dorcinae Parry, 1864

Genus *Dorcus* MacLeay, 1819

***Dorcus parallelipipedus* (Linnaeus, 1758)**

New data: LS, VBP, 43°05.40'N; 23°22.92'E, 590 m, 25.06.2014, 1 ♀, on tourist trail.

Notes: LS, VBP. First record for Lakatnishki Skali Place.

Family Trogidae MacLeay, 1819

Genus *Trox* Fabricius, 1775

***Trox niger* P. Rossi, 1792**

Literature data: VM, VBP, Okolchitsa Chalet, 1045 m (Guéorguiev & Bunalski 2004: 259 as *Trox hispidus* (Pontoppidan, 1763)).

Notes: VM, VBP.

Family Geotrupidae Latreille, 1802

Subfamily Geotrupinae Latreille, 1802

Tribe Geotrupini Latreille, 1802

Genus *Geotrupes* Latreille, 1797

***Geotrupes* (*Geotrupes*) *spiniger* (Marsham, 1802)**

Literature data: VM, Parshevitsa Chalet (Zacharieva-Stoilova 1969: 18).

Notes: VM, VBP.

***Geotrupes* (*Geotrupes*) *stercorarius* (Linnaeus, 1758)**

Literature data: VM, VBP, Parshevitsa Chalet (Zacharieva-Stoilova 1969: 18); *VM,* VBP, Uchitelski Kolonii Place (Zacharieva-Stoilova 1969: 18, locality is denoted as "Uchitelskata Stancia").

Notes: VM, VBP.

Genus *Thorectes* Mulsant, 1842

***Thorectes punctulatus* (Jekel, 1866)**

Literature data: VM, VBP, Parshevitsa Chalet (Zacharieva-Stoilova 1969: 19 as *Geotrupes intermedius* after Guéorguiev & Bunalski 2004*)*; VM, VBP, Okolchitsa Chalet, 850-900 m (Guéorguiev & Bunalski 2004: 259 as *Jekelius punctulatus*).

Notes: VM, VBP.

Genus *Trypocopris* Motschulsky, 1860

****Trypocopris* (*Trypocopris*) *vernalis* (Linnaeus, 1758)**

New data: LS, VBP, 43°05.33'N; 23°22.95'E, 450 m, 23.04.2014, 1 ♀, in excr.; VM, VBP, above Milanovo Vill., 43°07.59'N; 23°23.49'E, 970 m, 11.05.2014, 2 ♂♂, in sheep excr.; VM, VBP, above Milanovo Vill., 43°07.63'N; 23°23.45'E, 980 m, 11.05.2014, 1 ♂, in sheep excr.; VM, VBP, above Milanovo Vill., 43°07.64'N; 23°23.40'E, 990 m, 11.05.2014, 1 ♀, in sheep excr.; VM, VBP, above Milanovo Vill., 43°08.11'N; 23°23.50'E, 1000 m, 07.06.2014, 1 ♀, in sheep excr.; VM, VBP, above Milanovo Vill., 43°08.20'N; 23°23.92'E, 1030 m, 25.06.2014, 1 ♀, in sheep excr.; VM, VBP, above Lakatnik Railway Station, 43°05.48'N; 23°23.94'E, 470 m, 26.07.2014, 1 ♀, on the road.

Notes: VM, LS, VBP. First record for Vrachanska Planina Mts. and Lakatnishki Skali Place.

Family Scarabaeidae Latreille, 1802

Subfamily Aphodiinae Leach, 1815

Tribe Aphodiini Leach, 1815

Genus *Aphodius* Illiger, 1798

****Aphodius* (*Acrossus*) *luridus* (Fabricius, 1775)**

New data: VM, Milanovo Vill., 43°06.80'N; 23°23.75'E, 815 m, 11.05.2014, 2 ♂♂, 2 ♀♀, in sheep excr.; VM, Milanovo Vill., 43°07.27'N; 23°23.74'E, 890 m, 11.05.2014, 1 ♂, in sheep excr.; VM, VBP, above Milanovo Vill., 43°07.51'N; 23°23.54'E, 960 m, 11.05.2014, 1 ♀, in sheep excr.; VM, VBP, above Milanovo Vill., 43°07.64'N; 23°23.40'E, 990 m, 11.05.2014, 1 ♂, 1 ♀, in sheep excr.

Notes: VM, VBP. Common and widely distributed species. First record for Vrachanska Planina Mts.

***Aphodius* (*Acrossus*) *rufipes* (Linnaeus, 1758)**

Literature data: VM, VBP, Parshevitsa Chalet (Zacharieva-Stoilova 1969: 20).

Notes: VM, VBP.

***Aphodius* (*Agoliinus*) *satyrus* Reitter, 1892**

Literature data: VM, VBP, Parshevitsa Chalet (Zacharieva-Stoilova 1969: 22 as *Aph.* (*Agrilinus*) *constans* Duftschmidt (misidentified)).

Notes: VM, VBP. The species *Aph.* (*Agrilinus*) *constans* is noted for Bulgaria as a result of "wrong identification" and was excluded from the list for the country, as the data of Zaharieva-Stoilova (1969) concerns *Aph. satyrus* (Bunalski 2001b).

***Aphodius* (*Agrilinus*) *ater* (DeGeer, 1774)**

New data: VM, VBP, above Lakatnik Railway Station, 43°05.38'N; 23°24.15'E, 500 m, 25.07.2014, 1 ♀, in goat excr.

Notes: VM, VBP. The species was reported for the Middle and East Stara Planina Mts. (Zacharieva-Stoilova 1974: 132). However, it was not listed for Bulgaria in the Catalogue of Palaearctic Coleoptera (Löbl & Smetana 2006). First record for Vrachanska Planina Mts.

***Aphodius* (*Amidorus*) *obscurus* (Fabricius, 1792)**

Literature data: VM, VBP, Parshevitsa Chalet (Zacharieva-Stoilova 1969: 22).

Notes: VM, VBP. One of the mountain species in Bulgaria, common above the tree line of the mountains.

***Aphodius* (*Ammoecius*) *brevis* Erichson, 1848**

New data: VM, Milanovo Vill., 43°07.17'N; 23°23.80'E, 860 m, 11.05.2014, 1 ♀, in cattle excr.

Notes: VM. Reported for Bulgaria by Král & Malý (1993) from Rodopi Mts. (Mostovo Vill.). First record for Stara Planina Mts. and second record for Bulgaria.

***Aphodius* (*Aphodius*) *fimetarius* (Linnaeus, 1758)**

New data: VM, Milanovo Vill., 43°07.17'N; 23°23.80'E, 860 m, 23.04.2014, 1 ♂, in cattle excr.; the same locality, 11.05.2014, 1 ♂, 2 ♀♀, in cattle excr.; VM, VBP, above Milanovo Vill., 43°07.64'N; 23°23.44'E, 980 m, 07.06.2014, 3 ♀♀, in sheep excr.; VM, VBP, above Milanovo Vill., 43°08.11'N; 23°23.50'E, 1000 m, 07.06.2014, 1 ♀, in sheep excr.; VM, VBP, above Milanovo Vill., 43°08.09'N; 23°23.44'E, 1000 m, 25.06.2014, 1 ♂, in sheep excr.; VM, Milanovo Vill., below Mogilata Peak, 43°06.46'N; 23°23.91'E, 815 m, 19.10.2014, 1 ♂, 1 ♀, in sheep excr.; VM, Milanovo Vill., 43°06.24'N; 23°24.04'E, 800 m, 19.10.2014, 3 ♂♂, 2 ♀♀, in cattle excr.

Notes: VM, VBP. First record for Vrachanska Planina Mts.

***Aphodius* (*Colobopterus*) *erraticus* (Linnaeus, 1758)**

New data: VM, Milanovo Vill., 43°06.80'N; 23°23.75'E, 815 m, 11.05.2014, 1 ♂, 1 ♀, in sheep excr.; VM, VBP, above Milanovo Vill., 43°08.11'N; 23°23.50'E, 1000 m, 07.06.2014, 1 ♀, in sheep excr.; VM, Milanovo Vill., 43°06.83'N; 23°23.77'E, 810 m, 25.06.2014, 1 ♂, in cattle excr.; VM, VBP, above Milanovo Vill., 43°07.71'N; 23°23.31'E, 980 m, 25.06.2014, 1 ♀, in sheep excr.; VM, VBP, above Milanovo Vill., 43°07.95'N; 23°23.22'E, 990 m, 25.06.2014, 1 ♂, in sheep excr.; VM, VBP, above Lakatnik Railway Station, 43°05.38'N; 23°24.15'E, 500 m, 26.07.2014, 1 ♂, in goat excr.

Notes: VM, VBP. First record for Vrachanska Planina Mts.

***Aphodius* (*Esymus*) *pusillus pusillus* (Herbst, 1789)**

New data: VM, VBP, road between Lakatnik and Milanovo Vill., 43°06.00'N; 23°23.77'E, 650 m, 23.04.2014, 1 ♀, in donkey excr.; VM, Milanovo Vill., 43°07.17'N; 23°23.80'E, 860 m, 23.04.2014, 1 ♂, in cattle excr.; VM, Milanovo Vill., 43°06.80'N; 23°23.75'E, 815 m, 11.05.2014, 4 ♂♂, 1 ♀, in sheep excr.; VM, VBP, above Milanovo Vill., 43°07.59'N; 23°23.49'E, 970 m, 11.05.2014, 1 ♂, in sheep excr.; VM, VBP, above Milanovo Vill., 43°07.64'N; 23°23.44'E, 980 m, 07.06.2014, 1 ♂, 3 ♀♀, in sheep excr.; VM, VBP, above

Milanovo Vill., 43°08.11'N; 23°23.50'E, 1000 m, 07.06.2014, 4 ♂♂, 1 ♀, in sheep excr.; VM, VBP, above Milanovo Vill., 43°07.95'N; 23°23.22'E, 990 m, 25.06.2014, 1 ♂, in sheep excr.

Notes: VM, VBP. Bunalski (2001a) cited this species from Tsarevo Town as new for Bulgaria, but in fact it was reported previously by Mikšić (1953) and Genov & Bily (1980). However it is not listed in the Catalogue of Palaearctic Coleoptera (Löbl & Smetana 2006) for Bulgaria. The most recent citation of this species is from Western Rodopi Mts. (Guéorguiev et al. 2011: 245). First record for Stara Planina Mts.

******Aphodius* **(*****Euorodalus*****)** ***paracoenosus*** **Balthasar & Hrubant, 1960**

New data: VM, Milanovo Vill., 43°07.17'N; 23°23.80'E, 860 m, 23.04.2014, 2 ♂♂, in cattle excr.; VM, Milanovo Vill., 43°06.80'N; 23°23.75'E, 815 m, 11.05.2014, 1 ♂, 1 ♀, in sheep excr.; VM, VBP, above Milanovo Vill., 43°07.51'N; 23°23.54'E, 960 m, 11.05.2014, 1 ♂, in sheep excr.; VM, Milanovo Vill., 43°06.72'N; 23°23.75'E, 830 m, 25.06.2014, 2 ♂♂, 2 ♀♀, in goat excr.; VM, VBP, above Milanovo Vill., 43°07.71'N; 23°23.31'E, 980 m, 25.06.2014, 1 ♂, in sheep excr.; VM, VBP, above Milanovo Vill., 43°08.09'N; 23°23.44'E, 1000 m, 25.06.2014, 1 ♂, 3 ♀♀, in sheep excr.

Notes: VM, VBP. According to Král & Malý (1993) this species is common for Bulgaria during the spring, an observation confirmed by followed studies (Gueorguiev et al. 2011). All records for *Aph. coenosus* (Panzer, 1798) from Bulgaria probably concern this species (Král & Malý 1993), however both species are listed in the Catalogue of Palaearctic Coleoptera (Löbl & Smetana 2006) for Bulgaria. First record for Stara Planina Mts.

******Aphodius* **(*****Limarus*****)** ***maculatus*** **Sturm, 1800**

New data: VM, VBP, above Milanovo Vill., 43°08.09'N; 23°23.44'E, 1000 m, 25.06.2014, 1 ♂, 1 ♀, in sheep excr.

Notes: VM, VBP. Known for Bulgaria by several sources (Král & Malý 1993: 23, Bunalski, 2000: 88, Guéorguiev et al. 2011: 245). The only record for Stara Planina Mts. is from Byala Vill., near Sliven Town (Bunalski 2000: 88). First record for Vrachanska Planina Mts.

******Aphodius* **(*****Melinopterus*****)** ***consputus*** **Creutzer, 1799**

New data: VM, Milanovo Vill., 43°07.17'N; 23°23.80'E, 860 m, 23.04.2014, 1 ♂, 1 ♀, in cattle excr.; VM, Milanovo Vill., below Mogilata Peak, 43°06.46'N; 23°23.91'E, 815 m, 19.10.2014, 1 ♂, 7 ♀♀, in goat and sheep excr.

Notes: VM. First record for Vrachanska Planina Mts.

******Aphodius* **(*****Melinopterus*****)** ***prodromus*** **(Brahm, 1790)**

New data: VM, Milanovo Vill., 43°07.17'N; 23°23.80'E, 860 m, 23.04.2014, 11 ♂♂, 2 ♀♀, in cattle excr.; the same locality and date, 11 ♂♂, 4 ♀♀, in donkey excr.; VM, Milanovo Vill., below Mogilata Peak, 43°06.46'N; 23°23.91'E, 815 m, 19.10.2014, 6 ♀♀, in sheep excr.

Notes: VM. First record for Vrachanska Planina Mts.

******Aphodius* **(*****Nialus*****)** ***varians*** **Duftschmid, 1805**

New data: VM, Milanovo Vill., 43°07.17'N; 23°23.80'E, 860 m, 23.04.2014, 1 ♂, in cattle excr.; VM, Milanovo Vill., 43°06.80'N; 23°23.75'E, 815 m, 11.05.2014, 2 ♂♂, 1 ♀, in sheep excr.; VM, Milanovo Vill., 43°06.83'N; 23°23.77'E, 810 m, 25.06.2014, 1 ♂, in cattle

excr.

Notes: VM. First record for Vrachanska Planina Mts.

***Aphodius* (*Nimbus*) *contaminatus* (Herbst, 1783)**

New data: VM, Milanovo Vill., below Mogilata Peak, 43°06.46'N; 23°23.91'E, 815 m, 28.09.2014, 1 ♂, in goat excr.; the same locality, 19.10.2014, 1 ♀, in goat and sheep excr.

Notes: VM. Known from Rila (Hubenov et al. 2000) without exact locality and Western Rodopi Mts. (Guéorguiev et al. 2011). First record for Stara Planina Mts.

***Aphodius* (*Nimbus*) *obliteratus* Sturm, 1823**

New data: VM, Milanovo Vill., below Mogilata Peak, 43°06.46'N; 23°23.91'E, 815 m, 19.10.2014, 9 ♂♂, 13 ♀♀, in goat and sheep excr.; the same locality and date, 11 ♂♂, 6 ♀♀, in sheep excr.

Notes: VM. First record for Vrachanska Planina Mts.

***Aphodius* (*Otophorus*) *haemorrhoidalis* (Linnaeus, 1758)**

New data: VM, Milanovo Vill., 43°07.17'N; 23°23.80'E, 860 m, 11.05.2014, 1 ♀, in cattle excr.

Notes: VM. First record for Vrachanska Planina Mts.

***Aphodius* (*Phalacronothus*) *biguttatus* Germar, 1824**

New data: VM, VBP, above Milanovo Vill., 43°07.64'N; 23°23.40'E, 990 m, 11.05.2014, 1 ♂, in sheep excr.

Notes: VM, VBP. First record for Vrachanska Planina Mts.

***Aphodius* (*Plagiogonus*) *arenarius* (A. G. Olivier, 1789)**

New data: VM, VBP, above Milanovo Vill., 43°07.64'N; 23°23.44'E, 980 m, 07.06.2014, 3 ♂♂, 5 ♀♀, in sheep excr.; VM, VBP, above Lakatnik Railway Station, 43°05.36'N; 23°24.00'E, 440 m, 25.07.2014, 1 ♀, in goat excr.; the same locality, 26.07.2014, 1 ♀, in goat excr.

Notes: VM, VBP. Cited for the country by Angelov (1965) as *Aph. putridus* (Geoffroy), Král & Malý (1993) as *Aph. putridus* (Fourcroy) and Bunalski (2001a: 30). However, it was not listed for Bulgaria in the Catalogue of Palaearctic Coleoptera (Löbl & Smetana 2006). First record for Stara Planina Mts.

***Aphodius* (*Teuchestes*) *fossor* (Linnaeus, 1758)**

New data: VM, Milanovo Vill., 43°06.80'N; 23°23.75'E, 815 m, 11.05.2014, 1 ♂, in sheep excr.; VM, Milanovo Vill., 43°07.17'N; 23°23.80'E, 860 m, 11.05.2014, 1 ♂, in cattle excr.

Notes: VM. Widely distributed, mainly in mountainous and forested areas in the country. First record for Vrachanska Planina Mts.

***Aphodius* (*Trichonotulus*) *scrofa* (Fabricius, 1787)**

New data: VM, VBP, above Milanovo Vill., 43°07.64'N; 23°23.40'E, 990 m, 11.05.2014, 1 ♂, 1 ♀, in sheep excr.

Notes: VM, VBP. First record for Vrachanska Planina Mts.

***Aphodius* (*Volinus*) *sticticus* (Panzer, 1798)**

New data: VM, VBP, above Milanovo Vill., 43°07.64'N; 23°23.44'E, 980 m, 07.06.2014, 12 ♂♂, 6 ♀♀, in sheep excr.; VM, VBP, above Milanovo Vill., 43°08.09'N; 23°23.44'E, 1000 m, 25.06.2014, 1 ♂, 2 ♀♀, in sheep excr.

Notes: VM, VBP. Common species for the mountain dung beetle fauna. First record for Vrachanska Planina Mts.

Genus *Oxyomus* Dejean, 1833

***Oxyomus sylvestris* (Scopoli, 1763)**

New data: VM, Milanovo Vill., 43°07.17'N; 23°23.80'E, 860 m, 23.04.2014, 2 ♂♂, 2 ♀♀, in cattle excr.; the same locality and date, 4 ♂♂, 3 ♀♀, in donkey excr.; VM, VBP, above Lakatnik Railway Station, 43°05.36'N; 23°24.00'E, 440 m, 25.07.2014, 1 ♂, 1 ♀, in goat excr.

Notes: VM, VBP. Common species for forest habitats. First record for Vrachanska Planina Mts.

Subfamily Scarabaeinae Latreille, 1802

Tribe Coprini Leach, 1815

Genus *Copris* Geoffroy, 1762

***Copris* (*Copris*) *lunaris* (Linnaeus, 1758)**

New data: VM, VBP, above Milanovo Vill., 43°07.64'N; 23°23.40'E, 990 m, 11.05.2014, 1 ♂, 1 ♀, under sheep excr.; VM, VBP, above Milanovo Vill., 43°07.59'N; 23°23.49'E, 970 m, 11.05.2014, 1 ♂, under sheep excr.; VM, VBP, above Milanovo Vill., 43°07.64›N; 23°23.44›E, 980 m, 07.06.2014, 2 ♂♂, under sheep excr.; VM, VBP, above Milanovo Vill., 43°07.95'N; 23°23.22'E, 990 m, 25.06.2014, 1 ♂, under sheep excr.

Notes: VM, VBP. First record for Vrachanska Planina Mts.

Tribe Gymnopleurini Lacordaire, 1856

Genus *Gymnopleurus* Illiger, 1803

***Gymnopleurus geoffroyi geoffroyi* (Fuessly, 1775)**

Literature data: VM, VBP, Parshevitsa Chalet (Zacharieva-Stoilova 1969: 8 as *Gymnopleurus* (s. str.) *geoffroyi*).

Notes: VM, VBP.

***Gymnopleurus mopsus mopsus* (Pallas, 1781)**

Literature data: VM, VBP, Parshevitsa Chalet, 1100 m (Zacharieva-Stoilova 1969: 7 as *Gymnopleurus* (s. str.) *mopsus*).

Notes: VM, VBP.

Tribe Oniticellini H. J. Kolbe, 1905

Genus *Euoniticellus* A. Janssens, 1953

******Euoniticellus fulvus* **(Goeze, 1777)**

New data: VM, VBP, above Milanovo Vill., 43°07.64'N; 23°23.40'E, 990 m, 11.05.2014, 1 ♂, in sheep excr.; VM, VBP, above Milanovo Vill., 43°07.71'N; 23°23.31'E, 980 m, 25.06.2014, 2 ♂♂, 1 ♀, in sheep excr.; VM, VBP, above Milanovo Vill., 43°07.95'N; 23°23.22'E, 990 m, 25.06.2014, 1 ♀, in sheep excr.; VM, VBP, above Lakatnik Railway Station, 43°05.36'N; 23°24.00'E, 440 m, 25.07.2014, 1 ♂, in goat excr.

Notes: VM, VBP. Common for the country species. First record for Vrachanska Planina Mts.

Tribe Onthophagini Burmeister, 1846

Genus *Euonthophagus* Balthasar, 1959

Euonthophagus gibbosus (Scriba, 1790)

Literature data: VM, VBP, Parshevitsa Chalet (Zacharieva-Stoilova 1969: 12 as *Onthophagus gibbosus*).

Notes: VM, VBP.

Genus *Onthophagus* Latreille, 1802

******Onthophagus* **(*Furconthophagus*)** ***furcatus* (Fabricius, 1781)**

New data: VM, Milanovo Vill., 43°06.72'N; 23°23.75'E, 830 m, 07.06.2014, 3 ♂♂, 1 ♀, in goat excr.; the same locality, 25.06.2014, 2 ♂♂, 1 ♀, in goat excr.; VM, VBP, above Milanovo Vill., 43°08.20'N; 23°23.92'E, 1030 m, 25.06.2014, 1 ♀, in sheep excr.

Notes: VM, VBP. Common for the country species. First record for Vrachanska Planina Mts.

******Onthophagus* **(*Onthophagus*)** ***illyricus* (Scopoli, 1763)**

New data: VM, Milanovo Vill., 43°06.80'N; 23°23.75'E, 815 m, 11.05.2014, 2 ♂♂, 4 ♀♀, in sheep excr.; VM, VBP, above Milanovo Vill., 43°07.59'N; 23°23.49'E, 970 m, 11.05.2014, 1 ♂, in sheep excr.; VM, VBP, above Milanovo Vill., 43°08.11'N; 23°23.50'E, 1000 m, 07.06.2014, 1 ♀, in sheep excr.; VM, Milanovo Vill., 43°06.83'N; 23°23.77'E, 810 m, 25.06.2014, 1 ♀, in cattle excr.; VM, Milanovo Vill., 43°06.72'N; 23°23.75'E, 830 m, 25.06.2014, 1 ♂, 1 ♀, in goat excr.; VM, VBP, above Milanovo Vill., 43°07.71'N; 23°23.31'E, 980 m, 25.06.2014, 3 ♂♂, 1 ♀, in sheep excr.; VM, VBP, above Milanovo Vill., 43°07.95'N; 23°23.22'E, 990 m, 25.06.2014, 1 ♂, in sheep excr.; VM, VBP, above Milanovo Vill., 43°08.20'N; 23°23.92'E, 1030 m, 25.06.2014, 1 ♂, 1 ♀, in sheep excr.; VM, VBP, above Lakatnik Railway Station, 43°05.36'N; 23°24.00'E, 440 m, 26.07.2014, 1 ♀, in goat excr.; VM, Milanovo Vill., below Mogilata Peak, 43°06.38'N; 23°24.08'E, 800 m, 28.09.2014, 1 ♂, 1 ♀, in sheep excr.; VM, Milanovo Vill., below Mogilata Peak, 43°06.27'N; 23°24.24'E, 810 m, 28.09.2014, 1 ♂, 1 ♀, in sheep excr.; VM, Milanovo Vill., below Mogilata Peak, 43°06.46'N; 23°23.91'E, 815 m, 28.09.2014, 1 ♂, 2 ♀♀, in goat excr.; the same locality and date, 4 ♂♂, 4 ♀♀, in sheep excr.; the same locality, 19.10.2014, 2 ♂♂, in sheep excr.

Notes: VM, VBP. First record for Vrachanska Planina Mts.

***Onthophagus* (*Onthophagus*) *taurus* (Schreber, 1759)**

Literature data: VM, VBP, Parshevitsa Chalet (Zacharieva-Stoilova 1969: 12, Zacharieva-Stoilova 1969: 13 as *Onthophagus taurus* ab. *fuscipenis*, *Onthophagus taurus* ab. *alternatus*).

New data: VM, near Milanovo Vill., 43°06.83'N; 23°23.77'E, 810 m, 25.06.2014, 1 ♂, 2 ♀♀, in cattle excr.; VM, VBP, above Milanovo Vill., 43°07.95'N; 23°23.22'E, 990 m, 25.06.2014, 1 ♂, in sheep excr.

Notes: VM, VBP.

****Onthophagus* (*Palaeonthophagus*) *coenobita* (Herbst, 1783)**

New data: VM, Milanovo Vill., 43°07.17'N; 23°23.80'E, 860 m, 23.04.2014, 3 ♂♂, 5 ♀♀, in cattle excr.; VM, Milanovo Vill., 43°06.80'N; 23°23.75'E, 815 m, 11.05.2014, 1 ♂, 1 ♀, in sheep excr.;

Notes: VM. Common species in forested areas. First record for Vrachanska Planina Mts.

****Onthophagus* (*Palaeonthophagus*) *fracticornis* (Preyssler, 1790)**

New data: VM, Milanovo Vill., 43°07.17'N; 23°23.80'E, 860 m, 23.04.2014, 3 ♂♂, 4 ♀♀, in cattle excr.; the same locality and date, 2 ♂♂, 2 ♀♀, in donkey excr.; VM, Milanovo Vill., 43°06.80'N; 23°23.75'E, 815 m, 11.05.2014, 3 ♂♂, 2 ♀♀, in sheep excr.; VM, VBP, above Milanovo Vill., 43°07.64'N; 23°23.44'E, 980 m, 07.06.2014, 1 ♂, in sheep excr.; VM, VBP, above Lakatnik Railway Station, 43°05.38'N; 23°24.15'E, 500 m, 25.07.2014, 1 ♂, in goat excr.; VM, Milanovo Vill., below Mogilata Peak, 43°06.38'N; 23°24.08'E, 800 m, 28.09.2014, 3 ♂♂, 3 ♀♀, in sheep excr.; VM, Milanovo Vill., below Mogilata Peak, 43°06.27'N; 23°24.24'E, 810 m, 28.09.2014, 9 ♂♂, 2 ♀♀, in sheep excr.; VM, Milanovo Vill., below Mogilata Peak, 43°06.46'N; 23°23.91'E, 815 m, 28.09.2014, 4 ♂♂, 4 ♀♀, in goat excr.; the same locality and date, 4 ♂♂, 6 ♀♀, in sheep excr.; the same locality, 19.10.2014, 3 ♂♂, 2 ♀♀, in goat and sheep excr.; the same locality and date, 6 ♂♂, 3 ♀♀, in sheep excr.

Notes: VM, VBP. First record for Vrachanska Planina Mts.

***Onthophagus* (*Palaeonthophagus*) *joannae* Goljan, 1953**

Literature data: VM, VBP, Parshevitsa Chalet (Zacharieva-Stoilova 1969: 14).

Notes: VM, VBP.

***Onthophagus* (*Palaeonthophagus*) *lemur* (Fabricius, 1781)**

Literature data: VM, VBP, Parshevitsa Chalet (Zacharieva-Stoilova, 1969: 17).

New data: VM, VBP, road between Lakatnik and Milanovo Vill., 43°06.00'N; 23°23.77'E, 650 m, 23.04.2014, 2 ♂♂, 1 ♀, in donkey excr.; VM, Milanovo Vill., 43°07.17'N; 23°23.80'E, 860 m, 23.04.2014, 2 ♂♂, in cattle excr.; VM, Milanovo Vill., 43°06.80'N; 23°23.75'E, 815 m, 11.05.2014, 2 ♂♂, 4 ♀♀, in sheep excr.; VM, VBP, above Milanovo Vill., 43°07.59'N; 23°23.49'E, 970 m, 11.05.2014, 1 ♀, in sheep excr.; VM, VBP, above Milanovo Vill., 43°07.64'N; 23°23.40'E, 990 m, 11.05.2014, 1 ♂, in sheep excr.; VM, VBP, above Milanovo Vill., 43°07.64'N; 23°23.44'E, 980 m, 07.06.2014, 1 ♂, 2 ♀♀, in sheep excr.; VM, Milanovo Vill., 43°06.83'N; 23°23.77'E, 810 m, 25.06.2014, 1 ♂, in cattle excr.; VM, Milanovo Vill., 43°06.72'N; 23°23.75'E, 830 m, 25.06.2014, 2 ♀♀, in goat excr.; VM, VBP, above Milanovo Vill., 43°07.71'N; 23°23.31'E, 980 m, 25.06.2014, 1 ♀, in sheep excr.; above

Lakatnik Railway Station, 43°05.36'N; 23°24.00'E, 440 m, 26.07.2014, 1 ♀, in goat excr.

Notes: VM, VBP.

***Onthophagus* (*Palaeonthophagus*) *marginalis* (Gebler, 1817)**

Literature data: VM, VBP, Uchitelski Kolonii Place (Zacharieva-Stoilova 1969: 16, locality is denoted as Uchitelskata Stancia).

Notes: VM, VBP.

***Onthophagus* (*Palaeonthophagus*) *ruficapillus* Brullé, 1832**

Literature data: VM, VBP, Zgorigrad Vill., Ledenika Cave vicinity (Goljan 1953: 64); VM, VBP, Parshevitsa Chalet (Zacharieva-Stoilova 1969: 14 as *Onthophagus* (s. str.) *ruficapilus*).

New data: VM, Milanovo Vill., 43°07.17'N; 23°23.80'E, 860 m, 23.04.2014, 1 ♂, in cattle excr.; VM, VBP, above Milanovo Vill., 43°07.64'N; 23°23.40'E, 990 m, 11.05.2014, 2 ♂♂, in sheep excr.; VM, VBP, above Milanovo Vill., 43°08.11'N; 23°23.50'E, 1000 m, 07.06.2014, 1 ♂, 3 ♀♀, in sheep excr.; VM, Milanovo Vill., 43°06.72'N; 23°23.75'E, 830 m, 25.06.2014, 3 ♂♂, 1 ♀, in goat excr.; VM, VBP, above Milanovo Vill., 43°07.71'N; 23°23.31'E, 980 m, 25.06.2014, 1 ♂, 3 ♀♀, in sheep excr.; VM, VBP, above Milanovo Vill., 43°07.95'N; 23°23.22'E, 990 m, 25.06.2014, 2 ♂♂, in sheep excr.; VM, VBP, above Milanovo Vill., 43°08.20'N; 23°23.92'E, 1030 m, 25.06.2014, 1 ♀, in sheep excr.; VM, VBP, above Milanovo Vill., 43°08.20'N; 23°23.98'E, 1035 m, 25.06.2014, 1 ♀, in sheep excr.; VM, Milanovo Vill., below Mogilata Peak, 43°06.46'N; 23°23.91'E, 815 m, 28.09.2014, 1 ♀, in goat excr.

Notes: VM, VBP.

***Onthophagus* (*Palaeonthophagus*) *similis* (Scriba, 1790)**

Literature data: VM, VBP, Parshevitsa Chalet (Zacharieva-Stoilova 1969: 16 as *Onthophagus* (s. str.) *similis*).

New data: VM, Milanovo Vill., 43°06.80'N; 23°23.75'E, 815 m, 11.05.2014, 1 ♂, in sheep excr.

Notes: VM, VBP.

******Onthophagus* (*Palaeonthophagus*) *vacca* (Linnaeus, 1767)**

New data: VM, Milanovo Vill., 43°07.17'N; 23°23.80'E, 860 m, 23.04.2014, 1 ♂, 1 ♀, in cattle excr.; VM, VBP, above Milanovo Vill., 43°07.95'N; 23°23.22'E, 990 m, 25.06.2014, 1 ♂, in sheep excr.; VM, Milanovo Vill., below Mogilata Peak, 43°06.46'N; 23°23.91'E, 815 m, 28.09.2014, 1 ♂, in sheep excr.

Notes: VM, VBP. First record for Vrachanska Planina Mts.

******Onthophagus* (*Palaeonthophagus*) *verticicornis* (Laicharting, 1781)**

New data: VM, VBP, roar between Lakatnik and Milanovo Vill., 43°06.00'N; 23°23.77'E, 650 m, 23.04.2014, 1 ♂, 1 ♀, in donkey excr.; VM, Milanovo Vill., 43°07.17'N; 23°23.80'E, 860 m, 23.04.2014, 45 ♂♂, 39 ♀♀, in cattle excr.; the same locality and date, 2 ♂♂, in donkey excr.; VM, Milanovo Vill., 43°06.80'N; 23°23.75'E, 815 m, 11.05.2014, 3 ♂♂, 1 ♀, in sheep excr.; VM, VBP, above Milanovo Vill., 43°07.51'N; 23°23.54'E, 960 m, 11.05.2014, 1 ♂, 1 ♀, in sheep excr.; VM, VBP, above Milanovo Vill., 43°07.59'N; 23°23.49'E, 970 m, 11.05.2014, 6 ♂♂, 9 ♀♀, in sheep excr.; VM, VBP, above Milanovo Vill., 43°07.64'N; 23°23.40'E, 990

m, 11.05.2014, 11 ♂♂, 10 ♀♀, in sheep excr.; VM, VBP, above Milanovo Vill., 43°07.64'N; 23°23.44'E, 980 m, 07.06.2014, 7 ♂♂, 5 ♀♀, in sheep excr.; VM, VBP, above Milanovo Vill., 43°08.11'N; 23°23.50'E, 1000 m, 07.06.2014, 3 ♀♀, in sheep excr.; VM, Milanovo Vill., 43°06.72'N; 23°23.75'E, 830 m, 25.06.2014, 1 ♂, 1 ♀, in goat excr.; VM, VBP, above Milanovo Vill., 43°07.71'N; 23°23.31'E, 980 m, 25.06.2014, 1 ♂, in sheep excr.; VM, VBP, above Milanovo Vill., 43°08.09'N; 23°23.44'E, 1000 m, 25.06.2014, 1 ♂, in sheep excr.; VM, VBP, above Milanovo Vill., 43°08.20'N; 23°23.92'E, 1030 m, 25.06.2014, 4 ♂♂, 11 ♀♀, in sheep excr.; VM, VBP, above Milanovo Vill., 43°08.20'N; 23°23.98'E, 1035 m, 25.06.2014, 1 ♂, 7 ♀♀, in sheep excr.; VM, VBP, above Lakatnik Railway Station, 43°05.38'N; 23°24.15'E, 500 m, 26.07.2014, 1 ♀, in goat excr.

Notes: VM, VBP. First record for Vrachanska Planina Mts.

Tribe Sisyphini Mulsant, 1842

Genus *Sisyphus* Latreille, 1807

***Sisyphus schaefferi schaefferi* (Linnaeus, 1758)**

New data: VM, VBP, above Milanovo Vill., 43°07.33'N; 23°23.71'E, 910 m, 11.05.2014, 3 ♂♂, 2 ♀♀, in sheep excr.; VM, VBP, above Milanovo Vill., 43°07.51'N; 23°23.54'E, 960 m, 11.05.2014, 1 ♂, 1 ♀, in sheep excr.; VM, above Milanovo Vill., 43°07.59'N; 23°23.49'E, 970 m, 11.05.2014, 2 ♂♂, in sheep excr.; VM, VBP, above Milanovo Vill., 43°07.55'N; 23°23.42'E, 950 m, 07.06.2014, 1 ♂, 1 ♀, rolling behavior obs.; VM, Milanovo Vill., 43°06.72'N; 23°23.75'E, 830 m, 25.06.2014, 1 ♀, in goat excr.; VM, VBP, above Milanovo Vill., 43°08.20'N; 23°23.98'E, 1035 m, 25.06.2014, 2 ♀♀, in sheep excr.; VM, VBP, above Lakatnik Railway Station, 43°05.38'N; 23°24.15'E, 500 m, 26.07.2014, 1 ♂, in goat excr.; VM, VBP, above Lakatnik Railway Station, 43°05.36'N; 23°24.00'E, 440 m, 26.07.2014, 1 ♂, in goat excr.

Notes: VM, VBP. First record for Vrachanska Planina Mts.

Subfamily Orphninae Erichson, 1847

Tribe Orphnini Erichson, 1847

Genus *Chaetonyx* Schaum, 1862

***Chaetonyx robustus* Schaum, 1862**

New data: VM, VBP, above Lakatnik Railway Station, coordinates in Table 1, 480 – 500 m, xerothermic oak-hornbeam forest, 25.07.2014, 19 ♂♂, 14 ♀♀, one pupa, one prepupa, eggs, larvae from all the three instars, in soil and between soil and litter; the same locality, 43°05.35'N; 23°24.15'E, 19.10.2014, 8 ♂♂, 8 ♀♀, larvae, in soil, sample 70 x 30 cm, 10 cm depth.

The locality is situated on a slope on Vrachanska Planina Mts., at ca. 200 m by the Iskar River. The soil is brown forest, with medium to high stone content, almost without grass cover. Six random soil samples (30 x 30 and 10 cm depth) were taken by an area of 200 m^2, with minimum distance of 2 m between samples (Table 1). Thus the results of the samples give at least rough example for the abundance of the local population of the species in this locality.

Notes: VM, VBP. The species was recorded from Stara Planina Mts. by Joakimov (1904) as *Chaetonix* [sic!] *robustus*), Nedelkov (1905) as *H. robustus* [sic!] and Zacharieva-

Stoilova (1974) as *Chaetonix* [sic!] *robustus*. Kral & Maly (1993) doubt the previous citations for this species for Bulgaria. The recent findings confirm the presence of this species in Stara Planina Mts.

Table 1. Abundance of *Chaetonyx robustus* in six soil samples from oak-hornbeam forest above Lakatnik Railway Station, Vrachanska Planina Mts., 25.07.2014.

Sample №	Coordinates	Males	Females	Total adults	Larvae	Pupae	Eggs
1	43°05.351'N; 23°24.158'E	1	1	2	+	1	-
2	43°05.351'N; 23°24.154'E	10	8	18	+	-	+
3	43°05.350'N; 23°24.154'E	0	3	3	+	-	+
4	43°05.355'N; 23°24.153'E	-	-	-	-	-	-
5	43°05.357'N; 23°24.144'E	7	0	7	+	-	-
6	43°05.359'N; 23°24.137'E	1	2	3	+	-	+

Subfamily Melolonthinae Samouelle, 1819

Tribe Hopliini Latreille, 1829

Genus *Hoplia* Illiger, 1803

***Hoplia* (*Hoplia*) *argentea* (Poda von Neuhaus, 1761)**

Literature data: VM, VBP, Parshevitsa Chalet (Zacharieva-Stoilova 1969: 26 as *Hoplia farinosa*).

New data: VM, VBP, road between Lakatnik Railway Station and Milanovo Vill., 43°05.38'N; 23°24.08'E, 480 m, 23.04.2014, 2 ♂♂, 1 ♀, on *Crataegus monogina* Jacq., copulation obs.; VM, VBP, above Milanovo Vill., 43°07.67'N; 23°23.38'E, 990 m, 11.05.2014, 5 ♂♂, on *Crataegus monogina* Jacq.; VM, VBP, above Milanovo Vill., 43°08.18'N; 23°23.55'E, 1010 m, meadow near beech forest, 07.06.2014, 1 ♀, at flight.

Notes: VM, VBP.

Tribe Rhizotrogini Burmeister, 1855

Genus *Amphimallon* Latreille, 1825

***Amphimallon assimile* (Herbst, 1790)**

Literature data: VM, VBP, Uchitelski Kolonii Place (Zacharieva-Stoilova 1969: 24 as *Amphimallon assimilis*, locality is denoted as Uchitelskata Stancia).

Notes: VM, VBP.

Genus *Holochelus* Reitter, 1889

****Holochelus* (*Miltotrogus*) *vernus* (Germar, 1823)**

New data: VM, on road in Milanovo Vill., 43°07.25'N; 23°23.53'E, 860 m, 07.06.2014, 1 ♀, found dead.

Notes: VM. The species was reported for the Western Stara Planina Mts. (Zacharieva-

*S*toilova 1969: 23 as *Rhizotrogus vernus vernus*) and for the Middle and Eastern Stara Planina Mts. (Zacharieva-Stoilova 1974: 134 as *Rhisotrogus* [sic!] *vernus vernus*). First record for Vrachanska Planina Mts.

Genus *Rhizotrogus* Latreille, 1825

***Rhizotrogus aestivus* (A. G. Olivier, 1789)**

New data: VM, on road below Milanovo Vill., 43°06.53'N; 23°23.46'E, 780 m, 11.05.2014, 1 ♀, found dead.

Notes: VM. The species was reported for the Western Stara Planina Mts. (Zacharieva-Stoilova 1969: 23) and for the Middle and Eastern Stara Planina Mts. (Zacharieva-Stoilova 1974: 134 as *Rhisotrogus* [sic!] *aestivus*). First record for Vrachanska Planina Mts.

Subfamily Sericinae Kirby, 1837

Tribe Sericini Kirby, 1837

Genus *Omaloplia* Schönherr, 1817

***Omaloplia* (*Omaloplia*) *illyrica* (Baraud, 1965)**

New data: LS, VBP, 43°05.44'N; 23°22.88'E, 580 m, 25.06.2014, 1 ♂, on flowers; VM, Milanovo Vill., 43°06.71'N; 23°23.73'E, 830 m, meadow, 07.06.2014, 2 ♂♂, 3 ♀♀, on flowers.

Notes: VM, LS, VBP. The species was reported from Maleshevska Planina Mts. (Guéorguiev & Ljubomirov 2009: 246). First record for Stara Planina Mts.

***Omaloplia* (*Omaloplia*) *ruricola* (Fabricius, 1775)**

Literature data: VM, VBP, Uchitelski Kolonii Place (Zacharieva-Stoilova, 1969: 23 as Homaloplia ruricola, locality is denoted as Uchitelskata Stancia).

Notes: VM, VBP.

Subfamily Rutelinae MacLeay, 1819

Tribe Anomalini Mulsant, 1842

Genus *Anisoplia* Fischer von Waldheim, 1824

***Anisoplia* (*Anisoplia*) *dispar* Erichson, 1847**

New data: VM, Milanovo Vill., 43°06.71'N; 23°23.73'E, 830 m, meadow, 25.06.2014, 2 ♂♂, on grasses.

Notes: VM. Previously known for Bulgaria only from the Black Sea Coast (Král & Malý 1993: 26). First record for Stara Planina Mts.

Genus *Chaetopteroplia* S. I. Medvedev, 1949

***Chaetopteroplia segetum balcanicola* (Machatschke, 1961)**

New data: VM, Milanovo Vill., 43°06.71'N; 23°23.73'E, 830 m, meadow, 25.06.2014, 1 ♀, on grasses.

Notes: VM. The species was reported for the Western Stara Planina Mts. (Zacharieva-Stoilova 1969: 25 as *Anisoplia segetum balcanicola)* and for the Middle and Eastern Stara Planina Mts. (Zacharieva-Stoilova 1974: 136 as *Anisoplia segetum balcanicola*). First record

for Vrachanska Planina Mts.

Genus *Blitopertha* Reitter, 1903

***Blitopertha lineolata* (Fischer von Waldheim, 1824)**

New data: VM, near Milanovo Vill., 43°06.71'N; 23°23.73'E, 830 m, meadow, 07.06.2014, 5 ♂♂, 1 ♀, on flowers of *Potentilla* sp.; the same locality, 25.06.2014, 2 ♀♀, on flowers.

Notes: VM. The species was reported for the Western Stara Planina Mts. (Zacharieva-Stoilova 1969: 25 as *Phylopertha* [sic!] (*Blitopertha*) *lineolata*) and for the Middle and Eastern Stara Planina Mts. (Zacharieva-Stoilova 1974: 135 as *Phyllopertha lineolata*). First record for Vrachanska Planina Mts.

Subfamily Cetoniinae Leach, 1815

Tribe Cetoniini Leach, 1815

Genus *Cetonia* Fabricius, 1775

***Cetonia* (*Cetonia*) *aurata aurata* (Linnaeus, 1761)**

New data: LS, VBP, 43°05.26'N; 23°22.73'E, 500 m, 23.04.2014, 4 ♂♂, on flowers of *Syringa vulgaris* L.; VM, VBP, road between Lakatnik and Milanovo Vill., 43°05.77'N; 23°23.97'E, 590 m, 23.04.2014, 2 ♂♂, on flowers of *Syringa vulgaris* L.; VM, VBP, above Milanovo Vill., 43°07.37'N; 23°23.69'E, 930 m, 11.05.2014, 1 ♂; VM, above Milanovo Vill., 43°07.42'N; 23°23.49'E, 890 m, meadow, 07.06.2014, 1 ♂, on flowers of *Filipendula vulgaris* Moench.

Notes: VM, LS, VBP. Common for the country species. First record for Vrachanska Planina Mts. and Lakatnishki Skali Place.

Genus *Protaetia* Burmeister, 1842

***Protaetia* (*Potosia*) *cuprea obscura* (Andersch, 1797)**

New data: LS, VBP, 43°05.22'N; 23°22.71'E, 500 m, 07.06.2014, 1 ♂, resting on grasses; VM, VBP, above Milanovo Vill., 43°07.37'N; 23°23.69'E, 930 m, 11.05.2014, 2 ♂♂, on trunks of *Crataegus monogina* Jacq.; VM, VBP, above Milanovo Vill., 43°07.61'N; 23°23.41'E, 980 m, 25.06.2014, 2 ♂♂, on flowers of *Rosa* sp.

Notes: VM, LS, VBP. First record for Vrachanska Planina Mts. and Lakatnishki Skali Place.

Genus *Tropinota* Mulsant, 1842

***Tropinota* (*Epicometis*) *hirta hirta* (Poda von Neuhaus, 1761)**

New data: LS, VBP, 43°05.31'N; 23°22.90'E, 460 m, 23.04.2014, 1 ♂, 1 ♀, on flowers of *Silybum marianum* (L.); LS, VBP, 43°05.26'N; 23°22.73'E, 500 m, 23.04.2014, 1 ♀, on flowers of *Syringa vulgaris* L.; VM, below Milanovo Vill., 43°06.75'N; 23°23.67'E, 800 m, meadow, 23.04.2014, 1 ♂, 2 ♀♀, on flowers of *Taraxacum officinale* Web.; VM, Milanovo Vill., 43°06.71'N; 23°23.73'E, 830 m, meadow, 07.06.2014, 2 ♂♂, 1 ♀, on flowers; VM, Milanovo Vill., 43°07.11'N; 23°23.42'E, 840 m, meadow, 07.06.2014, 1 ♀, on flowers of *Hieracium* sp.; VM, Milanovo Vill., 43°06.71'N; 23°23.73'E, 830 m, meadow, 25.06.2014, 1 ♀, on flowers;

VM, VBP, above Milanovo Vill., 43°08.15'N; 23°23.98'E, 1050 m, meadow, 25.06.2014, 1 ♂, 1 ♀, on flowers of *Hieracium* sp.

Notes: VM, LS, VBP. Common for the country species. First record for Vrachanska Planina Mts. and Lakatnishki Skali Place.

Genus *Oxythyrea* Mulsant, 1842

***Oxythyrea funesta* (Poda von Neuhaus, 1761)**

New data: LS, VBP, 43°05.31'N; 23°22.90'E, 460 m, 23.04.2014, 1 ♂, on flowers of *Silybum marianum* (L.); VM, Milanovo Vill., 43°06.88'N; 23°23.71'E, 810 m, 11.05.2014, 1 ♀, on flowers of *Spiraea* sp.; VM, above Milanovo Vill., 43°07.42'N; 23°23.49'E, 890 m, meadow, 07.06.2014, 2 ♂♂, 1 ♀, on flowers of Fabaceae; VM, above Milanovo Vill., 43°07.41'N; 23°23.50'E, 890 m, meadow, 25.06.2014, 1 ♀, on flowers; VM, Milanovo Vill., 43°06.71'N; 23°23.73'E, 830 m, meadow, 25.06.2014, 1 ♂, 1 ♀, on flowers.

Notes: VM, LS, VBP. Common for the country species. First record for Vrachanska Planina Mts. and Lakatnishki Skali Place.

Tribe Trichiini Fleming, 1821

Genus *Gnorimus* Lepeletier & Audinet-Serville, 1828

***Gnorimus nobilis nobilis* (Linnaeus, 1758)**

New data: VM, VBP, above Milanovo Vill., 43°07.57'N; 23°23.39'E, 960 m, 25.06.2014, 1 ♂, 1 ♀, on flowers of *Rosa* sp.

Notes: VM, VBP. First record for Vrachanska Planina Mts.

Genus *Trichius* Fabricius, 1775

***Trichius sexualis* Bedel, 1906**

New data: LS, VBP, 43°05.44'N; 23°22.88'E, 580 m, 25.06.2014, 1 ♀, on flowers of Apiaceaea.

Notes: LS, VBP. First record for Stara Planina Mts.

Tribe Valgini Mulsant, 1842

Genus *Valgus* Scriba, 1790

***Valgus hemipterus* (Linnaeus, 1758)**

New data: VM, Milanovo Vill., 43°06.88'N; 23°23.71'E, 810 m, 23.04.2014, 1 ♂, on the road.

Notes: VM. Common for the country species. First record for Vrachanska Planina Mts.

Discussion

A total of 64 species of Scarabaeoidea were established for the investigated area. From these, 50 species have been found in materials collected in 2014, the remaining 14 are quoted from the available literature data. Newly established for the territory of Vrachanska Planina Mts. and the Nature Park territory are 45 species. Eight of these species (*Aphodius*

brevis, *Aphodius pusillus*, *Aphodius paracoenosus*, *Aphodius contaminatus*, *Aphodius arenarius*, *Omaloplia illyrica*, *Anisoplia dispar* and *Trichius sexualis*) are reported for the first time for Stara Planina Mts., and the report of the species *Aphodius brevis* is the second for Bulgaria. Within the investigated area, 62 species of Scarabaeoidea have been found at the territory of Vrachanska Planina Mts. and eight at Lakatnishki Skali Place. The localities of 49 of all recorded species are situated within the territory of Vrachanski Balkan Nature Park.

In the Catalogue of Palaearctic Coleoptera (Löbl & Smetana 2006) 238 species and subspecies of Scarabaeoidea are listed for Bulgaria. However it is not a completed list, as species, previously reported for Bulgaria, part of which in some recent papers and checklists (Král & Malý 1993, Rössner 1997, Bunalski 2001b, Guéorguiev & Bunalski 2004 etc.) have obviously been omitted, and since the release of the Catalogue new reports have been published (Chehlarov 2009, Guéorguiev et al. 2011, Minkina et al. 2014, Ziani et al. 2015). Altogether, the available sources report about 300 species of Scarabaeoidea for Bulgaria. At the same time, it is very likely that a significant number of old records are a result of misidentification of species (Bunalski 2001b, Guéorguiev & Bunalski 2004). Therefore it is difficult to give a precise estimation of the number of Scarabaeoidea species in Bulgaria. The list herein presented is far from being exhaustive for the territory of Vrachanska Planina Mts. and Vrachanski Balkan Nature Park. However the number and characteristics of the species included suggest the richness of Scarabaeoidea fauna at the investigated area. Aditional field research, especially at Vratsa Karst Reserve, from the territory of which there are no current data, should allow an actual faunistic assessment.

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Скарабеоидни бръмбари (Coleoptera: Scarabaeoidea) от Врачанската планина и Природен парк Врачански Балкан

ЯНА ПЕТРОВА, ЕВГЕНИ ЧЕХЛАРОВ, ДЕНИС ГРАДИНАРОВ

(Резюме)

Изготвен е списък на видовете от надсемейство Scarabaeoidea за района на Врачанска Планина и територията на Природен парк Врачански Балкан. Установени са общо 64 вида от надсемейството, като 45 вида се съобщават за първи път от изследвания район. На територията на Природния парк са установени 49 вида. Видовете *Aphodius brevis, Aphodius pusillus*, *Aphodius paracoenosus*, *Aphodius contaminatus*, *Aphodius arenarius*, *Omaloplia illyrica*, *Anisoplia dispar* и *Trichius sexualis* се съобщават за първи път от Стара Планина. Видът *Aphodius brevis* се съобщава за втори път за България. Потвърдено е присъствието на *Chaetonyx robustus* в Стара Планина и са представени данни за числеността на вида в почвата на местообитанието.

Bechev, D. & Georgiev, D. (Eds.),
Faunistic diversity of Vrachanski Balkan Nature Park.
ZooNotes, Supplement 3, Plovdiv University Press,
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Leaf beetles (Coleoptera: Chrysomelidae) of Vrachanska Planina Mountains

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Abstract. Published and unpublished data about 154 species of 46 genera leaf beetles from Vrachanska Planina Mts. are summarized. 82 species are newly published to the fauna of the mountains.

Key words: Chrysomelidae, Bulgaria.

Introduction

All known Bulgarian Chrysomelidae species till 2007 were summarized by Gruev & Tomov (2007). After this synopsis there were no any active specialists on the family in Bulgaria.

Material and Methods

This paper summarizes all published data on Vrachanska Planina Mts.. New, unpublished data is on the base of materials, which were collected by D. Bechev and it is determined together with B. Gruev and V. Tomov. The nomenclature is according Gruev & Tomov (2007).

Species list

ORSODACNINAE

***Orsodacne cerasi* (Linnaeus, 1758)**

New data: Vratsa, April.

DONACIINAE

***Donacia* (*Donacia*) *bicolora* Zschach, 1788**

New data: Vratsa; May.

***Donacia* (*D.*) *dentata* Hoppe, 1795**

New data: Vratsa, July; Ledenika, July.

***Donacia* (*D.*)*marginata* Hoppe, 1795**

New data: Vratsa, July.

***Donacia* (*D.*) *simplex* Fabricius, 1775**

Tomov & Gruev (1969): Vratsa.

New data: Vratsa, April and May.

***Donacia* (*D.*) *thalassina* Germar, 1811**

New data: Vratsa, May; Ledenika, July.

***Plateumaris* (*D.*) *sericea* (Linnaeus, 1758)**

New data: Vratsa, April.

***Plateumaris* (*Juliusina*) *consimilis* (Schrank, 1781)**

Tomov & Gruev (1969): Vratsa.

New data: Vratsa, April.

CRIOCERINAE

***Oulema gallaeciana* (Heyden ,1870)**

Tomov & Gruev (1969): Vratsa.

New data: Vratsa, July.

***Oulema melanopa* (Linnaeus, 1758)**

Chorbadzhiev (1930): Vratsa.

New data: Vratsa, April; Mezdra, July; Ledenika, July and August; Parshevitsa Hut, July.

CLYTRINAE

***Labidostomis cyanicornis* Germar, 1817**

Tomov & Gruev (1969): Mezdra.

***Labidostomis longimana* (Linnaeus, 1761)**

New data: Vratsa, July; Gorna Byala Rechka, July; Milanovo, July.

***Lachnaia sexpunctata* (Scopoli, 1763)**

New data: Lakatnik, July.

***Clytra* (*Clytra*) *laeviuscula* Ratzeburg, 1837**

New data: Vratsa, July.

***Clytra* (*C.*) *quadripunctata* (Linnaeus, 1758)**

New data: Ledenika, May.

***Smaragdina* (*Monrosia*) *affinis* (Illiger, 1794)**

Nedelkov (1909): Cherepish.

***Smaragdina* (*M.*) *salicina* (Scopoli, 1763)**

Tomov & Gruev (1969): Vratsa.

New data: Lakatnik, April and May.

***Smaragdina* (*M.*) *xanthaspis* (Germar, 1824)**

New data: Vratsa, July; Matnitsa, July; Gorna Byala Rechka, July; Milanovo, July; Ledenika, July.

CRYPTOCEPHALINAE

***Cryptocephalus* (*Cryptocephalus*) *biguttatus* (Scopoli, 1763)**

Nedelkov (1909): Vratsa.

New data:Vratsa, July.

***Cryptocephalus* (*C.*) *bipunctatus* (Linnaeus, 1758)**

New data: Vratsa, May.

***Cryptocephalus* (*C.*) *flavipes* Fabricius, 1781**

Tomov & Gruev (1969): Vratsa.

New data: Vratsa, July.

***Cryptocephalus* (*C.*) *frenatus* Laicharting, 1781**

Warchalowski (1974): Ledenika.

***Cryptocephalus* (C.) *hypochoeridis* (Linnaeus, 1758)**

Warchalowski (1974) Ledenika.

New data: Vratsa, July; Gorna Byala Rechka, July; Ledenika, July.

***Cryptocephalus* (C.) *janthinus* Germar, 1824**

New data: Vratsa, July; Gorno Ozirovo, July; Matnitsa, June and July.

***Cryptocephalus* (C.) *moraei* (Linnaeus, 1758)**

Nedelkov (1909): Vratsa.

New data: Vratsa, July; Gorno Ozirovo, July; Matnitsa, July; Milanovo, July; Parshevitsa Hut, July; Ledenika, July and August.

***Cryptocephalus* (C.) *octacosmus* Bedel, 1891**

New data: Matnitsa, June and July; Vratsa, July; Gorna Byala Rechka, July; Ledenika, August.

***Cryptocephalus* (C.) *parvulus* O.F. Müller, 1776**

New data: Matnitsa, June and July; Vratsa, July.

***Cryptocephalus* (C.) *violaceus* Laicharting, 1781**

New data: Mezdra, June.

***Cryptocephalus* (C.) *vittatus* Fabricius, 1775**

Warchalowski (1974): Ledenika.

New data: Ledenika, July.

***Cryptocephalus* (*Burlinius*) *populi* Suffrian, 1848**

New data: Gorna Byala Rechka, July.

***Cryptocephalus* (*B.*) *strigosus* Germar, 1823**

Gruev (2004): Vratsa.

New data: Vratsa, July.

***Cryptocephalus* (*B.*) *connexus* Olivier, 1807**

New data: Vratsa, July; Milanovo, July.

***Pachybrachis hieroglyphicus* (Laichartig, 1781)**

New data: Gorna Byala Rechka, July.

EUMOLPINAE

***Pales ulema* (Germar, 1813)**

New data: Vratsa, April.

***Pachnephorus villosus* (Duftschmidt, 1825)**

New data: Vratsa, July; Matnitsa, August.

CHRYSOMELINAE

***Timarcha* (*Timarcha*) *tenebricosa* (Fabricius, 1775)**

New data: Vratsa, April.

***Leptinotarsa decemlineata* (Say, 1824)**

New data: Parshevitsa Hut, July.

***Chrysolina* (*Bittotaenia*) *salviae* (Germar, 1824)**

Gruev (1968): Lakatnik.

***Chrysolina* (*Ovostoma*) *olivieri* (Bedel, 1892)**

Gruev (1992): Vratsa.

New data: Vratsa, April; Matnitsa, July.

***Chrysolina* (*Menthastriella*) *herbacea* (Duftschmidt, 1825)**

New data: Vratsa, May and July; Matnitsa, June and August; Ledenika, July;

Parshevitsa Hut, July and August.

***Chrysolina* (*Synerga*) *coerulans* (Scriba, 1791)**

Tomov & Gruev (1969) Vratsa.

New data: Vratsa, April and July; Matnitsa, June and July.

***Chrysolina* (*Erythrochrysa*) *polita* (Linnaeus, 1758)**

Tomov & Gruev (1969): Vratsa.

New data: Vratsa, May; Matnitsa, June and August; Lyutadzhik, July

***Chrysolina* (*Stichoptera*) *rossia* (Illiger,1802)**

Tomov & Gruev (1969): Cherepish.

***Chrysolina* (*Hypericia*) *didymata* (Scriba, 1791)**

Warchalowski (1974): Ledenika.

***Chrysolina* (*Craspeda*) *limbata* (Fabricius, 1775)**

Warchalowski (1974): Ledenika.

New data: Vratsa, April.

***Chrysolina* (*Fastuolina*) *fastuosa* (Scopoli, 1763)**

New data: Vratsa, April and September; Parshevitsa Hut, July and August.

***Oreina* (*Oreina*) *alpestris balcanica* (Weise, 1883)**

Gruev (1990): Ledenika.

New data: Ledenika, July.

***Gastrophysa polygoni* (Linnaeus, 1758)**

New data: Vratsa, April and July.

***Phaedon* (*Phaedon*) *laevigatus* (Duftschmidt, 1825)**

New data: Mezdra, June.

***Prasocuris junci* (Brahm, 1790)**

Tomov & Gruev (1969): Vratsa.

***Plagiodera versicolora* (Laicharting, 1781)**

New data: Gorno Ozirovo, July.

***Chrysomela* (*Strickerus*) *cuprea* Fabricius, 1775**

New data: Vratsa, April.

***Chrysomela* (*Strickerus*) *vigintipunctata* (Scopoli, 1763)**

Tomov & Gruev (1969): Vratsa.

New data: Vratsa, April.

***Chrysomela* (*Pachylina*) *collaris* Linnaeus, 1758**

Nedelkov (1909): Vratsa.

***Chrysomela* (*Chrysomela*) *populi* Linnaeus, 1758**

Nedelkov (1909): Vratsa.

New data: Vratsa, April and July; Gorno Ozirovo, July.

***Chrysomela* (*Chrysomela*) *tremulae* Fabricius, 1787**

Nedelkov (1909): Vratsa.

***Gonioctena* (*Spartomena*) *fornicata* (Brüggemann, 1773)**

Chorbadzhiev (1926): Vratsa.

New data: Vratsa, April and July.

***Phratora* (*Phratora*)*laticollis* (Suffrian, 1851)**

Tomov & Gruev (1969): Vratsa.

***Phratora* (*Phratora*) *vitellinae* (Linnaeus, 1758)**

Tomov & Gruev (1969): Vratsa.

New data: Vratsa, April, July.

GALERUCINAE

***Galeruca* (*Galeruca*) *pomonae* (Scopoli, 1763)**

New data: Ledenika, July.

***Galeruca* (*G.*) *tanaceti* (Linnaeus, 1758)**

New data: Vratsa, July; Ledenika, July.

***Galeruca* (*Emarhopa*) *rufa* Germar, 1824**

New data: Vratsa, May

***Galerucella* (*Neogalerucella*) *calmariensis* (Linnaeus, 1767)**

Tomov & Gruev (1969): Vratsa.

New data: Vratsa, April; Gorno Ozirovo, July.

***Galerucella* (*Neogalerucella*) *lineola* (Fabricius, 1781)**

New data: Vratsa, April and May.

***Galerucella* (*N.*) *pusilla* (Duftschmidt, 1825)**

Tomov & Gruev (1969): Vratsa.

New data: Vratsa, April and July; Matnitsa, June;Lyutadzhik, July; Gorna Byala Rechka, July.

***Xanthogaleruca luteola* (O. F. Müller, 1766)**

Nedelkov (1909): Vratsa.

***Phyllobrotica adusta* (Creutzer, 1799)**

Tomov & Gruev (1969): Vratsa.

***Phyllobrotica quadrimaculata* (Linnaeus, 1758)**

Tomov & Gruev (1969): Vratsa.

***Sermylassa halensis* (Linnaeus, 1767)**

Warchalowski (1974): Ledenika.

New data: Milanovo, July.

ALTICINAE

***Phyllotreta astrachanica* Lopatin, 1977**

New data: Cherepish, June.

***Phyllotreta atra* (Fabricius, 1775)**

New data: Vratsa, April and July; Gorna Byala Rechka, July; Parshevitsa Hut, July and August.

***Phyllotreta balcanica* Heikertinger, 1909**

Warchalowski (1974): Ledenika.

***Phyllotreta christinae* Heikertinger, 1941**

Warchalowski (1974): Ledenika.

***Phyllotreta cruciferae* (Goeze, 1777)**

New data: Vratsa, April; Ledenika, July; Parshevitsa Hut, August.

***Phyllotreta diademata* Foudras, 1859**

New data: Vratsa, April, May and July; Gorno Byala Rechka , July; Gorno Ozirovo, July and August; Parshevitsa Hut, August.

***Phyllotreta nemorum* (Linnaeus, 1758)**

New data: Parshevitsa Hut, August.

***Phyllotreta nigripes* (Fabricius, 1775)**

New data: Ledenika, July; Parshevitsa Hut, July and August; Vratsa, October.

***Phyllotreta schneuchi* Heikertinger, 1941**

New data: Vratsa, October.

***Phyllotreta striolata* (Fabricius, 1801)**

Warchalowski (1974): Ledenika.

***Phyllotreta undulata* Kutschera, 1860**

New data: Gorna Byala Rechka, July; Vratsa, April, July, August and October.

***Phyllotreta vittula* (Redtenbacher, 1849)**

Warchalowski (1974): Vratsa.

New data: Vratsa, April, May and July; Matnitsa, August; Ledenika, July and August; Parshevitsa Hut, July and August; Gorno Ozirovo, August.

***Aphthona abdominalis* (Duftschmidt, 1825)**

Warchalowski (1974): Ledenika.

***Aphthona euphorbia*e (Schrank, 1781)**

New data: Vratsa, April and July, October; Parshevitsa Hut, July.

***Aphthona flava* Guillebeau, 1894**

New data: Matnitsa, June, Vratsa, July; Ledenika, July.

***Aphthona lacertosa* Rosenhauer, 1847**

Warchalowski (1974): Ledenika, Gruev (1992): Mezdra.

New data: Vratsa, May.

***Aphthona lutescens* (Gyllenhal, 1808)**

New data: Vratsa, April, July and August; Ledenika, July.

***Aphthona nonstriata* (Goezze, 1777)**

New data: Vratsa, May.

***Aphthona pygmaea* Kutschera, 1861**

New data: Vratsa, April; Ledenika, July.

***Aphthona venustula* Kutschera, 1861**

New data: Vratsa, April; Ledenika, July.

***Longitarsus apicalis* (Beck, 1817)**

New data: Ledenika, July.

***Longitarsus atricillus* (Gyllenhal, 1813)**

New data: Vratsa, August and October; Gorno Ozirovo, August

***Longistarsus ballotae* (Marsham, 1802)**

New data: Vratsa, May.

***Longitarsus bertii* Leonardi, 1873**

Gruev (1971): Vratsa.

New data: Vratsa, April, July.

***Longitarsus holsaticus* (Linnaeus, 1758)**

New data: Vratsa, July.

***Longitarsus luridus* (Scopoli, 1763)**

Yoakimov (1904): Mezdra.

New data: Vratsa, April, May, July, August and October; Gorna Byala Rechka, July; Ledenika, July, August; Parshevitsa Hut, August.

***Longitarsus nasturtii* (Fabricius, 1792)**

New data: Vratsa, July.

***Longitarsus nigrofasciatus* (Goeze, 1777)**

Gruev (1969): Vratsa.

New data: Vratsa, April and May; Matnitsa, June and August; Gorno Ozirovo, August.

***Longitarsus obliteratus* (Rosenhauer, 1847)**

Gruev (1969): Vratsa.

New data: Ledenika, July; Parshevitsa Hut, August.

***Longitarsus pellucidus* (Foudras, 1860)**

New data: Vratsa, July, August and October; Parshevitsa Hut, July.

***Longitarsus pratensis* (Panzer, 1794)**

New data: Vratsa, April, August and October.

***Longitarsus rubiginosus* (Foudras, 1860)**

New data: Vratsa, May.

***Longitarsus salviae* Gruev, 1975**

Gruev (1975): Vratsa.

***Longitarsus strigicollis* Wollaston, 1864**

New data: Vratsa, April, August and October.

***Longitarsus succineus* (Foudras, 1860)**

New data: Parshevitsa Hut, July and August; Matnitsa, August.

***Longitarsus suturellus* (Duftschmid, 1825)**

New data: Vratsa, October.

***Altica impressicollis* Reiche, 1862**

New data: Vratsa, April.

***Lythraria salicariae* (Paykull, 1800)**

New data: Vratsa, April.

***Neocrepidodera ferruginea* (Scopoli, 1763)**

New data: Vratsa, July; Mezdra, July; Ledenika, July and August; Parshevitsa Hut, August.

***Neocrepidodera nigritula* (Gyllenhal, 1813)**

Gruev, Tomov (1986): Vratsa.

New data: Vratsa, May.

***Neocrepidodera transversa* (Marscham, 1802)**

New data: Matnitsa, June, Vratsa, July.

***Derorcepis (Derocrepis) rufipes* (Linnaeus, 1758)**

New data: Ledenika, July.

***Derocrepis (Aeschrocnemis) serbica* (Kutschera, 1860) s.str.**

Warchalowski (1974): Ledenika.

***Hippuriphila modeeri* (Linnaeus, 1761)**

Gruev (1992): Ledenika.

New data: Mezdra, July.

***Crepidodera aurata* (Marsham, 1802)**

Tomov & Gruev (1969): Vratsa.

New data: Vratsa, April and July; Gorna Byala Rechka, July.

***Crepidodera aurea* (Geoffroy, 1785)**

Tomov & Gruev (1969): Vratsa.

New data: Vratsa, April and July; Gorno Ozirovo, July; Gorna Byala Rechka, July.

***Crepidodera fulvicornis* (Fabricius, 1792)**

New data: Vratsa, April.

***Crepidodera nigricoxis* (Allard, 1878)**

New data: Vratsa, April.

***Crepidodera plutus* (Latreille, 1804)**

New data: Vratsa, April.

***Epitrix atropae* Foudras, 1860**

Warchalowski (1974): Ledenika

***Epitrix intermedia* Foudras, 1860**

New data: Vratsa,July; Gorna Byala Rechka, July

***Minota halmae* (Apfelbeck, 1906)**

Gruev (1982): Vratsa, Biondi (1986): Vratsa.

***Podagrica malvae* (Illiger, 1807)**

New data: Vratsa, April.

***Mantura* (*Mantura*) *rustica* (Linnaeus, 1766)**

New data: Vratsa, May.

***Chaetocnema* (*Tlanoma*) *chlorophana* (Duftschmidt, 1825)**

New data: Vratsa, April, May, July and October; Ledenika, July; Matnitsa, August.

***Chaetocnema* (*T.*) *concinna* (Marsham, 1802)**

New data: Vratsa, April, May, July and October; Matnitsa, June and August; Gorna Byala Rechka, July; Lyutadzhik, July; Gorno Ozirovo, July and August; Ledenika, July and August; Parshevitsa Hut, August.

***Chaetocnema* (*T.*) *conducta* (Motschulsky, 1838)**

New data: Vratsa, Apri.l

***Chaetocnema* (*T.*) *laevicollis* (Thomson, 1866)**

New data: Ledenika, July.

***Chaetocnema* (*T.*) *tibialis* (Illiger, 1807)**

New data: Vratsa, April and May; Ledenika, August.

***Chaetocnema* (*Chaetocnema*) *aridula* (Gyllenhal, 1827)**

New data: Vratsa, April, May and July; Gorna Byala Rechka, July; Matnitsa, July, August.

***Chaetocnema* (*Ch.*) *hortensis* (Geoffroy, 1785)**

New data: Vratsa, April, May, July and October; Matnitsa, June and July; Gorna Byala Rechka, July; Milanovo, July; Parshevitsa Hut, July.

***Chaetocnema* (*Ch.*) *obesa* (Boieldieu, 1859)**

New data: Vratsa, April.

***Chaetocnema* (*Ch.*) *procerula* (Rosenhauer, 1856)**

New data: Vratsa, July.

***Chaetocnema* (*Ch.*) *subcoerulea* (Kutschera, 1864)**

New data: Vratsa, May and July; Matnitsa, June and July.

***Sphaeroderma testaceum* (Fabricius, 1775)**

Warchalowski (1974): Ledenika.

New data: Ledenika, July.

***Dibolia occultans* (Koch, 1803)**

New data: Mezdra, July; Matnitsa, August.

***Psylliodes* (*P.*) *affinis* (Paykull, 1799)**

New data: Vratsa, April and July.

***Psylliodes* (*Psylliodes*) *brisouti* Bedel, 1898**

Gruev, Král (1975): Lakatnik, Gruev (1975): Lakatnik.

***Psylliodes* (*P.*) *chalcomerus* (Illiger, 1807)**

Warchalowski (1974): Ledenika.

New data: Vratsa, April.

***Psylliodes* (*P.*) *chrysocephalus* (Linnaeus, 1758)**

Angelova (1967): Vratsa.

***Psylliodes* (*P.*) *circumdatus* (Redtenbacher, 1842)**

New data: Cherepish, June.

***Psylliodes* (*P.*) *dulcamarae* (Koch, 1803)**

New data: Vratsa, May.

***Psylliodes* (*P.*) *luteolus* (Müller, 1776)**

Warchalowski (1974): Ledenika.

***Psylliodes* (*P.*) *thlaspis* Foudras, 1860**

Gruev (1992): Mezdra.

New data: Mezdra, June.

HISPINAE

***Hispa atra* Linnaeus, 1767**

Tomov & Gruev (1969): Vratsa.

New data: Vratsa, May.

CASSIDINAE

***Cassida* (*Cassida*) *atrata* Fabricius, 1787**

Nedelkov (1909): Vratsa.

***Cassida* (*C.*) *inquinata* Brulle, 1832**

Warchalowski (1974):Ledenika.

New data: Vratsa, April.

***Cassida* (*C.*) *nebulosa* Linnaeus, 1758**

New data: Matnitsa, July.

***Cassida* (*C.*) *prasina* Illiger, 1798**

New data: Vratsa, May; Matnitsa, July.

***Cassida* (*C.*) *rubiginosa* Müller, 1776**

New data: Matnitsa, June.

***Cassida* (*C.*) *sanguinolenta* Müller, 1776**

Warchalowski (1974): Ledenika.

***Cassida* (*C.*) *vibex* Linnaeus, 1767**

Gruev (1969): Vratsa.

New data: Matnitsa, July,June.

***Cassida* (*Mionycha*) *subreticulata* Suffrian, 1844**

Gruev, Tomow (1986): Lakatnik.

New data: Lakatnik, June.

***Cassida* (*Pseudocassida*)*murraea* Linnaeus, 1767**

Nedelkov (1909): Vratsa.

New data: Matnitsa, June and July; Gorno Ozirovo, July; Gorna Byala Rechka, July.

***Cassida* (*Odontionycha*) *viridis* Linnaeus, 1758**

Tomov & Gruev(1969): Vratsa.

New data: Vratsa, July; Matnitsa, July.

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Бръмбари листояди (Coleoptera: Chrysomelidae) на Врачанска планина

ДИМИТЪР БЕЧЕВ, АНЕЛИЯ ПАВЛОВА

(Резюме)

Обобщени са публикуваните данни за семейство Chrisomelideae във Врачанска планина и са добавени непубликувани досега данни за 82 вида. С това броят на установените за планината видове става 154, принадлежащи към 46 рода.

Bechev, D. & Georgiev, D. (Eds.),
Faunistic diversity of Vrachanski Balkan Nature Park.
ZooNotes, Supplement 3, Plovdiv University Press,
Plovdiv, 2016

Ants (Hymenoptera: Formicidae) from Vrachanska Planina Mountains

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DENIS GRADINAROV

Abstract. We give a list of 29 ant species in Vrachanska Planina Mts. from 24 localities. Nine species were confirmed by previously reported data. Among all 19 unpublished species (found in 50's of last century and during 2013-2014), 10 are new for the region. Four species are of nature conservation importance.

Keywords: ants, Balkans, fauna, protected species.

Introduction

No any detailed investigations had been carried out on the myrmecofauna in Vrachanska Planina Mts. Atanassov (1934, 1936), Atanassov & Vasileva (1976) and Hubenov *et al.* (1998) reported 15 species, later Atanassov & Dlusskij (1992) added two species, Seifert (2006), Csősz *et al.* (2013) and Seifert & Csősz (2015) noted other three species from the region. As the studied area provides various habitats and relatively great difference in altitude (from about 200 to 1482 m), we expected that the ant fauna is more diverse.

The aim of this study was to collect all data available and to represent original records of ants from Vrachanska Planina Mts.

Material & Methods

Ants records from the Vrachanska Planina Mts. is given according to literature survey, museum collections and newly collected samples. Geographical coordinates and altitude information were taken about the new and confirmed species. In total, 23 localities were studied during the last two years (Table 1). The full names of the species are given in the same table. The most recent material was collected by hand by D. Gradinarov (April-October 2014) and V. Antonova (October 2013 and August 2014). The material was stored in 96 % ethanol. The samples of D. Gradinarov were determined by A. Lapeva-Gjonova and stored in her collection in the Faculty of Biology at Sofia University. The material collected by V. Antonova was stored in her collection in the Institute of Biodiversity and Ecosystem Research at the Bulgarian Academy of Sciences (IBER – BAS). The unpublished ant species from Vrachanska Planina Mts. found in the collection of Museum and Institute of Zoology (MIIZ) in Warsaw were also included in this paper. They were collected by few researchers (see Table 1) and determined by V. Antonova in 2007.

Results

The unpublished museum material and newly collected ants count 19 species in Vrachanska Planina Mts. During the recent field studies 17 ant species were found. Among all 19 species, 10 were new records for the study area (see the species marked by "*" in Table 1) and nine species were confirmed to occur there.

Four species are of conservation statute:

Formica pratensis: Lower Risk/near threatened ver 2.3 (IUCN 2015); Threatened (Checklists for the CORINE Biotopes – Annex 4).

Formica rufa: Lower Risk/near threatened ver 2.3 (IUCN 2015); Protected (Bulgarian Biodiversity Act, Annex 2 and 3); Threatened (Checklists for the CORINE Biotopes – Annex 4).

Formicoxenus nitidulus: Vulnerable A2c ver 2.3 (IUCN 2015).

Temnothorax recedens: Lower Risk/least concern ver 2.3 (IUCN 2015).

Table 1. Species composition and distribution of the ant species of Vrachanska Planina Mts.

Species	**Locality and altitude**	**Date and GPS coordinates**	**Literary source/ Collected by**
* *Myrmica rubra* (Linnaeus, 1758)	Below Temnata Dupka Cave, under a stone, 370 m	23.04.2014; N43°05.274' E23°23.259'	D. Gradinarov
Myrmica sulcinodis Nylander, 1846	Milanovo Village		Atanassov (1936)
Messor structor (Latreille, 1798)	1. Milanovo Village		Atanassov (1934, 1936); Atanassov & Vasileva (1976)
	2. Lakatnik Station		Atanassov (1934, 1936); Atanassov & Vasileva (1976)
	3. Vrattsata locality		Atanassov & Vasileva (1976)
	4. Zgorigrad Village		Atanassov & Vasileva (1976)
	5. Vratsa		Hubenov *et al.* (1998)
	6. Lakatnik	1957	Umińscy (MIIZ)
		1959	Bańkowska (MIIZ)
	7. Near Lakatnik Village, 600 m	19.10.2014; N43°05.508' E23°24.137'	D. Gradinarov
	8. Between Lakatnik Station and Milanovo Village, 480 m, karst near oak-hornbeam forest	25.07.2014; N43°05.348' E23°24.098'	D. Gradinarov

Pheidole pallidula (Nylander, 1849)	1. Lakatnik station		Atanassov (1934, 1936)
	2. Near Lakatnik Village, 690 m, meadow among *Carpinus* forest	19.10.2014; N43°05.663' E23°24.147'	D. Gradinarov
	3. Between Lakatnik Station and Milanovo Village, 480 m, karst near oak-hornbeam forest	25.07.2014; N43°05.348' E23°24.098'	D. Gradinarov
Crematogaster schmidti (Mayr, 1853)	1. Lakatnik station		Atanassov (1936)
	2. Above Lakatnik Station, near the road to Milanovo Village, 460 m	25.07.2014; N43°05.365' E23°24.001'	D. Gradinarov
** *Formicoxenus nitidulus* (Nylander, 1846)	Zgorigrad Village		Atanassov (1936)
Solenopsis fugax (Latreille, 1798)	1. Milanovo Village		Atanassov (1934)
	2. Above Milanovo Village, meadow toward Parshevitsa Hut, 990 m	07.06.2014; N43°07.796' E23°23.329'	D. Gradinarov
	3. Between Lakatnik Station and Milanovo Village, 620 m	19.10.2014; N43°05.538' E23°24.123'	D. Gradinarov
	4. Near Lakatnik Village, 690 m, meadow among *Carpinus* forest	19.10.2014; N43°05.663' E23°24.147'	D. Gradinarov
* *Temnothorax crassispinus* (Karavajev, 1926)	5 km South of Vratsa, 1000 m	07.06.2009; N43.137 E23.591	Seifert & Csősz (2015)
* *Temnothorax lichtensteini* (Bondroit, 1918)	2 km NE Zverino, 300 m	07.06.2009; N43.0956 E23.5770	Csősz *et al.* (2013)
Temnothorax nylanderi (Foerster, 1850)	Vratsa		Atanassov & Dlusskij (1992)
** *Temnothorax recedens* (Nylander, 1856)*	Between Lakatnik Station and Milanovo Village, 480 m, karst near oak-hornbeam forest	25.07.2014; N43°05.348' E23°24.098'	D. Gradinarov
Temnotorax tergestinus (Finzi, 1928)	Vrachanska Planina Mts 1 km SE Vola Peak, 5 km S Vratsa, 1000 m	07.06.2009; N48.13 E23.59	Csősz *et al.* (2015)
Tetramorium cf. *caespitum* (Linnaeus, 1758)	1. Milanovo Village		Atanassov (1934)
	2. Vrattsata locality		Atanassov (1934)
	3. Lakatnik Station		Atanassov (1936)
	4. Above Milanovo Village, meadow toward Parshevitsa Hut, 990 m	07.06.2014; N43°07.796' E23°23.329'	D. Gradinarov
* *Tapinoma erraticum* (Latreille, 1798)	Between Lakatnik Station and Milanovo Village, 480 m, karst near oak-hornbeam forest	25.07.2014; N43°05.348' E23°24.098'	D. Gradinarov

* *Plagiolepis pygmaea* (Latreille, 1798)	1. Between Lakatnik Station and Milanovo Village, 480 m, karst near oak-hornbeam forest	25.07.2014; N43°05.348' E23°24.098'	D. Gradinarov
	2. Above Milanovo Village, meadow towards Parshevitsa Hut, 990 m	07.06.2014; N43°07.796' E23°23.329'	D. Gradinarov
	3. Near Lakatnik Village, 690 m, meadow among *Carpinus* forest	19.10.2014	D. Gradinarov
	4. Near Lakatnik Village, 600 m	19.10.2014	D. Gradinarov
Lasius alienus (Foerster, 1850)	Lakatnik Station		Atanassov (1936)
* *Lasius emarginatus* (Olivier, 1792)	1. Lakatnik	1959	Bańkowska (MIIZ)
	2. Between Lakatnik Station and Milanovo Village, 620 m	19.10.2014; N43°05.538' E23°24.123'	D. Gradinarov
Lasius flavus (Fabricius, 1782)	Milanovo Village		Atanassov (1934)
* *Lasius niger* (Linnaeus, 1758)	Lakatnik	1959	Bańkowska (MIIZ)
* *Lasius platythorax* Seifert, 1991	Lakatnik	1959	Bańkowska (MIIZ)
* *Lasius psammophilus* Seifert, 1992	Above Milanovo Village, 900 m, on *Quercus* sp.	07.06.2014; N 43°07'26" E 23°23'32"	D. Gradinarov
Camponotus aethiops (Latreille, 1798)	1. Ledenika Cave		Atanassov (1934)
	2. Lakatnik	1959	Bańkowska (MIIZ)
	3. Between Lakatnik Station and Milanovo Village, 690 m, meadow among *Carpinus* forest	19.10.2014; N43°05.663' E23°24.147'	D. Gradinarov
* *Camponotus piceus* (Leach, 1825)	1. Between Lakatnik Station and Milanovo Village, 480 m	25.07.2014; N43°05.348' E23°24.098'	D. Gradinarov
	2. Above Milanovo Village, 900 m, on oak trees	07.06.2014; 43°07'26" N 23°23'32" E	D. Gradinarov
	3. Between Lakatnik Station and Milanovo Village, 620 m	19.10.2014; N43°05.538' E23°24.123'	D. Gradinarov
Camponotus vagus (Scopoli, 1763)	1. Ledenika Cave		Atanasov (1936)
	2. Above Milanovo Village, towards Parshevitsa Hut, 1000 m, nest in a stump	25.06.2014; N 43°08.090 E 23°23.364	D. Gradinarov
Formica exsecta Nylander, 1846	Gerana mine near Milanovo Village		Atanassov (1936)
* *Formica gagates* Latreille, 1798	Above Lakatnik Station, near the road to Milanovo Village, 460 m, hornbeam forest	25.07.2014; N43°05.365' E23°24.001'	D. Gradinarov

** *Formica pratensis* Retzius, 1783	1. Zgorigrad Village		Atanassov (1936)
	2. Above Milanovo Village, meadow toward Parshevitsa Hut, 990 m	07.06.2014; N43°07.796' E23°23.329'	D. Gradinarov
	3. Road towards to Ledenika Cave, 930 m, ecotone of *Pinus nigra* forest	02.08.2014; N43.20058 E23.48381	V. Antonova
	4. Road towards to Ledenika Cave, 1025 m, mixed forest	02.08.2014; N43.19722 E23.49050	V. Antonova
	5. South of Zgorigrad Village, 620 m, ecotone of mixed forest	19.10.2013; N43.16441 E23.50330	V. Antonova
		19.10.2013; N43.16493 E23.50314	V. Antonova
		19.10.2013; N43.16525 E23.50271	V. Antonova
** *Formica rufa* Linnaeus, 1761	1. Milanovo Village, Zgorigrad Village		Atanassov (1934)
	2. Road towards to Ledenika Cave, 930 m, *Pinus nigra* forest ecotone	02.08.2014; N43.20118 E23.48568	V. Antonova
	3. Road towards to Ledenika Cave, 1025 m, mixed forest	02.08.2014; N43.19746 E23.48977	V. Antonova
	4. Between Ledenika Cave and Parshevitsa Hut, 1030 m, *Pinus sylvestris* forest	19.10.2013; N43.17981 E23.48440	V. Antonova
		19.10.2013; N43.17978 E23.48438	V. Antonova
	5. Zgorigrad Village, 537 m, ecotone of *Pinus sylvestris* forest	19.10.2013; N43.17415 E23.50953	V. Antonova
		19.10.2013; N43.17427 E23.50946	V. Antonova
Formica sanguinea Latreille, 1798	Gerana mine near Milanovo Village		Atanassov (1934)

***** - new records for the region ****** - species of conservation statute

Considering the ecological preferences of the ants (according to Seifert 1996), 17 of all known species in Vrachanska Planina Mts. were thermophilic and occur mainly in open habitats (e.g. *Messor structor*, *Pheidole pallidula*, *Solenopsis fugax*, *Tapinoma erraticum*, *Plagiolepis pygmaea*, the three *Camponotus* species), two were eurytopic (*Myrmica rubra* and *Lasius niger*) and three – mesophilic species of open areas (*Myrmica sulcinodis*, *Lasius emarginatus* and *Lasius flavus*). The rest of the species (e.g. *Temnothorax crassispinus*, *Lasius platythorax* and *Formica rufa*)

prefer shady habitats (woods, hedges etc.). Such high number of thermophilic species was expected according to the physico-geographical characteristics of this karst region.

According to the recent catalogue of the ants in Bulgaria (Lapeva-Gjonova *et al.* 2010) and later papers regarding some Bulgarian species (e.g. Borowiec & Salata 2012, Borowiec 2014, Seifert & Csősz 2015), the total number in the country is 175 species. All known ant species (29 species) of Vrachanska Planina Mts. represent about 16 % of the Bulgarian myrmecofauna. We expect that this number will increase after detailed future investigations.

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Мравки (Hymenoptera: Formicidae) от Врачанска планина

ВЕРА АНТОНОВА, АЛБЕНА ЛАПЕВА-ГЪОНОВА, ДЕНИС ГРАДИНАРОВ

(Резюме)

Съобщават се 29 вида мравки от 24 находища за района на Врачанска планина. Девет вида, дадени по литературни данни, са потвърдени. От 19-те непубликувани видове (събирани през 50-те години на XX век и в периода 2013-2014 год.), 10 са нови за района. Четири вида мравки са консервационно значими.

Bechev, D. & Georgiev, D. (Eds.),
Faunistic diversity of Vrachanski Balkan Nature Park.
ZooNotes, Supplement 3, Plovdiv University Press,
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Caddisfly larvae (Trichoptera, Insecta) from the Vrachanska Planina Mountains

VESELA EVTIMOVA, VIOLETA TYUFEKCHIEVA, LYUBOMIR KENDEROV

Abstract. Faunistic data on the larval stages of the insect order Trichoptera from the Vrachanska Planina Mts. are presented for the first time. A total of six locations in four rivers were sampled. Twenty-one taxa belonging to seven families were recorded. They represent a little more than 8% of the Trichoptera species, found on the territory of Bulgaria. This estimate is based on the total number of caddisflies from Bulgaria (including adult and larval stages). Two of the recorded taxa are classified as rare, while *Odontocerum hellenicum* Malicky, 1972 is a Balkan endemic. These figures are likely higher owing to the fact that a considerable number of the caddisfly larvae of the rare and endemic species are lacking description.

Key words: Trichoptera larvae, Vrachanska Planina Mts., Balkan Mts., Bulgaria.

Introduction

The Vrachanska Planina Mts. lies in the west of the Bulgarian part of the Balkan Mts.. There is no species inventory of the aquatic Trichoptera fauna from the region as data in the available literature are largely lacking. At present, Bulgarian Trichoptera fauna includes 258 species, as based on the adult stages of this insect order (Kumanski 2007).

Kumanski (1985, 1988, 2007) in his contribution to the Fauna of Bulgaria series presents data on the distribution of the adults of the order Trichoptera from Bulgaria. Among the localities of many of the species he mentions the Balkan Mts.. However, there is no specific information on the caddisfly fauna from the Vrachanska Planina Mts..

The aim of the current study is to present original data on the taxonomic composition of Trichoptera order from rivers in the Vrachanska Planina Mts. with notes on endemism and rare species.

Material and Methods

The caddis specimens were collected from four rivers on the territory of the Vrachanska Planina Mts., North-western Bulgaria: Desna River, Leva River, Gluharska River and Cherna River. A total of six sampling locations were visited (Table 1). One sampling site was selected in Desna and Leva Rivers each, while the upper and lower stretch of the Gluharska (stations 1 and 2) and Cherna (stations 1 and 2) Rivers were sampled. All Universal Transverse Mercator coordinate system (UTM) codes of the rivers are according to the Bulgarian UTM Directory computer programme (Michev 1999).

Table 1. Sampling locations with geographical coordinates, altitudes and UTM codes.

	Desna River	Leva River	Gluharska River st. 1	Gluharska River st. 2	Cherna River st. 1	Cherna River st. 2
Northing	43°09'30.5"	43°10'10.3"	43°10'27.0"	43°11'35.4"	43°13'07.5"	43°14'18.2"
Easting	23°29'14.9"	23°30'21.6"	23°27'15.3"	23°25'30.0"	23°23'35.0"	23°21'33.9"
Altitude, m a.s.l.	801	564	608	412	328	278
UTM code	GN08	GN08	FN98	FN98	FN99	FN99

The field-work was carried out in June 2013. Macroinvertebrate samples were collected following the multi-habitat approach adapted for Bulgaria (Cheshmedjiev *et al.* 2011). All benthic samples were fixed in 70% ethanol upon collection. Their taxonomic identification was done following Waringer & Graf (1997, 2013); Ivanov *et al.* (2001); Wallace *et al.* (2003); Kumanski *et al.* (2004); Karaouzas (2009) and Oscoz *et al.* (2011). The caddisflies are currently stored at the Institute of Biodiversity and Ecosystem Research, Bulgarian Academy of Sciences (IBER- BAS, Sofia).

Results

We registered a total of 21 taxa of Trichoptera larvae from the six sampling localities (Table 2). They belong to seven families. The total number of taxa found at a station varies between four (Desna River) and 11 (Gluharska River 2).

Table 2. Taxon list of Trichoptera larvae registered from Vrachanska Planina Mts., Northwestern Bulgaria.

Family/ Taxon	Desna River	Leva River	Gluharska River st.1	Gluharska River st.2	Cherna River st.1	Cherna River st.2
Philopotamidae						
Philopotamus montanus (Donovan, 1813)	+		+	+		
Polycentropodidae						
Plectrocnemia conspersa (Curtis, 1834)	+					
Hydropsychidae						
Hydropsyche tabacarui Botosaneanu, 1960		+	+	+	+	+
Hydropsyche cf. *instabilis* (Curtis, 1834)		+	+	+	+	
Hydropsyche ornatula McLachlan, 1878		+				
Hydropsyche cf. *peristerica* Botosaneanu & Marinkovic´ -Gospodnetic´, 1966			+	+		+
Hydropsyche cf. *incognita* Pitsch, 1993					+	+
Hydropsyche sp. (instar I-IV)						
Cheumatopsyche lepida (Pictet, 1834)					+	
Pupae Hydropsychidae		+	+	+	+	
Rhyacophilidae						
Rhyacophila obliterata McLachlan, 1863			+	+		
Rhyacophila nubila (Zetterstedt, 1840)		+	+		+	+
Rhyacophila fasciata Hagen, 1859		+		+	+	+
Rhyacophila sp. (instar I-IV)						
Limnephilidae						
Micropterna cf. *nycterobia* McLachlan, 1875	+					
Chaetopteryx s.l. *villosa*	+	+		+		
Drusus sp.			+			
Halesus cf. *digitatus* (Schrank, 1781)				+		
cf. *Anabolia* sp.				+		
Euriciformi indet sp.1 (cf. Limnephilidae)						+
Odontoceridae						
Odontocerum hellenicum Malicky, 1972				+		
Sericostomatidae						
Sericostoma flavicorne Schneider, 1845				+		
Euriciformi indet sp.2 (cf. Sericostomatidae)			+		+	
Unidentified						
Euriciformi indet sp.3		+				

Caseless larvae dominate the samples except for Desna River. The most taxon-rich family is Hydropsychidae with six taxa, followed by Limnephilidae with five taxa. Three of the families are represented by one taxon only.

Rare are three of the recorded species: *Hydropsyche tabacarui* Botosaneanu, 1960; *H. ornatula* McLachlan, 1878 (Kumanski 1985) and *Halesus* cf. *digitatus* [(Schrank 1781), Hubenov *et al.* 2000]. One of the species we have found is classified as a Balkan endemic: *Odontocerum hellenicum* Malicky, 1972 (Hubenov *et al.* 2000).

Discussion

This paper presents original results on the larvae of Trichoptera for the Vrachanska Planina Mts.. The recoded taxa represent about 8% of the Bulgarian species as based on the figures for the adult stages of the order (Kumanski 2007). Noteworthy is the fact that the aquatic stages of some of the caddisfly species, whose adult stages are known from Bulgaria, have not been described yet. Thus, their identification is a rather challenging task and the number of the Trichoptera larvae recorded on the territory of the country is likely lower than the total number given for the adult stages by Kumanski (2007).

Currently Trichoptera order is not included in the Red List of Threatened Invertebrates of Bulgaria (Golemansky ed. 2011), while only four extinct species are included in the IUCN Red List of caddisflies (IUCN 2014). The above hinders us from providing information on the conservation status of the recorded species.

Presently, 52 rare taxa of caddisflies are known from Bulgaria; 18 are Balkan and 17 Bulgarian endemics (Hubenov *et al.* 1998, 2000). Three rare species and three endemics have been recorded from the Western Balkan Mts. (Hubenov *et al.* 1998). However, the larval stages of many of the endemic or rare species are unknown. Therefore, the guides used for the taxonomic determination of the taxa (see Material and Methods) often lack a substantial percentage of the species which is the case, for instance, for the genera *Hydropsyche* and *Rhyacophila*. Moreover, we have recorded *Chaetopteryx* sp. from the *villosa* group from Desna, Leva and Gluharska (at station 2) rivers. Kumanski (1988) has found two Balkan endemics of the genus in Bulgaria: *Ch. stankovici* Marinkovic, 1966 and *Ch. bosniaca* Marinkovic, 1955 but their larvae have not been described so far.

Additionally, our investigation included only a small number of rivers located on the territory of the Vrachanska Mountain. Therefore, the taxon list presented in the current work is not exhaustive and further research on the taxonomic diversity of the Trichoptera fauna from the mountain is needed.

Trichoptera larvae are known to be sensitive to various anthropogenic disturbances, *e.g.* organic pollution, acidity, impoundment and extreme events in hydrological regime (Lenat 1988, Barbour *et al.* 1996, Wallace *et al.* 1996, Sandin & Johnson 2000, Power *et al.* 2008, Evtimova 2013, Evtimova & Donohue 2014). Therefore, expanding our understanding on their taxonomy and distribution will not only advance scientists' knowledge on biodiversity but could serve as a basis for future monitoring programmes and assist ecological assessment of aquatic ecosystems.

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Ручейници (Trichoptera, Insecta) от Врачанска планина

ВЕСЕЛА ЕВТИМОВА, ВИОЛЕТА ТЮФЕКЧИЕВА, ЛЮБОМИР КЕНДЕРОВ

(Резюме)

Настоящата работа представя за първи път данни за ларвите на насекомите от разред Трихоптера (ручейници) от Врачанска планина. Пробите бяха събрани от общо шест пункта в четири реки. Установени бяха 21 таксона, принадлежащи към седем семейства. Те представляват малко над 8% от ручейниците, регистрирани на територията на България. Тази оценка се базира на общия брой трихоптерни видове от България (включително и възрастни екземпляри). Два от съобщените таксона могат да се определят като редки, а *Odontocerum hellenicum* Malicky, 1972 е балкански ендемит. Най-вероятно тези стойности са по-големи, тъй като за значителна част от ларвите на ручейниците на редките и ендемични видове липсва описание.

Bechev, D. & Georgiev, D. (Eds.),
Faunistic diversity of Vrachanski Balkan Nature Park.
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Fungus gnats (Diptera: Bolitophilidae, Diadocidiidae, Ditomyiidae, Keroplatidae and Mycetophilidae) of Vrachanska Planina Mountains

DIMITAR BECHEV, ANELIYA PAVLOVA

Abstract. Till now, 162 species of fungus gnats are found in Vrachanska Planina Mts.. Three new to the fauna of Bulgaria and to the mountain species are reported here: *Docosia lastovkai*, *D. muranica* and *D. nigra*.

Key words: fungus gnats, Western Stara Planina, Bulgaria.

Introduction

All available faunistic data about the fungus gnat fauna of Bulgaria up to 2010 is summarised by Bechev (2006, 2010). By adding a new species described by Bechev & Pavlova (2012) the total number of species known to the country is 313.

Material and Methods

This paper includes all the published data about fungus gnats of Vrachanska Planina Mountais and three new to the fauna of Bulgaria and to the mountain species of the genus *Docosia* Winnertz, 1863.

Information for the localities

Locality	Type locality	UTM	Altitude Min	Altitude Max in m a.s.l.	Vegetation belts	Dominant trees
Borov Kamak	pl	GN08		700	MB	*Fagus sylvatica*
Druzhevo	v	FN98		900	MB	
Gorna Byala Rechka	v	FN98		800	MB	
Gorno Ozirovo	v	FN98		700	MB	
Ledenika	h	GN08		800	MB	*Fagus sylvatica*
Matnitsa	pl	FN99		350	XO	*Quercus* spp.
Ochin Dol	v	GN07	550	600	MOH	
Parshevitsa	h	GN08		1250	MB	*Fagus sylvatica*
Rebarkovo	v	GN27		250	XO	
Reznyovete	c	GN08		800	MB	
Vratsa	t	GN08		350	XO	
Zgorigrad (over)	v	GN08	600	650	MB	*Fagus sylvatica*

Abbreviations: c = cave **h** = hut, **pl** = place, **E** of =East of, **t** = town, **v** = village, XO = xerothermic oak forests, MB = mesophilous beech forests, MOH = mesophilous oak-hornbeam forests

Species list

Bolitophilidae

***Bolitophila* (*Bolitophila*) *cinerea* Meigen, 1818**

GN08: Parshevitsa.

***Bolitophila* (*Bolitophila*) *saundersii* (Curtis, 1836)**

GN08: Zgorigrad; Parshevitsa.

***Bolitophila* (*Cliopisa*) *fumida* Edwards, 1941**

GN08: Parshevitsa.

***Bolitophila* (*Cliopisa*) *pseudohybrida* Landrock, 1912**

FN99: Matnitsa; GN08: Vratsa.

Diadocidiidae

***Diadocidia* (*Diadocidia*) *ferruginosa* (Meigen, 1830)**

FN99: Matnitsa; GN08: Zgorigrad; Parshevitsa; Ledenika.

Ditomyiidae

***Ditomyia fasciata* (Meigen, 1818)**

GN08: Vratsa; Parshevitsa.

Keroplatidae

Keroplatinae

Keroplatini

***Cerotelion racovitzai* Matile et Burghele-Balacesco, 1969**
GN08: Zgorigrad.

***Cerotelion striatum* (Gmelin, 1790)**
GN08: Vratsa.

***Keroplatus reaumurii* Dufour, 1839**
GN08: Vratsa.

***Keroplatus testaceus* Dalman, 1818**
GN08: Vratsa.

Orfeliini

***Isoneuromyia semirufa* (Meigen, 1818)**
FN99: Matnitsa.

***Monocentrota matilei* Bechev, 1989**
GN08: Vratza.

***Neoplatyura nigricauda* (Strobl, 1893)**
FN99: Matnitsa.

***Orfelia bezzii* (Strobl, 1909)**
GN08: Vratsa.

***Orfelia lugubris* (Zetterstedt, 1851)**
GN08: Vratsa.

Orfelia nigricornis (Fabricius, 1805)
GN08: Vratsa.

Orfelia ochracea (Meigen, 1818)
GN08: Vratsa.

***Pyratula perpusilla* (Edwards, 1913)**
FN98: Druzhevo (E of Druzhevo); GN08: Vratsa.

***Pyratula zonata* (Zetterstedt, 1855)**
GN08: Vratsa.

Macrocerinae

***Macrocera anglica* Edwards, 1925**
FN99: Matnitsa.

***Macrocera angulata* Meigen, 1818**
GN08: Vratsa.

***Macrocera centralis* Meigen, 1818**
FN98: Druzhevo; GN08: Ledenika.

***Macrocera crassicornis* Winnertz, 1863**
GN08: Vratsa.

***Macrocera fasciata* Meigen, 1804**
FN99: Matnitsa; GN08: Vratsa; Ledenika; Parshevitsa.

***Macrocera nigricoxa* Winnertz, 1863**
GN08: Vratsa.
***Macrocera parva* Lundström, 1914**
GN08: Zgorigrad.
***Macrocera phalerata* Meigen, 1818**
FN99: Matnitsa; GN08: Vratsa; Parshevitsa.
***Macrocera pilosa* Landrock, 1917**
GN08: Ledenika.
***Macrocera stigma* Curtis, 1837**
GN08: Ledenika; Parshevitsa.
***Macrocera vittata* Meigen, 1830**
FN98: Druzhevo; GN08: Zgorigrad.

Mycetophilidae

Mycomyinae

***Mycomya* (*Cymomya*) *circumdata* (Staeger, 1840)**
GN08: Parshevitsa.
***Mycomya* (*Mycomya*) *cinerascens* (Macquart, 1826)**
GN08: Ledenika.
***Mycomya* (*Mycomya*) *marginata* (Meigen, 1818)**
FN99: Matnitsa; GN07: Ochin Dol; GN08: Zgorigrad; Borov Kamak; Vratsa.
***Mycomya* (*Mycomya*) *occultans* (Winnertz, 1863)**
GN08: Vratsa.
***Mycomya* (*Mycomya*) *parva* (Dziedzicki, 1885)**
GN08: Parshevitsa.
***Mycomya* (*Mycomya*) *tenuis* (Walker, 1856)**
FN99: Matnitsa; GN08: Parshevitsa.
***Mycomya* (*Mycomya*) *tridens* (Lundström, 1911)**
GN08: Parshevitsa; Vratsa; Zgorigrad; Ledenika.
***Mycomya* (*Mycomya*) *winnertzi* (Dziedzicki, 1885)**
FN99: Matnitsa.
***Mycomya* (*Mycomyopsis*) *trilineata* (Zetterstedt, 1838)**
FN99: Matnitsa.
***Neoempheria proxima* (Winnertz, 1863)**
FN99: Matnitsa.
***Neoempheria striata* (Meigen, 1818)**
GN08: Vratsa.

Gnoristinae

***Boletina anderschi* (Stannius, 1831)**
GN08: Ledenika.
***Boletina basalis* (Meigen, 1818)**
GN08: Parshevitsa.
***Boletina gripha* Dziedzicki, 1885**
FN98: Gorna Byala Rechka; FN99: Matnitsa; GN08: Parshevitsa; Borov Kamak.

***Boletina lundstroemi* Landrock, 1912**
FN98: Gorna Byala Rechka.
***Boletina nigricoxa* Staeger, 1840**
GN08: Ledenika; Vratsa.
***Boletina nitida* Grzegorzek, 1885**
FN99: Matnitsa.
***Boletina sciarina* Staeger, 1840**
GN08: Vratsa.
***Boletina trivittata* (Meigen, 1818)**
GN08: Parshevitsa.
***Coelosia flava* (Staeger, 1840)**
GN08: Parshevitsa.
***Ectrepesthoneura ledenikiensis* Bechev, 1988**
GN08: Ledenika.
***Grzegorzekia collaris* (Meigen, 1818)**
GN08: Parshevitsa.
***Palaeodocosia vittata* (Coquillett, 1901)**
GN08: Parshevitsa.
***Synapha vitripennis* (Meigen, 1818)**
FN99: Matnitsa; GN08: Parshevitsa.
***Tetragoneura ambigua* Grzegorzek, 1885**
GN08: Borov Kamak; Parshevitsa.

Sciophilinae

***Acnemia falcata* Zaitzev, 1982**
FN98: Gorna Byala Rechka.
***Acnemia longipes* Winnertz, 1863**
FN99: Matnitsa.
***Acnemia nitidicollis* (Meigen, 1818)**
FN99: Matnitsa; GN08: Parshevitsa.
***Acnemia vratzatica* Bechev, 1985**
GN08: Zgorigrad.
***Anaclileia beshovskii* Bechev, 1990**
GN08: Parshevitsa.
***Megalopelma nigroclavatum* (Strobl, 1910)**
GN08: Parshevitsa; Vratsa.
***Monoclona rufilatera* (Walker, 1837)**
N99: Matnitsa.
***Neuratelia minor* (Lundström, 1912)**
GN08: Ledenika; Parshevitsa.
***Neuratelia nemoralis* (Meigen, 1818)**
GN08: Parshevitsa.
***Phthinia humilis* Winnertz, 1863**
GN07: Ochin Dol; GN08: Ledenika; Parshevitsa.
***Sciophila baltica* Zaitzev, 1982**
GN08: Parshevitsa.

***Sciophila lutea* Macquart, 1826**
FN99: Matnitsa; GN08: Vratsa; Parshevitsa.

***Sciophila nonnisilva* Hutson, 1979**
FN99: Matnitsa.

***Sciophila thoracica* Staeger, 1840**
FN99: Matnitsa.

***Speolepta leptogaster* (Winnertz, 1863)**
GN08: Vratsa.

Leiinae

***Docosia gilvipes* (Walker, 1856)**
FN99: Matnitsa; GN08: Borov Kamak.

***Docosia lastovkai* Chandler, 1994**
GN08: Ledenika, 20.06.1984, 1♂.

***Docosia moravica* Landrock, 1916**
GN08: Vratsa.

***Docosia muranica* Kurina & Ševčík, 2011**
GN08: Ledenika, 20.04.1984, 1♂.

***Docosia nigra* Landrock, 1918**
GN08: Zgorigrad, 13.04.1984, 1♂.

***Leia bimaculata* (Meigen, 1804)**
FN99: Matnitsa; GN07: Ochin Dol; GN08: Vratsa; Parshevitsa; GN17: Rebarkovo.

***Leia cylindrica* (Winnertz, 1863)**
FN99: Matnitsa; GN08: Vratsa.

***Leia winthemii* Lehmann, 1822**
GN08: Parshevitsa.

***Novakia scatopsiformis* Strobl, 1893**
GN08: Ledenika.

***Rondaniella dimidiata* (Meigen, 1804)**
GN08: Parshevitsa.

Mycetophilinae

Exechiini

***Allodia* (*Allodia*) *lugens* Wiedemann, 1817**
FN99: Matnitsa; GN08: Parshevitsa; Ledenika; Zgorigrad.

***Allodia* (*Allodia*) *ornaticollis* (Meigen, 1818)**
FN99: Matnitsa.

***Allodia* (*Brachicampta*) *alternans* (Zetterstedt, 1838)**
FN99: Matnitsa; GN08: Parshevitsa; Vratsa; Ledenika.

***Allodia* (*Brachycampta*) *barbata* (Lundström, 1909)**
FN99: Matnitsa.

***Allodia* (*Brachycampta*) *foliifera* (Strobl, 1910)**
GN08: Vratsa.

***Allodia* (*Brachycampta*) *grata* (Meigen, 1830)**
FN99: Matnitsa; GN07: Ochin Dol; GN08: Zgorigrad; Ledenika; Parshevitsa.

***Allodia* (*Brachycampta*) *neglecta* Edwards, 1925**
GN07: Ochin Dol; GN08: Vratsa.

***Allodia* (*Brachycampta*) *pistillata* (Lundström, 1911)**
FN99: Matnitsa; GN08: Parshevitsa; Vratsa.

***Allodia* (*Brachycampta*) *silvatica* (Landrock, 1912)**
GN08: Vratsa.

***Allodia* (*Brachycampta*) *triangularis* (Strobl, 1895)**
FN99: Matnitsa.

***Allodia* (*Brachycampta*) *westerholti* Caspers, 1980**
GN08: Ledenika.

***Allodiopsis domestica* (Meigen, 1830)**
GN08: Parshevitsa.

***Allodiopsis rustica* (Edwards, 1941)**
FN99: Matnitsa; GN08: Ledenika; Vratsa; Borov Kamak; Zgorigrad.

***Anatella simpatica* Dziedzicki, 1923**
GN08: Zgorigrad.

***Brevicornu* (*Brevicornu*) *fissicauda* (Lundström, 1911)**
FN99: Matnitsa; GN08: Parshevitsa; Vratsa.

***Brevicornu* (*Brevicornu*) *griseicolle* (Staeger, 1840)**
FN98: Gorna Byala Rechka; FN99: Matnitsa; GN08: Parshevitsa; Borov Kamak; Zgorigrad.

***Brevicornu* (*Brevicornu*) *sericoma* (Meigen, 1830)**
FN98: Gorna Byala Rechka; FN99: Matnitsa; GN07: Ochin Dol; GN08: Vratsa; Parshevitsa; Ledenika.

***Cordyla crassicornis* Meigen, 1818**
FN99: Matnitsa; GN08: Zgorigrad; Vratsa.

***Cordyla fissa* Edwards, 1925**
FN98: Gorna Byala rechka; FN99: Matnitsa; GN08: Parshevitsa; Ledenika.

***Cordyla fusca* Meigen, 1804**
FN99: Matnitsa.

***Cordyla murina* Winnertz, 1863**
FN99: Matnitsa; GN08: Zgorigrad; Vratsa.

***Cordyla nitens* Winnertz, 1863**
FN99: Matnitsa.

***Exechia bicincta* (Staeger, 1840)**
FN99: Matnitsa; GN08: Ledenika; Parshevitsa; Vratsa; Borov Kamak.

***Exechia dorsalis* (Staeger, 1840)**
GN08: Ledenika.

***Exechia exigua* Lundström, 1909**
GN08: Parshevitsa; Vratsa.

***Exechia fulva* Santos Abreu, 1920**
GN08: Parshevitsa.

***Exechia fusca* (Meigen, 1804)**
FN98: Druzhevo; Gorna Byala Rechka; FN99: Matnitsa; GN08: Vratsa; Parshevitsa; Ledenika.

***Exechia lundstroemi* Landrock, 1923**
GN08: Ledenika.

***Exechia separata* Lundström, 1912**
GN08: Parshevitsa; Vratsa.

***Exechia seriata* (Meigen, 1830)**
FN99: Matnitsa; GN08: Ledenika; Parshevitsa; Zgorigrad (above of).

***Exechiopsis* (*Exechiopsis*) *furcata* (Lundström, 1912)**
GN08: Parshevitsa; Reznyovete.

***Exechiopsis* (*Exechiopsis*) *indecisa* (Walker, 1856)**
GN08: Reznyovete.

***Exechiopsis* (*Exechiopsis*) *intersecta* (Meigen, 1818)**
GN08: Ledenika.

***Exechiopsis* (*Exechiopsis*) *magnicauda* (Lundström, 1911)**
GN08: Ledenika; Parshevitsa.

***Exechiopsis* (*Exechiopsis*) *vizzavonensis* (Edwards, 1928)**
GN08: Reznyovete.

***Pseudobrachypeza helvetica* (Walker, 1856)**
GN08: Zgorigrad.

***Rymosia affinis* Winnertz, 1863**
GN08: Parshevitsa; Vratsa.

***Rymosia fasciata* (Meigen, 1804)**
GN08: Ledenika.

***Rymosia spinipes* Winnertz, 1863**
GN08: Ledenika.

***Synplasta gracilis* (Winnertz, 1863)**
GN08: Parshevitsa.

***Synplasta exclusa* (Dziedzicki, 1889)**
GN08: Zgorigrad.

***Tarnania fenestralis* (Meigen, 1818)**
GN08: Ledenika; Vratsa; Reznyovete; Parshevitsa.

Mycetophilini

***Dynatosoma fuscicorne* (Meigen, 1818)**
GN08: Vratsa; Ledenika.

***Dynatosoma majus* Landrock, 1912**
FN99: Matnitsa; GN08: Vratsa.

***Epicypta torquata* Matile, 1977**
FN99: Matnitsa.

***Mycetophila alea* Laffoon, 1965**
FN99: Matnitsa; GN08: Ledenika; Parshevitsa.

***Mycetophila bialorussica* Dziedzicki, 1884**
GN08: Ledenika.

***Mycetophila blanda* Winnertz, 1863**
GN08: Vratsa; Parshevitsa; Ledenika.

***Mycetophila confluens* Dziedzicki, 1884**
GN08: Parshevitsa; Ledenika.

***Mycetophila czizeki* Landrock, 1911**
FN99: Matnitsa; GN07: Ochin Dol.

***Mycetophila distigma* Meigen, 1830**
GN08: Vratsa.

***Mycetophila edwardsi* Lundström, 1913**
GN08: Vratsa; Parshevitsa; Zgorigrad (above of).

***Mycetophila fungorum* (De Geer, 1776)**
FN98: Gorna Byala Rechka; FN99: Matnitsa; GN08: Parshevitsa; Ledenika; Vratsa.

***Mycetophila luctuosa* Meigen, 1830**
FN98: Gorna Byala Rechka; FN99: Matnitsa; GN07: Ochin Dol.

***Mycetophila marginata* Winnertz, 1863**
FN99: Matnitsa; GN08: Ledenika; Vratsa; Parshevitsa; Zgorigrad.

***Mycetophila morosa* Winnertz, 1863**
GN08: Parshevitsa.

***Mycetophila ocellus* Walker, 1848**
FN98: Gorna Byala Rechka; FN99: Matnitsa; GN08: Ledenika; Parshevitsa; Vratsa.

***Mycetophila ornata* Stephens, 1829**
GN08: Vratsa; Ledenika.

***Mycetophila pumila* Winnertz, 1863**
FN99: Matnitsa.

***Mycetophila signatoides* Dziedzicki, 1884**
GN07: Ochin Dol.

***Mycetophila spectabilis* Winnertz, 1863**
FN99: Matnitsa; GN08: Parshevitsa; Vratsa; Zgorigrad.

***Mycetophila stolida* Walker, 1856**
GN08: Ledenika.

***Mycetophila trinotata* Staeger, 1840**
GN08: Vratsa; Parshevitsa; Zgorigrad.

***Phronia biarcuata* (Becker, 1908)**
GN08: Vratsa.

***Phronia cinerascens* Winnertz, 1863**
GN08: Vratsa.

***Phronia conformis* (Walker, 1856)**
FN99: Matnitsa; GN07: Ochin Dol.

***Phronia egregia* Dziedzicki, 1889**
GN07: Ochin Dol.

***Phronia nitidiventris* (van der Wulp, 1858)**
GN07: Ochin Dol.

***Phronia obtusa* Winnertz, 1863**
GN08: Vratsa; Ledenika.

***Phronia signata* Winnertz, 1863**
GN07: Ochin Dol.

***Phronia strenua* Winnertz, 1863**
GN07: Ochin Dol.

***Sceptonia cryptocauda* Chandler, 1991**
GN08: Ledenika; Zgorigrad.

***Sceptonia humerella* Edwards, 1941**
GN08: Ledenika.

***Sceptonia membranacea* Edwards, 1925**
GN07: Ochin Dol; GN08: Vratsa; Zgorigrad.
***Sceptonia nigra* (Meigen, 1804)**
GN08: Parshevitsa; Ledenika; Vratsa.
***Sceptonia pilosa* Bukowski, 1934**
FN99: Matnitsa.
***Sceptonia tenuis* Edwards, 1925**
GN08: Parshevitsa.
***Trichonta beata* Gagné, 1981**
GN08: Zgorigrad.
***Trichonta falcata* Lundström, 1911**
FN99: Matnitsa; GN08: Parshevitsa; Vratsa.
***Trichonta fragilis* Gagné, 1981**
GN08: Vratsa; Zgorigrad.
***Trichonta submaculata* (Staeger, 1840)**
GN08: Ledenika.
***Trichonta terminalis* (Walker, 1856)**
GN08: Vratsa.
***Trichonta vitta* (Meigen, 1830)**
FN99: Matnitsa.
***Trichonta vulgaris* Loew, 1869**
GN08: Parshevitsa.
***Zygomyia humeralis* (Wiedemann, 1817)**
GN08: Parshevitsa.

Conclusion

In Vrachanska Planina Mts., 165 species of fungus gnats from 50 genera has been established. Three of them reported here are new to the fauna of Bulgaria: *Docosia lastovkai*, *D. muranica* and *D. nigra*. Endemic species for Vrachanska Planina is *Acnemia vratzatica*, known only from the type locality near Zgorigrad Village. *Ectrepesthoneura ledenikiensis* is known up to now from Bulgaria and Greece only, but is possible to have more widely distribution.

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Гъбни комари (Diptera: Bolitophilidae, Diadocidiidae, Ditomyiidae, Keroplatidae and Mycetophilidae) на Врачанска планина

ДИМИТЪР БЕЧЕВ, АНЕЛИЯ ПАВЛОВА

(Резюме)

Представена е фаунистична информация за всичките 165 вида гъбни комари (от 5 семейства и 50 рода) известни досега за Врачанска планина. От тях 3 вида, *Docosia lastovkai*, *D. muranica* и *D. nigra*, са съобщени тук за първи път за фауната на България. Ендемичен за планината е *Acnemia vratzatica*, известен досега само от типовото находище край Згориград.

Bechev, D. & Georgiev, D. (Eds.),
Faunistic diversity of Vrachanski Balkan Nature Park.
ZooNotes, Supplement 3, Plovdiv University Press,
Plovdiv, 2016

Horse Flies (Diptera: Tabanidae) of Vrachanska Planina Mountains

DIANA GANEVA

Abstract. Original and published data suggest the existence of 13 tabanid species up to now in the region. The species *Chrysops viduatus* (Fabricius, 1794), *Tabanus bifarius* Loew, 1858 and *Tabanus exclusus* Pandellé, 1883 are new records for the Vratchanska Planina Mountains. The total species registered represent 16.88% of the known Bulgarian tabanid fauna (77 tabanid species).

Key words: tabanids, fauna, Vrachanska Mountains, Bulgaria.

Introduction

The only data regarding the variety of tabanid species in Vrachanska Planina Mts. are published by Nedyalkov (1912) and Drensky (1929). On the basis of a study on the Bulgarian dipteral entomofauna, Nedyalkov (1912) reports the existence of 5 tabanid species in the region of Vratsa town [*Chrysops caecutiens* (Linnaeus, 1758)*, Tabanus bromius* Linnaeus, 1758, *T. cordiger, T. spodopterus,* and *T. tergestinus* Egger, 1859]. Later, Drensky (1929) notes that 8 of the identified for Bulgaria, 52 species and 13 subspecies of tabanids, are reported for the Vrachanska Mts. as well. Five of them [*Chrysops flavipes* Meigen, 1804, *Hybomitra pilosa* (Loew, 1858), *Tabanus miki* Brauer, 1880, *Tabanus sudeticus* Zeller, 1842 and *Philipomyia graeca* (Fabricius, 1794)] are reported for the first time for this region (Drensky 1929). The reported by Nedyalkov (1912) and Drensky (1929) a total of 10 tabanid species represent 12.78% of the known up to now for Bulgaria, 77 tabanid species (Ganeva 2008).

The scarce data regarding the composition of the tabanid fauna in Vrachanska Mts. and the lack of research on the group in the region for more than eight decades predetermined the objective of the current study.

Material and Methods

The composition of the tabanid fauna in Vrachanska Mts. was studied using material from two field research (08.07.2014 and 30.07.2014). The material was collected from 6 localities during a route collection from Ledenika Hut to Purshevitsa Hut. Due to the extremely unfavourable, meteorogical conditions during the whole active season of the tabanids in year 2014, only 10 specimens were collected and processed.

The captured specimens were processed in laboratory conditions and were identified according to Chvála *et al.* (1972) and Olsufjev (1977).

Lists of the studied localities and of the tabanid species are presented. The list of localities indicates the altitude, coordinates, collection dates and total number of collected specimens from each locality. The altitude and geographical coordinates were obtained by a Garmin GPS receiver, model Etrex Vista HCx.

The localities – new or based on published data - as well as the number, gender of the captured specimens, and the dates of the catches were indicated for each species. The serial number of the localities is presented in the List of species in brackets []. The sequence of species` arrangement was done according to the Catalogue of Palaearctic Diptera (Chvála 1988).

List of localities:

1. Meadow near the road towards the Ledenika Hut, 987 m a.s.l., 43°18274 N; 23°48712 E, 8.07.2014, 2 ♀.
2. Biotope near the road to the Parshevitsa Hut, 1100 m a.s.l., 43°17282 N; 23°48620 E, 8.07.2014, 1 ♀.
3. Vicinity of the Parshevitsa Hut, 1221 m a.s.l., 43°15115 N; 23°47515 E, 30.07.2014, 2 ♀.
4. Beech forest near the road between Parshevitsa Hut and Forest Home Hut, 1221 m a.s.l., 43°15779 N; 23°47487 E, 8.07.2014, 1 ♀.
5. Area of fountain "Friendship" under the Recreation Complex of NPP "Kozloduy", 1059 m a.s.l., 43°17587 N; 23°47577 E, 30.07.2014, 1 ♀.
6. Biotope right of the road towards the town of Vratsa, 608 m a.s.l., 43°19029 N; 23°50813 E, 30.07.2014, 3 ♀.

Results and Discussion

Ten tabanid specimens were collected and identified as a result of the conducted study. Six species from 3 genera were registered: *Chrysops* (1 species), *Tabanus* (4 species) and *Philipomyia* (1 species).

The species *Chrysops viduatus* (Fabricius, 1794), *Tabanus bifarius* Loew, 1858 and *Tabanus exclusus* Pandellé, 1883 were new records for the Vrachanska Mts..

The summarized data from the studies of Nedyalkov (1912) and Drensky (1929) show that a total of 10 species are known for the region of Vrachanska Mts.. The current study confirms the existence of 3 tabanid species and reports 3 new species as part of the tabanid fauna of the studied region. After present study a total of 13 tabanid species are known for the Vrachanska Mts..

List of the species

Family Tabanidae

Subfamily Chrysopsinae

Genus *Chrysops* Meigen, 1803

***Chrysops (Chrysops) caecutiens* (Linnaeus, 1758)**

Published data: Vratsa (Nedyalkov 1912).

***Chrysops (Chrysops) flavipes* Meigen, 1804**

Published data: Iskar Gorge (Drensky 1929).

***Chrysops (Chrysops) viduatus* (Fabricius, 1794)**

New data: [1], 8.07.2014, 1 ♀.

Genus *Hybomitra* Enderlein, 1922

***Hybomitra pilosa* (Loew, 1858)**

Published data: Cherepish Monastery (Drensky 1929).

Genus *Tabanus* Linnaeus, 1758

***Tabanus bifarius* Loew, 1858**

New data: [1], 8.07.2014, 1 ♀.

***Tabanus bromius* Linnaeus, 1758**

Published data: Vratsa (Nedyalkov 1912).

***Tabanus cordiger* Meigen, 1820**

Published data: Vratsa (Nedyalkov 1912; Drensky 1929).

***Tabanus exclusus* Pandellé, 1883**

New data: [3], 30.07.2014, 1 ♀; [5], 30.07.2014, 1 ♀.

***Tabanus miki* Brauer, 1880**

Published data: Vratsa (Drensky 1929).

***Tabanus spodopterus* Meigen, 1820**

Published data: Vratsa (Nedyalkov 1912; Drensky 1929).

***Tabanus sudeticus* Zeller, 1842**

Published data: Cherepish Monastery (Drensky 1929).

New data: [4], 8.07.2014, 1 ♀.

***Tabanus tergestinus* Egger, 1859**

Published data: Vratsa (Nedyalkov 1912; Drensky 1929).

New data: [3], 30.07.2014, 1 ♀; [6], 30.07.2014, 3 ♀.

Genus *Philipomyia* Olsufjev, 1964

***Philipomyia graeca* (Fabricius, 1794)**

Published data: Vratsa (Drensky 1929).

New data: [2], 8.07.2014, 1 ♀.

Conslusions

The route collection in Vrachanska Planina Mts. on July 2014 resulted of 6 tabanid species identified on the basis of only 10 collected specimens. This fact suggests the existence of a significant variety of species of tabanids in Vrachanska Planina and the need of detailed studies in this region.

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Конски мухи (Diptera: Tabanidae) от Врачанска планина

ДИАНА ГАНЕВА

(Резюме)

Въз основа на литературни и оригинални данни са установени 13 вида табаниди във фауната на Врачанска планина. Видовете *Chrysops viduatus* (Fabricius, 1794), *Tabanus bifarius* Loew, 1858 и *Tabanus exclusus* Pandellé, 1883 се съобщават за първи път от района на изследването. Установените видове представляват 16.88 % от известните, за България, 77 вида табаниди. Регистрираните 6 вида, само въз основа на 10 събрани екземпляра свидетелстват за значително видово разнообразие на табанидната фауна във Врачанска планина, което изисква да бъдат продължени проучванията в района.

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Terrestrial cave invertebrates of the Vrachanska Planina Mountains

PETAR BERON

Abstract: The modern biospeleological research in Bulgaria started in 1921 in the Ledenika Cave. From 65 caves of "Vrachanski Balkan" Nature Park and its surroundings have been recorded a total of 218 species of terrestrial invertebrates, including 32 species of troglobionts, most of them endemic to Vrachanska Planina Mts. (including the caves near Lakatnik): Isopoda Oniscoidea – 4, Chilopoda – 1, Diplopoda – 5, Opiliones – 2, Pseudoscorpiones – 3, Araneae – 3, Collembola – 2, Diplura – 2, Coleoptera, Carabidae – 7, Coleoptera, Leiodidae – 3. Troglobites are known from 51 caves, the richest being the caves near Lakatnik (Temnata dupka – 10, Zidanka – 7, Razhishkata dupka – 5, Svinskata dupka – 6, Kozarskata peshtera – 5), near Vratsa (Ledenika – 11, Barkite 8 – 5, Belyar – 6), Toshova dupka near Glavatsi – 6 and others.

Key words: Vrachanska Planina Mts., cave fauna, terrestrial invertebrates, Bulgaria.

Introduction

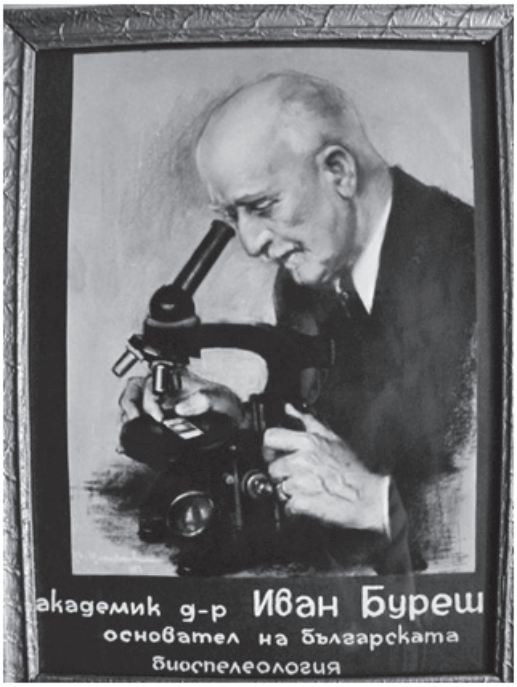
Vrachanska Planina Mts. (most of it included in the "Vrachanski Balkan" Nature Park) is among the richest areas of cave fauna. From the Ledenika Cave and the caves near Gara Lakatnik village started the modern biospeleological research in Bulgaria. Subject of the present paper is the fauna of the Park, and the surrounding areas (caves near Lilyache, Chiren, Gabare, Drashan, Cherkaski, Dolna Beshovitsa and further to Kunino and Karlukovo) are also rich in fauna and should be taken into attention to understand the distribution of the cave animals of Vrachanski Balkan. The rich fauna of the caves near Lakatnik is also connected with the fauna of caves more to the south (near Bov, Tserovo, Iskrets, Breze, Zimevitsa, etc.).

The region under study (the Park "Vrachanski Balkan" and its nearest places) includes Vratsa (SW of the town), Mezdra and the villages Lakatnik, Druzhevo, Milanovo, Zgorigrad, Glavaci, Dolno and Gorno Ozirovo, Lyutadzhik, Pavolche, Cherepish, Moravitsa, Gorna and Dolna Bela Rechka, Opletnya, Chelopek, Bistrets, Eliseyna.

Outline of the history of biospeleological studies on Bulgarian cave animals

The curiosity of Bulgarian zoologists for studying cave animals was aroused by a geologist. In 1922 V. Arnaudov indicated to Dr Iv. Buresch the existence of strange yellowish insects in the cave Ledenika near Vratsa. The experienced Director of the Royal Museum of Natural History in Sofia immediately realized how important was this observation. Together with his fellow entomologists from the Museum Dr Buresch undertook series of visits in the caves near Vratsa and in Iskâr Gorge. In several years (1923 -1926) tens of troglobites

of different groups have been discovered and described. Prominent foreign specialists visited Bulgaria or identified the material collected (to mention K. Verhoeff, Ed. Knirsch, Ed. Handschin, V. Redikorzev, A. Wagner, L. Fage, C.Fr. Roewer). Their publications increased notably the knowledge on groups like Isopoda, Myriapoda, Pseudoscorpiones, Opiliones, Collembola, Coleoptera and others in Bulgaria. Many visits of Dr Buresch and his associates in caves rose the number of organisms known from them by 1927 to 44, among which were some remarkable troglobites. A general list of this fauna was presented by Dr Buresch in September 1927 to the International Zoological Congress in Budapest (published in 1929). Meanwhile, Dr Buresch published two important papers on the cave fauna of Bulgaria (in 1924 and 1926). Nenko Radev started publishing a Catalogue of Bulgarian caves, of which also two parts were published (in 1926 and 1928). On 18 March 1929 the Bulgarian Speleological Society was founded. New visits to caves followed and a series of new publications contributed to the study of spiders (P. Drensky, 1931), Diptera (L. Czerny, 1930), Thysanura (F. Silvestri, 1931, 1942), Coleoptera (Iv. Buresch, 1925, R. Jeannel, 1924 – 1930, K. Mandl, 1942), Pseudoscorpions (J. Hadzi, 1940), Oligochaeta (L. Černosvitov, 1937, 1939), Nycteribiidae (Z. Karaman, 1939), Crustacea (W. Klie, 1936), Isopoda (H. Strouhal, 1939), Gastropoda (H. Wagner, 1934), Isopoda, Diplopoda, Chilopoda (Verhoeff, up to 1937) and others. A third general paper on Bulgarian Biospeleology was published by Dr Buresch in 1936. Most of the material originated from the caves of Vrachanska Planina Mts and Lakatnik.



After the World War II again Dr Buresch organized two "caving brigades" within Bulgarian Academy of Sciences. They studied some caves in Northwest Bulgaria and collected many new cave animals, arranged in the collection "Fauna cavernicola bulgarica" in the Institute of Zoology in Sofia. Part of this material was identified by J. Kratochvil (Opiliones, 1951, 1958a, 1958b), A. Angelov (Gastropoda, 1959, 1960), C. Attems (Myriapoda, 1951, 1959), Iv. Buresch & V. Gueorguiev (*Stenasellus*, 1962), C. Fr. Roewer (Opiliones, 1951), Z. Karaman (Coleoptera, 1958), E. Pretner (Coleoptera, 1958), F. Miller (Araneae, 1958), J. Lang (Diplopoda, 1958), and others.

These papers concern, together with the older material of Dr Buresch and his associates, some new animals (like *Paralola buresi* and *Tranteeva paradoxa*) collected in the 50-es by Petar Tranteev and the group of young Biospeleologists formed around him (V. Guéorguiev, P. Beron, V. Beshkov, T. Michev, M. Kwartirnikov, A. Popov, St. Andreev, Hr. Delchev).

After the resurrection of the organized caving in Bulgaria since 1958 the Caving Commission at Bulgarian Tourist's Union formed many caving clubs and a much more intensive research in caves took place everywhere in the country, even abroad. Considerable new collections have been accumulated and studied by the new generation of Bulgarian and some foreign specialists: Protozoa (D. Tashev, V. Golemansky, since 1961), Hirudinea (A. Angelov), Mollusca (A. Angelov, A. Riedel, esp. Zonitidae, since 1955), Isopoda (A. Vandel, St. Andreev, since 1970), Chilopoda (J.-M. Demange, J. Gulička, Z. Matic and V. Golemansky), Diplopoda (K. Strasser, from 1960 to 1975), Opiliones (V. Šilhavy, V. Staręga), Araneae (Hr. Delchev, since 1967), Orthoptera (A. Popov), Collembola (Rusek, M.M. da Gama), Diplura (Rusek), Homoptera Aphidodea (D. Tashev), Coleoptera (V. Guéorguiev, from 1959 to 1992; Z. Karaman, L. Genest, L. Zerche), Trichoptera (K. Kumanski), Diptera and Siphonaptera parasites of bats (W. Skuratowicz, K. Hůrka), Diptera (V. Beshovski). Have been started more specialized studies on the nervous system and ecology of *Pheggomisetes* and other cave beetles (M. Kwartirnikov).

Some visits or publications by foreign cave biologists also contributed to better understanding of this fauna (H. Coiffait, J.-M. Thibaud, D. Dancau, L. Botosaneanu, V. Decu, A. Riedel, L. Genest). Most data on the cave fauna of Bulgaria, however, were collected after 1960 by Bulgarian scientists. The latest bibliography of Bulgarian cave fauna (Beron, 1994) contains 409 titles of which 230 are due entirely or partly to Bulgarians.

The numerous data obtained have been generalized by Guéorguiev & Beron (1962), than by Beron & Guéorguiev (1967), Beron (1973, 1994) and finally by Beron (2015), where a complete list of 866 animal species from 813 Bulgarian caves was made. Some other general outlines of Bulgarian cave fauna are due to Guéorguiev (1966, etc.) and Beron (2005, 2006, 2007). But since the beginning of the 90 – ties considerable "new wave" of Biospeleologists marked another leap forward in the knowledge on the cave and underground fauna of Bulgaria. Several younger researchers (P. Stoev, B. Petrov, S. Beshkov, T. Ivanova, I. Pandurski, D. Georgiev) carried further the efforts of the older workers. Meanwhile, part of the explorers of Bulgarian cave animals died (P. Tranteev in 1979, Iv. Buresch in 1980, V. Guéorguiev in 1994), or retired (V. Beshkov in 1995, St. Andreev in 2003, Hr. Deltshev and P. Beron in 2010). The newer specialists work mostly in the National Museum of Nature History, Bulgarian Academy of Sciences. Already some groups are in study by them (Myriapoda P. Stoev, Pseudoscorpiones – B. Petrov, Copepoda – Iv. Pandurski, Coleoptera – B. Gueorguiev, R. Bekchiev, Lepidoptera – St. Beshkov).

Karstic Region of Stara Planina (the Predbalkan and the chain of Stara Planina) is subdivided into 19 districts. The karst of this Region covers 4980 km^2, or 19.2 % of its total area (Popov, 1970b). This Region is the richest on caves in Bulgaria. There are 19 of the 53 Bulgarian pot holes, deeper than 100 m, and 46 of the 62 Bulgarian caves, longer than 1000 m. In all parts of the Regions there are big caves and pot holes.

One classic karst area and among the richest in Bulgaria is at the Vratsa District. In its thick limestone from Jurassic and Cretaceous have been discovered more than 500 caves and pot holes. On the higher parts of Vrachanska Planina have been explored the pot holes Barkite 14 (- 356 m denivelation, 2600 m long), Belyar (- 282 m deniv., 2560 m long), Barkite 18 (- 178 m), Pukoya near Pavolche Village (- 178 m), Yavorets (- 147 m) and Panchovi Gramadi (- 104 m) near Zverino and Haydushkata near Bistrets (- 108 m). The water caves near Chiren (Ponora, 3172 m long; Mladenovata propast, 1732 m long) are among the favourits to the cavers. Other caves over 500 m long are Toshova dupka near Stoyanovo (1302 m), Mizhishnitsa (885 m), Sokolskata dupka near Lyutadjik (815 m), Gardyuva dupka near Zgorigrad (510 m). The longest of the 130 small caves near Cherepish is Studenata dupka (623 m).

The caves near Lakatnik – the "craddle" of the cavers from Sofia – also belong to the Vratsa Region. Here we find Temnata dupka (4500 m), Kozarskata peshtera (709 m), Razhishkata dupka (316 m) and Svinskata dupka (300 m).

List of terrestrial invertebrates, known from the caves of described area

Protozoa

According to Golemansky (1983) among the protozoans, hitherto found in the Bulgarian caves, there are two groups deserving more special attention. They are the epibiontic infusorians living on the stygobites from the genera *Niphargus*, *Protelsonia*, *Sphaeromides*, etc. and the Gregarinida, parasites in the intestine of the Myriapoda and troglobite insects. All these groups are incompletely known in Bulgaria and elsewhere.

Ciliata

Peritricha

Family Vorticellidae

***Vorticella* sp.**

Temnata dupka (Sf 30) – Tashev & Golemanski (1961: 8). Epibionte.

Suctoria

Family Acinesidae

***Tokophrya* sp.**

Temnata dupka (Sf 30) – Tashev & Golemanski (1961: 8). Epibionte.

Sporozoa

Gregarinida

Family Stylocephalidae

***Lepismatophila plusiocampae* Taschev et Golemansky, 1973**

Endoparasite in *Plusiocampa bureschi*.

Family Stenophoridae

***Stenophora typhloiuli* Golemansky et Taschev, 1973**

Endoparasite in *Typhloiulus bureschi*.

***Stenophora beroni* Golemansky, 1973**

Endoparasite in *Balkanopetalum armatum*.

***Stenophora bulgarosomae* Golemansky, 1973**

Endoparasite in *Bulgarosoma bureschi*.

Nemathelminthes

Nematoda

Dorylaimida

Family Neodiplogasteridae

***Fictor fictor* (Bastian, 1965)**

Svinskata dupka (Sf 33) - (New data, I. Iliev det.).

Family Cephalobidae

***Cephalobius persegnis* Bastian, 1965**

Svinskata dupka (Sf 33) - (New data, I. Iliev det.).

***Eucephalobius mucronatus* (Kozlowska et Wasilewska, 1963)**

Svinskata dupka (Sf 33) - (New data, I. Iliev det.).

***Acrobeloides* sp.**

Svinskata dupka (Sf 33) - (New data, I. Iliev det.).

***Chiloplacus* sp.**

Svinskata dupka (Sf 33) - (New data, I. Iliev det.).

Family Hoplolaimidae

***Helicotylenchus vulgaris* Yuen, 1964**

Svinskata dupka (Sf 33) - (New data, I. Iliev det.).

Family Plectidae

***Plectus* sp.**

Svinskata dupka (Sf 33) - (New data, I. Iliev det.).

Annelida

Oligochaeta

Opistophora

Family Lumbricidae

***Allolobophora biserialis* Černosvitov, 1937**

Ledenika (Vr 17), Medenik (Vr 18) – Černosvitov (1937: 85). Trogloxene.

***Octolasium lacteum* Oerley, 1881**

Temnata dupka (Sf 30) - Guéorguiev & Beron (1962). Troglophile.

***Dendrobaena rubida* (Savigny, 1826)**

(= *D. subrubicunda, Bimastus tenius* - sensu Guéorguiev & Beron, 1962)

Shiroki valog (Sf 58) - Beron & Guéorguiev (1967) Trogloxene.

Mollusca

Most of the molluscs, regularly found in Bulgarian caves, are gastropods belonging

to the families Zonitidae and Hydrobiidae (Riedel, 1975; Angelov, 2000). The predominant terrestrial species in the Bulgarian caves is the troglophile *Oxychilus glaber striarius*.

Gastropoda

Stylommatophora

Family Zonitidae

***Oxychilus* (*Morlina*) *glaber striarius* (Westerlund, 1881)**

Studenata dupka (Vr 3) – Beron (1972). Troglophile.

***Oxychilus* (*Morlina*) *glaber* Rossmaessler, 1835**

Temnata dupka (Sf 30) - Guéorguiev & Beron (1962). Troglophile.

***Oxychilus* (*Riedelius*) *depressus* (Sterki, 1889)**

Ledenishka yama (Vr 35) – Beron (1972). Trogloxene or troglophile.

***Vitrea diaphana* (Studer, 1820)**

Ledenika (Vr 17) – Beron & Guéorguiev (1967) – Beron (1972). Trogloxene.

***Daudebardia* sp.**

Ledenika (Vr 17) - Guéorguiev & Beron (1962).

Family Limacidae

***Lytopelte* (*Liolytopelte*) *bureschi* (H. Wagner, 1934)**

(= *Agriolimax b.*)

Medenik (Vr 18) – Wagner (1934: 55). Trogloxene.

Family Milacidae

***Milax* (*M.*) *kusceri* H. Wagner, 1931**

Temnata dupka (Sf 30) – Urbanski & Wiktor (1967: 86). Trogloxene.

Arthropoda

Crustacea

Isopoda

Andreev (1983) reviewed the distribution of the cave Oniscoidea in Bulgaria. Details on this distribution contain also the papers of Andreev (2000, 2002), Guéorguiev (1977), Beron (1978) and Beron et al. (2011). Isopoda Oniscoidea are known from 185 Bulgarian caves. From 24 genera and 49 species (including 26 troglobites) listed further, 7 genera (*Balkanoniscus, Rhodopioniscus, Bureschia, Bulgaronethes, Bulgaroniscus, Vandeloniscellus, Tricyphoniscus*, all belonging to Trichoniscidae) and 31 species are Bulgarian endemics. Zoogeographically and from the point of view of cave evolution the Isopoda terrestria are among the most important and interesting groups in Bulgarian cave fauna. From 13 families of Isopoda Oniscoidea, known in Bulgaria, only Buddelundiellidae, Tylidae and Stenoniscidae do not contain cave species. With 32 species (including 23 of the 25 troglobites), Trichoniscidae is the family by far the most important among Bulgarian cave Isopoda. The only other troglobites (*Cordioniscus bulgaricus* and *C. schmalfussi*) belong to the family Styloniscidae, but they are not known in Vratza area.

Oniscidea

Family Trichoniscidae

***Hyloniscus riparius* (C.L. Koch, 1838)**

Razhishka yama (Sf 55) - Guéorguiev & Beron (1962); Svinskata dupka (Sf 33),

Ledenika (Vr 17) - Beron & Guéorguiev (1967). Trogloxene.

Trichoniscus anophthalmus Vandel, 1965

Studenata dupka (Vr 3), Ezeroto (Vr 4) – Vandel (1965: 257); Toshova dupka (Vr 42) – Beron (1972). **Troglobite.**

***Trichoniscus bureschi* Verhoeff, 1926**

Zidanka (Sf 29), Temnata dupka (Sf 30), Svinskata dupka (Sf 33), Golemata Vrazha dupka (Sf 35) – Beron & Guéorguiev (1967). Troglophile.

***Bureschia bulgarica* Verhoeff, 1926**

Temnata dupka (Sf 30) - Guéorguiev & Beron (1962); Belyar (Vr 53) – Andreev (1972: 178). **Troglobite.**

***Vandeloniscellus bulgaricus* (Vandel, 1967)**

(= *Cyphoniscellus b.*)

Toshova dupka (= Matnitsa) (Vr 42) – Vandel (1967: 337). Troglobite**.**

***Tricyphoniscus bureschi* Verhoeff, 1936**

Ledenika (Vr 17) – Andreev (2002: 67 - 68). Troglobite.

Family Trachelipidae

***Trachelipus balticus* (Verhoeff, 1907)**

Medenik (Vr 18) - Guéorguiev & Beron (1962). Trogloxene.

Trachelipus squamuliger (Verhoeff, 1907) (= *Trachelipus absoloni* (Strouhal, 1939)

Razhishka yama (Sf 55) - Guéorguiev & Beron (1962). Troglophile.

***Protracheoniscus ubliensis* (Verhoeff, 1901)**

Ledenika (Vr 17) - Beron & Guéorguiev (1967). Trogloxene.

Family Porcellionidae

***Porcellium balkanicum* Verhoeff, 1936**

Ledenika (Vr 17) – Verhoeff (1936: 11). Troglophile.

Arachnida

Among the 15 recent orders of Arachnida 10 are known in Bulgaria. Nine (all except Solifugi) have been found in caves. The scorpions do not live in the deeper part of the Bulgarian caves.

Scorpiones

Family Euscorpiidae

***Euscorpius (E.) deltshevi* Fet, Graham, Webber et Blagoev, 2014**

Tchernija izvor (Vr 91) – Fet et al. (2014: 89 – 90).

***Euscorpius* sp**.

Temnata dupka (Sf 30) – Buresch, Tranteev & Aleksandrov (1949: 9); Razhishkata peshtera (Sf 32) - Guéorguiev & Beron (1962)(all sub *"carpathicus* (Linnaeus, 1767").

Trogloxenes. According to the recent data of V. Fet, *Euscorpius carpathicus* lives only in Romania. The published records of this species in Bulgaria should be refered to other species of *Euscorpius.*

Opiliones

The first cave opilions in Bulgaria have been collected by Dr. Buresch and his team (including from Vrachanska Planina) and published by Roewer (1926). The monograph

of Starega (1976) assessed the number of Bulgarian harvestmens at 44 species (40 + *Platybunus bucephalus* + *Cyphophthalmus [Tranteeva] paradoxus* + 2 species of genus *Siro*) and two subspecies. Up to now 22 species (2 out of 3 Cyphophthalmi, one of Laniatores, 9 of 17 Dyspnoi and 10 of 24 Eupnoi) have been recorded from caves. The material collected in Bulgarian caves and published after the monograph of Starega (1976) by Juberthie (1991), Beron & Mitov (1996) and Mitov (2003) does not change our ideas about the cave representatives of the group. Meanwhile, several papers of Mitov completed the number of Bulgarian Opilions to 63 species. This number includes 5 troglobites: *Tranteeva paradoxa, Siro beschkovi, Paralola buresi, Paranemastoma beroni* and *Paranemastoma bureschi.* The most widespread troglophile in the Bulgarian caves is *Paranemastoma radewi* (sensu Starega, 1976), known from 66 caves. All five troglobite harvestmen are endemic to the actual Bulgarian territory, but *Paranemastoma bureschi* will certainly be found in the caves of the "Western confines" (part of Western Stara Planina, now in Serbia) and *P. beroni* – in the Greek part (Orvilos) of Slavyanka Mt. *Paranemastoma radewi* is known also from Bosnia (Hadži, 1973), and from Northern Greece. The information obtained in the years after 1972, has been published by Beron & Mitov (1996), by Mitov (2004, 2011) and by Beron & Mitov (2011).

Laniatores

Family Phalangodidae

***Paralola buresi* Kratochvil, 1951**

Temnata dupka (Sf 30) – Kratochvil (1958: 382); Zidankata (Sf 29), Svinskata dupka (Sf 33), Kozarskata peshtera (Sf 34) - Beron & Guéorguiev (1967). Troglobite.

Palpatores

Family Trogulidae

***Trogulus tricarinatus* (Linnaeus, 1758)**

Zmeyova dupka III (Vr 33) - Beron & Guéorguiev (1967); Golemata yama (Vr 23) – Starega (1976: 299). Trogloxene.

Family Nemastomatidae

***Pyza bosnica* (Roewer, 1919)**

(= *Nemastoma bosnicum orientale* Kratochvil, 1958)

Zmeyova dupka III (Vr 33) - Beron & Guéorguiev (1967). Trogloxene.

***Paranemastoma* (*P.*) *radewi* (Roewer, 1926)**

(= *Nemastoma radewi* Roewer = *N.* (*Dromedostoma*) *paspalevi* Kratochvil = *N.* (*D.*) *markovi* Kratochvil = *N.* (*D.*) *atanasovi balcanica* Kratochvil – see Starega, 1976)

Radyova propast (Sf 59), Reznyovete (Vr 16), Golemata Mecha dupka (Vr 19), Zmeyova dupka (Vr 25), Garvanets (Vr 31) - Beron & Guéorguiev (1967); cave near Chavkite, Malata Yama (Vr 24), Toshova dupka (Kalna Matnitsa) (Vr 42), Bezimenna (Vr 76) – Starega (1976: 300); Peshtereto (Sf 27), Temnata dupka (Sf 30), Propast 8 (Vr 50) – Beron & Mitov (1996: 18-19). Troglophile.

***Paranemastoma* (*Buresiolla*) *bureschi* (Roewer, 1926)**

Temnata dupka (Sf 30), Ledenika (Vr 17), Medenik (Vr 18) – Roewer (1926: 301), Zidanka (Sf 29) - Guéorguiev & Beron (1962); Yavoretskata peshtera (Sf 25), Sokolskata dupka (Vr 52) – Beron (1994); Ledenishka yama (Vr 35), Malkata Mecha dupka (Vr 27), Haydushka dupka (Vr 83) – Beron & Mitov (1996: 20); Belyar (Vr 53) – Mitov (2011: 303). Troglobite.

Family Phalangiidae

***Leiobunum rumelicum* Šilhavý, 1965**

Reznyovete (Vr 16), Ledenika (Vr 17) – Beron (1994). Regular trogloxene.

***Lacinius horridus* (Panzer, 1794)**

(= *L. gallipoliensis* Roewer, 1923 = *L. dentiger* sensu Beron et Guéorguiev, 1967 - det. incorr.)

Medenik (Vr 18) - Guéorguiev & Beron (1962). Trogloxene.

***Phalangium opilio* Linnaeus, 1758**

Medenik (Vr 18) - Guéorguiev & Beron (1962). Trogloxene.

***Zachaeus crista* (Brullé, 1832)**

Medenik (Vr 18) - Guéorguiev & Beron (1962); Golemata yama (Vr 23) – Beron (1994). Trogloxene.

***Egaenus convexus* (C.L. Koch, 1835)**

Golemata yama (Vr 23) - Beron & Guéorguiev (1967). Trogloxene.

Pseudoscorpiones

From ten familles and 59 species of Pseudoscorpions in Bulgaria two families (Chthoniidae and Neobisiidae) and 16 species are known to inhabit caves (including 7 troglobites). This number is by no means definitive and will certainly increase after the identification of the extensive material collected by us.

Family Chthoniidae

***Chthonius (Chthonius)* sp.**

Family Neobisiidae

***Neobisium* (*Heoblothrus*) *beroni* Beier, 1963**

Svinskata dupka (Sf 33) – Beier (1963: 133); Kozarskata peshtera (Sf 34), P. Beron leg. et det.; B. Petrov leg. et det. Troglobite.

***Balkanoroncus hadzii* Harvey, 1990**

(= *Roncus bureschi* Hadzi, 1940)

Razhishka peshtera (Sf 32) – Hadzi (1940: 34); Harvey (1990: 331). Troglobite.

***Roncus lubricus* L. Koch, 1873**

Yavoretskata peshtera (Sf 25) - Guéorguiev & Beron (1962). Troglophile.

***Roncus mahnerti* Ćurčić et Beron, 1981**

Vodnata dupka (Vr 74) – Ćurčić & Beron (1981: 70). Troglobite.

Araneae

Recently Deltshev, Lazarov & Petrov (2003), Deltshev & Petrov (2008) and Deltshev et al. (2011) actualized the number of the cave spiders in Bulgaria to 99 (about 10% of the total number of spider species of the country. However, the overall picture did not change too much and the number of the troglobitic spiders remained feeble. From the caves of Vrachanski Balkan and Lakatnik have been recorded 21 sp. of spiders, incl. three (conditional) troglobites: *Protoleptoneta bulgarica, Centromerus bulgarianus* and *Porrhomma convexum.*

Araneomorpha

Family Pholcidae

***Hoplopholcus forskali* (Thorell, 1871)**

"Propastta near Cherepish" – Drensky (1931: 12), Vodna dupka (Vr 70) – Beron (1994). Regular trogloxene.

***Pholcus opilionoides* (Schrank, 1781)**

Temnata dupka (Sf 30) - Guéorguiev & Beron (1962). Regular trogloxene.

***Pholcus phalangioides* (Fuessli, 1775)**

Temnata dupka (Sf 30) - Guéorguiev & Beron (1962). Trogloxene.

Family Nesticidae

***Nesticus cellulanus* (Clerck, 1757)**

Studenata dupka (Vr 3) - Guéorguiev & Beron (1962), Propastta (Vr 80), Zdraveshka dupka (Sf 72) – Beron (1994). Troglophile.

***Nesticus* sp.**

Temnata dupka (Sf 30) – Buresch, Tranteev & Aleksandrov (1949: 9).

Family Araneidae

***Araneus diadematus* Clerck, 1757**

Ledenika (Vr 17) – Delchev (1982: 101). Trogloxene.

Family Leptonetidae

***Protoleptoneta bulgarica* Deltchev, 1972**

Grebenyo (Mt 18), Dupna mogila (Vr 34) – Deltshev (1972: 282) – Beron (1994). Troglobite.

Family Tetragnathidae

***Meta menardi* (Latreille, 1804)**

Vratnik (Vr 65), Yarkovets (Sf 77), Temnata dupka (Sf 84), Ledenika (Vr 17). Troglophile.

***Metellina merianae* (Scopoli, 1763)**

Vratnik (Vr 65), Radyova propast (Sf 59) – Beron (1994); Mechata dupka (Sf 24). Troglophile.

Family Linyphiidae

***Antrohyphantes sofianus* (Drensky, 1931)**

(syn. *Lepthyphantes s.*, syn. *L. tranteevi* Miller, 1958)

Suhata yama (Sf 44), Radyova propast (Sf 59), Zdraveshka dupka (Sf 72) – Beron (1994); Temnata dupka (Sf 84), Svinskata dupka (Sf 33) – Deltchev, Lazarov & Petrov (2003: 14). Troglophile.

***Centromerus bulgarianus* (Drensky, 1931)**

(= *Troglohyphantes balcanica* Drensky, 1931)

Razhishka peshtera (Sf 32) – Drensky (1931: 26); Zidanka (Sf 29) – Beron (1994); **New:** Barkite 8 (Vr 49) – 1 ♂, 1 ♀., 31.10.2004, P. Beron leg.(Hr. Delchev det.). Troglobite.

***Centromerus lakatnikensis* (Drensky, 1931)**

Razhishka peshtera (Sf 32) – Drensky (1931: 25). Troglophile.

***Lepthyphantes leprosus* (Ohlert, 1865)**

Temnata dupka (Sf 30), Yavoretskata peshtera (Sf 25), Razhishkata peshtera (Sf 32) – Drensky (1931: 14); Princhovitsa (Vr 72), Serapinovata peshtera (Vr 5), Ledenika (Vr 17), Toshina (Toshova) dupka (Vr 42). Regular trogloxene.

***Lepthyphantes centromeroides* Kulczynski, 1914**

(= *Troglohyphantes bureschi* Drensky, 1931)

Ledenika (Vr 17) – Drensky (1931: 21). Troglophile.

***Microneta viaria* (Blackwall, 1841)**

Razhishka peshtera (Sf 32) – Drensky (1931: 33). Trogloxene.

***Porrhomma convexum* (Westring, 1861)**

(= *Porrhomma rosenhaueri* L. Koch = *P. errans* (Blackwall) sensu Drensky, 1931 = *P. profundum* Dahl sensu Guéorguiev et Beron, 1962)

Garvanets (Vr 31), Toshova dupka (Vr 42) – Beron (1994). Troglobite.

***Porrhomma* sp.**

Temnata dupka (Sf 30) – Buresch, Tranteev & Aleksandrov (1949: 9).

***Ceratinopsis romana* (Cambridge, 1872)**

Ledenika (Vr 17) – Delchev (1982: 102). Trogloxene.

***Thyreosthenius parasiticus* (Westring, 1851)**

Haydushkata dupka (Sf 69) – Delchev (1982: 102). Trogloxene.

Family Agelenidae

***Inermocoelotes jurinitschi* (Drensky, 1915)**

Haydushkata dupka (Vr 73) – Deltchev (1973b: 41). Trogloxene.

***Tegenaria domestica* (Clerck, 1757)**

(= *Amaurobius erberi* sensu Drensky, 1931)

Temnata dupka (Sf 30), Razhishka peshtera (Sf 32), Studenata dupka (Vr 3) – Drensky (1931: 12); Serapionovata peshtera (Vr 5), Princhovitsa (Vr 72), Sveti Kirik (Vr 75) – Beron (1994). Regular trogloxene.

***Tegenaria silvestris* L. Koch, 1872**

Vratnik (Vr 65) – Beron (1994). Regular trogloxene.

Family Gnaphosidae

***Echemus rhenanus* Bertkau, 1883**

Razhishka peshtera (Sf 32) – Drensky (1931: 36). Trogloxene.

Acaromorpha

Terrestrial mites of Bulgarian caves are not yet well known, especially the free-living forms. There is a provisional ecological subdivision (Beron, 1978: 207) in 4 categories: obligate parasites in all stages (Sarcoptidae, Myobiidae, Psorergatidae, Listrophoroidea, Spinturnicidae, etc. These mites are listed here only for completeness, they are not real cave animals); parasites having some parasitical or commensal stages and some free-living stages (Trombiculidae, Trombidiidae s.l., Ixodidae, Argasidae, some Acaridida and Mesostigmata; such species are listed here); saprophages (Oribatida, some Tyroglyphoides, etc.); predators (most of the free-living Prostigmata - Rhagidiidae, Labidostomidae and others). Many mites live in the guano. In the list below the obligatory parasites are enumerated only for the record, without mentioning the caves in which they live.

Acariformes

Prostigmata

Family Myobiidae

Parasites of Chiroptera, not part of the cave fauna (after Beron, 1973, 1974, 2007). *Pteracarus pipistrellius* (Radford, 1938), *P. submedianus* Dusbábek, 1963, *P. minutus*

(Radford, 1940)

Acanthophthirius emarginatus (Dusbábek, 1963), *A. myoti* (Dusbábek, 1963), *A. mystacinalis* (Radford, 1935), *A. pantopus* (Poppe et Trouessart, 1895), *A. etheldredae* Perkins, 1925, *A. klapaleki* (Dusbábek, 1963), *A. bohemicus* Dusbábek, 1963

Neomyobia rollinati (Poppe, 1908), *N. chiropteralis* (Michael, 1884), *N. slovenica* Dusbábek, 1968

Family Trombiculidae

Parasites of Chiroptera; the adults are found on the floor of caves.

***Oudemansidium komareki* (Daniel et Dusbábek, 1959)**

(= *Leptotrombidium k.*)

Razhishka dupka (Sf 32), ex *Pipistrellus pipistrellus* and *Plecotus austriacus* - Kolebinova & Beron (1965: 72).

***Pentagonaspis* (*Dusbabekia*) *trajani* (Dusbábek, 1964)**

(= *Neotrombicula trajani*)

Temnata dupka (Sf 30), Razhishkata peshtera (Sf 32), ex *Pipistrellus pipistrellus* and *Plecotus austriacus* - Dusbábek (1964), Kolebinova et Beron (1965: 74).

***Leptotrombidium russicum* (Oudemans, 1902)**

Razhishka dupka (Sf 32), Temnata dupka (Sf 30) – Dusbábek, 1964: 16.

***Leptotrombidium myoticulum* (Feider, 1968)**

(= *Eltonella* (*Marcandrea*) *myoti*)

Razhishka dupka (Sf 32) - Kolebinova & Beron (1965: 78).

***Riedlinia* (*R.*) *europaea* Kolebinova et Beron, 1965**

Dupna mogila (Vr 34), ex *Rhinolophus hipposideros* (Kolebinova & Beron, 1965: 77).

***Willmannium bulgaricum* (Dusbábek, 1964)**

Razhishka dupka (Sf 32), ex *Pipistrellus pipistrellus* – Dusbábek (1964); Kolebinova & Beron (1965: 72).

Acaridida

Family Rosensteiniidae

***Chiroptoglyphus bulgaricus* (Dusbábek, 1964)**

Temnata dupka (Sf 30), Razhishkata dupka (Sf 32) - Dusbábek (1964a: 226). Parasite of Chiroptera.

Family Chirodiscidae

Parasites of Chiroptera, not part of the cave fauna (after Beron, 1974, 2007).

Labidocarpus rollinati Trouessart, 1895

Olabidocarpus belsorum belsorum (van Eyndhoven, 1940)

Alabidocarpus megalonyx megalonyx (Trouessart, 1895), *A. calcaratus* Lawrence, 1952, *A. intercalatus* Fain, 1971, *A. minor* (Rollinat et Trouessart, 1897)

Family Sarcoptidae

Parasites of Chiroptera, not part of the cave fauna (after Beron, 1970, 1973, 1974, 2007).

Nycteridocoptes poppei (Oudemans, 1897), *N. eyndhoveni* Fain, 1959, *N. miniopteri* Fain, 1959

Notoedres (*N.*) *plecoti* Fain, 1959, *N.* (*N.*) *chiropteralis* (Trouessart, 1896)

Parasitiformes

Mesostigmata

Gamasina

Family Parasitidae

***Pergamasus* sp.**

Propastta (Vr 27) - Guéorguiev & Beron (1962).

Family Macronyssidae

Parasites of Chiroptera (after Beron, 1968, 2007).

Ichoronyssus scutatus (Kolenati, 1856)

Macronyssus cyclaspis (Oudemans, 1906), *M. ellipticus* (Kolenati, 1856), *M. flavus* (Kolenati, 1856), *M. granulosus* (Kolenati, 1856), *M. uncinatus* (Canestrini, 1885) (= *M. rhinolophi* (Oudemans))

Steatonyssus spinosus Willmann, 1936, *S. periblepharus* Kolenati, 1858

Family Spinturnicidae

Parasites of Chiroptera (after Beron & Kolebinova, 1964; Beron, 1968, 1973, 2007).

Eyndhovenia euryalis (Canestrini, 1884)

Paraperiglischrus rhinolophinus (C.L. Koch, 1841)

Spinturnix mystacina (Kolenati, 1857), *S. myoti* (Kolenati, 1856), *S. emarginata* (Kolenati, 1856), *Spinturnix psi* (Kolenati, 1856), *Spinturnix plecotina* (C.L. Koch, 1839)

Ixodida

Parasites of Chiroptera.

Family Argasidae

***Argas vespertilionis* (Latreille, 1802)**

Temnata dupka (Sf 30) - Guéorguiev & Beron (1962); Razhishkata peshtera (Sf 32) - Beron & Guéorguiev (1967). Parasite..

Family Ixodidae

***Ixodes* (*Eschatocephalus*) *vespertilionis* C.L. Koch, 1844** – free living males found also in caves.

Temnata dupka (Sf 30), Razhishkata peshtera (Sf 32) - Beron & Guéorguiev (1967). Parasite.

***Ixodes* (*Pomerantzevella*) *simplex simplex* Neumann, 1906**

(= *I. pospelovae* Emtschuk, 1955)

Razhishkata peshtera (Sf 32) - Beron & Guéorguiev (1967). Parasite (mainly on *Miniopterus schreibersi*).

Myriapoda

Chilopoda

We know now 44 species of this group, living in Bulgarian caves (out of 105 species of Chilopoda in Bulgaria). The progress is evident when we compare this figure to the 6 species listed in our first Essai (Guéorguiev & Beron, 1962). The ecological categories of Chilopoda are only provisory, as we know very little on the biology of these animals. Among the 6 - 7 "troglobite" species (all belonging to order Lithobiomorpha, fam. Lithobiidae) two

are of special interest. *Lithobius lakatnicensis*, longtime considered "endemic" for the caves near Lakatnik, in fact proved to be a species with a distribution amazingly large for a troglobite. Being the only troglobitic *Lithobius* in West Bulgaria and in the Rhodopes, it is "replaced" in Central Stara Planina and in Southeast Bulgaria by other species.

Lithobiomorpha

Family Lithobiidae

***Eupolybothrus transsylvanicus* (Latzel, 1882)**

Zidanka (Sf 29) – Beron (1994); Studenata dupka (Vr 3) – Stoev (2001: 49). Troglophile or regular trogloxene.

***Lithobius* (*L.*) *agilis* C.L. Koch, 1862**

Reznyovete (Vr 16) – Stoev (2002: 24). Troglophile.

***Lithobius* (*L.*) *lakatnicensis* Verhoeff, 1926**

(syn. *L. gueorguievi* Demange, 1961)

Temnata dupka (Sf 30) – Verhoeff (1926b: 295); Svinskata dupka (Sf 33) – Demange (1961: 179), Zidanka (Sf 29) – Negrea (1965: 96); Grebenyo (Mt 18), Toshova dupka (Vr 42) – Stoev & Ribarov (1995: 93). Troglobite.

***Lithobius* (*L.*) *schuleri* Verhoeff, 1925**

(= *L. borisi rylaicus* Verhoeff, 1928, fide Stoev, 2002 = *L. erythrocephalus* et *L. erythrocephalus borisi* sensu Beron, 1994)

Serapionovata peshtera (Vr 5) – Stoev & Ribarov (1995: 92); Stoev (2002: 38). Trogloxene.

***Lithobius* (*L.*) *viriatus* Sselivanoff, 1878**

Reznyovete (Vr 16) – Stoev (2001: 43). Regular trogloxene.

***Lithobius* (*Sigibius*) *micropodus* (Matic, 1980)**

(= *microps,* nec Meinert, 1868)

Cherniya Izvor (Vr 91) – Stoev (2001: 44). Troglophile.

***Harpolithobius anodus anodus* (Latzel, 1880)**

Temnata dupka (Sf 8), Zhabokreshka yama (Vr 71), Reznyovete (Vr 16) – Stoev (2001: 45-46). Troglophile or regular trogloxene.

Geophilomorpha

Family Linotaeniidae

***Strigamia crassipes* (C.L. Koch, 1835)**

Ledenika (Vr 17) – Matic (1967: 235). Trogloxene.

Family Dignathodontidae

***Henia illyrica* (Meinert, 1870)**

Temnata dupka (Sf 30) – Stoev (2001: 32). Trogloxene.

Scolopendromorpha

Family Cryptopidae

***Cryptops anomalans* Newport, 1844**

Medenik (Vr 18) – Stoev (2001: 33). Trogloxene.

Diplopoda

Thanks mostly to the works of Verhoeff, Strasser, Gulička and Stoev now we know the essential on Bulgarian cave Diplopoda. From 113 species of Diplopoda known in Bulgaria

(Strasser, 1973, 1975, etc.), 60 species have been found in caves.

Very important groups of Bulgarian cave Diplopoda are the order Chordeumatida (Ascospermophora) and the Typhloiulini (*Typhloiulus* and *Serboiulus*). The particularities of their distribution have been analysed in details by Strasser (1969, 1973) and Beron (1978). We should note that among the many *Trachysphaera* from Bulgarian caves only *T. lakatnicensis* is to be considered troglobite.

Glomerida

Family Glomeridae

***Glomeris pustulata* Latreille, 1804**

(*Glomeris pustulata diminuta* Attems = *Glomeris vodnatensis* Verhoeff, 1926, syn., see Mauriès, Golovatch & Stoev, 1997, Zoosystema, Paris, 19: 260).

Temnata dupka (Sf 30), Sedmovratitsa (Sf 36) - Beron & Guéorguiev (1967). Trogloxene.

Family Doderiidae

***Trachysphaera costata* (Waga, 1857)**

Gornata dupka (Sf 60) - Beron & Guéorguiev (1967). Troglophile.

***Trachysphaera lakatnicensis* Tabacaru, 1979**

Svinskata dupka (Sf 33), Zidanka (Sf 29) - Guéorguiev & Beron (1962); Sedmovratitsa (Sf 36) - Beron & Guéorguiev (1967); Svardelo (Sf 26), Kozarskata peshtera (Sf 34) – Beron (1972).Troglobite.

***Trachysphaera* sp.**

Toshova dupka (Vr 42), Chetvartitata dupka (Vr 89) - Stoev (2004: 146).

Polydesmida

Family Polydesmidae

***Polydesmus renschi* Schubart, 1934**

Ledenika (Vr 17) - Beron & Guéorguiev (1967). Trogloxene.

***Polydesmus tridens* Attems, 1951**

"Cave Gornata Rudina near Vratsa"(?) – Attems (1959: 337). Troglophile ?

***Brachydesmus* sp.**

Serapionovata peshtera (Vr 5) - Beron & Guéorguiev (1967).

Family Trichopolydesmidae (Bacillidesmidae)

***Bacillidesmus bulgaricus bulgaricus* Strasser, 1962**

Mladenovata peshtera (Vr 30) - Beron & Guéorguiev (1967). Troglobite.

Family Paradoxosomatidae

***Strongylosoma stigmatosum* (Eichwald, 1830)** subsp**. *balcanicum* Schubart, 1934**

(= *Str. pallipes balcanicum* Schubart, 1934).

Ledenika (Vr 17) - Beron & Guéorguiev (1967); Malkata peshtera (Vr 92) – Stoev (2004: 149). Trogloxene.

Chordeumatida

Family Anthroleucosomatidae

***Bulgarosoma bureschi* Verhoeff, 1926**

Ledenika (Vr 17) – Verhoeff (1926b: 295); Malkata Mecha dupka (Vr 27) – Botosaneanu,

Decu & Rusu (1964: 420); Nevestina propast (Vr 7), Kitova kukla (Sf 38), Reznyovete (Vr 16) - Beron & Guéorguiev (1967); Belyar (Vr 53) – Beron (1972). Troglobite.

Callipodida

Family Schizopetalidae

***Balkanopetalum armatum* Verhoeff, 1926**

Studenata dupka (Vr 3) – Verhoeff (1926c: 61); Serapionovata peshtera (Vr 5) Beron & Guéorguiev (1967); Shishmanovets (Vr 64) – Beron (1972); Peshtereto (Sf 27) - Troglophile.

Julida

Family Julidae

***Typhloiulus* (*Typhloiulus*) *bureschi* Verhoeff, 1926**

(incl. var. *obscurus* Strasser, 1966)

Temnata dupka (Sf 30) – Verhoeff (1926a: 76); Svinskata dupka (Sf 33), Razhishka yama (Sf 55), Zidanka (Sf 29) - Guéorguiev & Beron (1962); Sipo (Vr 29) - Beron & Guéorguiev (1967); Toshova dupka (Vr 42) – Beron (1972: 299, K. Strasser det.); Razhishkata peshtera (Sf 32) – Stoev (2004: 150). Troglobite.

***Typhloiulus* (*Inversotyphlus*) *longipes* Strasser, 1973**

Belyar (Vr 53) – Strasser (1973: 434). Troglobite.

***Typhloiulus* sp.**

Labirinta (Vr 93) – Stoev (2004: 150).

***Balkanophoenix borisi* Verhoeff, 1937**

Razhishka peshtera (Sf 32) – Verhoeff (1937: 113). Trogloxene (?).

Insecta s. lato

In the modern classifications some researchers follow the system in which Protura and Collembola form the class Ellipura, the Diplura are a separate class and all other former insects form the class Insecta with infraclasses Thysanura and Pterygota.

Collembola

Among the 165 species of Collembola in Bulgaria (Thibaud, 1995), 53 have been found in caves, and many of them only there. After Massoud & Thibaud (1977)*, it is useless to apply the notion of "trogloxene" for characterising a spring-tail, taking into account that all Collembola are able to reproduce both in caves and outside them.

*Essai de classification des Collemboles "cavernicoles" européens. Proc. 6th Intern. Congr. Spel., Acad. Praha, V, p.141-157. If we accept this view point, Collembola will appear as the only group of cave animals having no trogloxenes.

Family Hypogastruridae

***Bonetogastrura cavicola* (Börner, 1901)**

(= *Hypogastrura c.*)

Ledenika (Vr 17), Medenik (Vr 18) - Guéorguiev & Beron (1962), Chavkite (Sf 41) – Thibaud (1995: 22). Hemiedaphic-troglophile.

***Ceratophysella armata* (Nicolet, 1841)**

Chavkite (Sf 41), Kalnata dupka (Vr 40), Toshova dupka (Vr 42) – Beron (1972); Reznyovete (Vr 16) – Beron (1994). Troglophile-guanophile.

Family Onychiuridae

***Deuteraphorura ghidinii* (Denis, 1938)**

Temnata dupka (Sf 30) - Beron & Guéorguiev (1967); Mecha dupka (Sf 70) – Beron (1972). Troglophile.

***Allonychiurus sensitivus* (Handschin, 1928)**

Ledenika (Vr 17) - Guéorguiev & Beron (1962). Troglobite.

***Onychiuroides bureschi* (Handschin, 1928)**

Ledenika (Vr 17) - Guéorguiev & Beron (1962). Troglophile.

***Onychiuroides postumicus* (Bonet, 1931)**

Svinskata dupka (Sf 33) - Guéorguiev & Beron (1962), Troglophile.

***Onychiuroides subgranulosus* (Gama, 1964)**

Lednitsata (Vr 47) – Beron (1972). Troglophile.

Family Isotomidae

***Heteromurus nitidus* (Templeton, 1835)**

(= *H. n. margaritaria* Wankel, 1860)

Kozarskata peshtera (Sf 24), Zidanka (Sf 29) - Guéorguiev & Beron (1962); Temnata dupka (Sf 30) - Beron & Guéorguiev (1967); Ledenika (Vr 17), Zmeyova dupka (Vr 25) – Thibaud (1995: 24). Troglophile.

***Heteromurus nitidus quadriocellatus* Ksenemann, 1935**

Yavoretskata peshtera (Sf 25) – Beron (1994). Troglophile.

***Orchesella vilosa* (Geoffroy, 1764) (var. *devergens* Handschin)**

Temnata dupka (Sf 30) - Guéorguiev & Beron (1962). Troglophile.

***Pseudosinella duodecimocellata* Handschin, 1928**

Temnata dupka (Sf 30), Ledenika (Vr 17) – Handschin (1928: 24); Lednitsata (Vr 47) – Beron (1972); Yavoretskata peshtera (Sf 25) – Beron (1994); Razhishka peshtera (Sf 32) – Thibaud (1995: 25). Troglobite.

***Pseudosinella wahlgreni* Börner, 1907**

Propastta (Vr 27) - Guéorguiev & Beron (1962). Troglophile.

Family Tomoceridae

***Tomocerus vulgaris* (Tullberg, 1891)**

Razhishka yama (Sf 55) - Beron & Guéorguiev (1967). Troglophile.

Diplura

The members of Campodeidae (Diplura) are numerous in Bulgarian caves. Part of the material collected was recently published by C. Bareth and B. Condé. It is to note that the troglobite *Plusiocampa bulgarica* is found in the caves of Stara Planina and the Rhodopes – considerable disjunction for a troglobite. The Japygidae are rare in Bulgarian caves.

Family Campodeidae

***Campodea* (*Dicampa*) *frenata* Silvestri, 1931**

Yavoretskata peshtera (Pz 1) - Guéorguiev & Beron (1962). Troglophile (?).

***Plusiocampa (Stygiocampa) bulgarica* Silvestri, 1931**

Yavoretskata peshtera (Sf 25) - Silvestri (1931: 107). Troglobite.

***Plusiocampa (Stygiocampa) bureschi* Silvestri, 1931**

(= *Plusiocampa rauseri* Rusek, 1965)

Temnata dupka (Sf 30), Razhishkata peshtera (Sf 32) – Silvestri (1931: 103);

Kozarskata peshtera (Sf 34), Svinskata dupka (Sf 33), Prohodnata vrazha dupka (Sf), Zidankata (Sf 29), Pyasachnata dupka (Sf 49), Sedmovratitsa (Sf 36), Propastta (Sf) – Bareth & Condé (2002: 10 -12).

Locus typicus of *Plusiocampa rauseri*: Razhishkata peshtera (Sf 32) - Beron & Guéorguiev (1967). Troglobite.

Insecta

Thysanura

Microcoryphia

Family Machilidae

***Trigoniophthalmus banaticus* Verhoeff, 1910**

Ledenika (Vr 17) - Guéorguiev & Beron (1962). Trogloxene.

Pterygota

Heteroptera

Family Nabidae

***Himacerus myrmecoides* Costa, 1834**

Pyasachnata dupka (Sf 49) - Guéorguiev & Beron (1962). Occasional trogloxene.

Coleoptera

From the 12 families of beetles recorded so far from Bulgarian caves only three contain troglobites (about one third of all Bulgarian troglobites). The most typical are Carabidae (43 sp., 23 troglobitic species). Among them are the genera *Pheggomisetes, Rambousekiella* and *Paralovricia* (endemic to Bulgaria) and *Duvalius* (17 cave inhabiting endemic species). Another important group of cavernicolous species are the Leiodidae (Cholevidae), with 29 species in Bulgarian caves, including at least 26 troglobites. This group contains many endemic genera: *Beskovia, Beronia, Netolitzkya, Hexaurus, Beroniella, Radevia (=Vratzaniola), Genestiellina, Bureschiana, Rhodopiola, Bulgariella (= Tranteeviella), Gueorguieviella, Balcanobius.* Important part of the cave fauna are also the troglophiles and the guanobites (*Trechus, Laemostenus, Catops, Choleva, Nargus, Quedius, Atheta,* etc.).

Family Carabidae

***Trechus quadristriatus* (Schrank, 1781)**

Princhovitsa (Vr 72) – Beron (1994). Trogloxene - muscicole.

***Duvalius* (*Paraduvalius*) *beroni* Guéorguiev, 1971**

Toshova dupka (Vr 42) - Guéorguiev (1971: 161). Troglobite.

***Duvalius* (*Paraduvalius*) *papasoffi* Mandl, 1942**

Temnata dupka (Sf 30) – Mandl (1942: 253); Zidanka (Sf 29), Pyasachnata dupka (Sf 59) - Beron & Guéorguiev (1967). Troglobite.

***Duvalius* (*Paraduvalius*) *zivkovi* Knirsch, 1925**

Ledenika (Vr 17) – Knirsch (1925: 88); Malkata Mecha dupka (Vr 27) - Beron & Guéorguiev (1967); Barkite 8 (25 godini Akademik) (Mt 49) – Dupré (2000: 166); Malkata Nevestina propast (Vr 43) - Beron & Guéorguiev (1967), sub "*Duvalius* (*Paraduvalius*) *zivkovi deltshevi* Guéorguiev, 1965", cf. Guéorguiev, 2004c: 96). Troglobite.

***Duvalius* (*Paraduvalius*) sp.**

Zidanka (Sf 29), Pyasachnata dupka (Sf 49) - Guéorguiev & Beron (1962).

***Pheggomisetes buresi buresi* Knirsch, 1923**

Ledenika (Vr 17) – Knirsch (1923: 5); Ledenishka yama (Vr 35), Reznyovete (Vr 16), Malkata Mecha dupka (Vr 27), Golemata Mecha dupka (Vr 19), Nevestina propast (Vr 7), Pesopin Kamak (Vr 36), Zmeyova dupka (Vr 25), Malata yama (Vr 23), Radyova propast (Sf 59), Chavkite (Sf 41) – Guéorguiev (1964: 269-270); Zmeyova dupka II (Vr 32), Kalnata dupka (Vr 40), Malkata Nevestina propast (Vr 43) - Beron & Guéorguiev (1967); Barkite 8 (25 godini Akademik) (Mt 49) – Dupré (2000: 166). **New**: Mizhishnitsa Cave (Vr 97), 01.05.2010; Duglaska (Vr 98), 02.05.2010, P. Beron leg., B. Guéorguiev det. Troglobite.

***Pheggomisetes buresi medenikensis* Knirsch, 1924**

Medenik (Vr 18) – Knirsch (1924: 63). Troglobite.

***Pheggomisetes globiceps georgievi* Z. Karaman, 1958**

Yamata (Sf 40) - Z. Karaman (1958: 224). Troglobite.

***Pheggomisetes globiceps lakatnicensis* Jeannel, 1928**

Temnata dupka (Sf 30) – Jeannel (1928: 224); Zidanka (Sf 29), Svinskata dupka (Sf 33), Radyova propast (Sf 59), Kolkina dupka (Sf 28), Golemata Mecha dupka (Vr 19)- Beron & Guéorguiev (1967). Troglobite.

***Pheggomisetes globiceps stoicevi* Guéorguiev, 1964**

Nevestina propast (Vr 7) - Beron & Guéorguiev (1967). Troglobite.

***Pheggomisetes globiceps mladenovi* Guéorguiev, 1964**

Malkata Mecha dupka (Vr 27) - Guéorguiev (1964: 274); Barkite 8 (25 godini Akademik) (Mt 49) – Dupré (2000: 166). Troglobite.

***Pheggomisetes radevi radevi* Knirsch, 1924**

Ledenika (Vr 17) - Knirsch (1924: 166). Troglobite.

***Pheggomisetes radevi ilcevi* Knirsch, 1924**

Medenik (Vr 18) – Knirsch (1924: 63). Troglobite.

***Pheggomisetes radevi tranteevi* Guéorguiev, 1964**

Suhata yama (Sf 44) - Guéorguiev (1964: 273). Troglobite.

***Rambousekiella ledenikensis* Knirsch, 1925**

Ledenika (Vr 17) - Knirsch (1925: 87); Grebenyo (Mt 18) – Beron (1972). Troglobite.

***Procrustes coriaceus kindermanni* Walt, 1838**

Razhishka yama (Sf 55) - Guéorguiev & Beron (1962). Trogloxene.

Family Dytiscidae

Rhantus* (*Rhantus*) *latitans Sharp, 1882

Mladenovata peshtera (Vr 30) - Beron & Guéorguiev (1967). Trogloxene.

Family Staphylinidae

***Conosoma testaceum* Fabricius, 1775**

Golemata dupka (Vr 42) – Beron (1994). Trogloxene.

***Atheta* (*Atheta*) *macroptera* Bernhauer, 1913**

Princhovitsa (Vr 72) – Beron (1994). Troglophile-guanobite.

***Atheta* (*Atheta*) *macroptera dinarica* Jeannel et Jarrige, 1949**

Zidanka (Sf 29) - Guéorguiev & Beron (1962). Guanobite.

***Atheta* (*Xenota*) *spelaea* (Erichson, 1839)**

Temnata dupka (Sf 30) - Guéorguiev & Beron (1962). Troglophile.

***Atheta* (*Megista*) *graminicola* Gravenhorst, 1805**

Temnata dupka (Sf 30) - Guéorguiev & Beron (1962). Trogloxene.

Subfamily Pselaphinae

***Bryaxis* (*Erychobythus*) *beroni* Z. Karaman, 1969**

Garvanets (Vr 31) – Z. Karaman (1969: 60); Toshova dupka (Vr 42) – Beron (1972). Regular trogloxene.

Family Endomychidae

***Mycetaea hirta* Marsham, 1802**

Toshova dupka (Vr 42) – Beron (1972). Troglophile.

Family Cryptophagidae

***Micrambe translatus* (Grouvelle, 1916)**

Temnata dupka (Sf 30), Razhishka peshtera (Sf 32) – Beron (1972). Troglophile (?).

***Cryptophagus scutellatus* Newmann, 1834**

Temnata dupka (Sf 30), Razhishka peshtera (Sf 32) – Beron (1972). Trogloxene (lucifuge).

Family Leiodidae (Cholevidae)

Cholevinae

Cholevini

***Catops coracinus* (Kellner, 1846)**

Golemata yama (Vr 23) – Beron (1972). Trogloxene.

***Catops picipes* (Fabricius, 1792)**

Ledenika (Vr 17) – Beron (1972). Trogloxene (?).

***Choleva* (*Ch.*) *agilis* (Illiger, 1789)**

Studenata dupka (Vr 3), Ezeroto (Vr 4) - Guéorguiev & Beron (1962); Bulina dupka (Vr 38) – Beron (1972); Kalnata dupka (Vr 40). Subtroglophile.

Leptodirini

***Beskovia bulgarica* Guéorguiev, 1960**

Studenata dupka (Vr 3) - Guéorguiev (1960: 723); Serapionovata peshtera (Vr 5) – Giachino & Guéorguiev (1996: 253). Troglobite.

***Beskovia beroni* Giachino et Guéorguiev, 2008**

Kozarskata peshtera (Sf 34) - Giachino & Guéorguiev (2008: 86). Troglobite.

***Radevia hanusi* Knirsch, 1925** (=*Vratzaniola pandurskii* Dupré, 2000)

Ledenika (Vr 17) (Knirsch, 1925a: 63); Bezimenna (Vr 86), Zmeyova dupka III (Vr 33), Zmeyova dupka I (Vr 25), Golyamata Mecha dupka (Vr 19), Radyova propast (Sf 59) – Giachino & Guéorguiev (1996: 253); Barkite 8 (25 godini Akademik) (Mt 49), Barkite No 9 (Vr 84) – Dupré (2000: 166, sub "*Vratzaniola pandurskii* Dupré, 2000"). Troglobite.

Hymenoptera

Parasitica

Family Ichneumonidae

***Diphyus quadripunctorius* (Müller, 1776)**

(= *Amblyteles bipunctatus* Rudow, 1888)

Razhishka peshtera (Sf 32) - Guéorguiev & Beron (1962). Regular trogloxene.

***Amblyteles* sp.**

Reznyovete (Vr 16) – Botosaneanu, Decu & Rusu (1964: 420).

The species *"Amblyteles connata, A. multifasciata, A. subfasciata",* mentioned by Buresch (1934), remain doubtful.

Siphonaptera

Family Ischnopsyllidae

***Ischnopsyllus* (*Ischnopsyllus*) *octactenus* (Kolenati, 1857)**

Temnata dupka (Sf 30) - Guéorguiev & Beron (1962); Razhishka dupka (Suhata peshtera) (Sf 32) – Hůrka (1970: 11). Parasite.

***Nycteridopsylla* (*Nycteridopsylla*) *eusarca* Dampf, 1908**

Temnata dupka (Sf 30) - Guéorguiev & Beron (1962). Parasite.

Nycteridopsylla* (*N.*) *ancyluris johanae Hůrka, 1970

Razhishka dupka (Sf 32) - Hůrka (1970: 21). Parasite.

***Nycteridopsylla* (*Aneptescopsylla*) *trigona balcanica* Hůrka, 1965**

Temnata dupka (Sf 30), Razhishka peshtera (Sf 32) – Hůrka (1965: 498). Parasite.

Diptera

So far 17 families of Diptera have been recorded from Bulgarian caves (altogether 60 species plus 8 Pupiparae). This group does not contain troglobites, but many representatives of the families Limnobiidae, Mycetophilidae, Dolichopodidae, Phoridae, Heleomysidae, Sphaeroceridae and Drosophilidae form important component of the parietal and guano fauna. The main source of our knowledge on these families in Bulgaria are the papers of Czerny (1930), Burghele-Balacesco (1966), Beshovski (1972) and Langourov (2001, 2011). Some information on flies, identified by other specialists, contain also the papers of Guéorguiev & Beron (1962), Hazelton (1970), Beron (1994) and others. Special group (Pupiparae) consists of the families Nycteribiidae and Streblidae (parasites of bats). They have been studied by Hůrka (1958, 1962), Skuratowicz (1970), Novosad et al. (1987).

Nematocera

Family Limoniidae

***Limonia nubeculosa* (Meigen, 1804)**

Reznyovete (Vr 16), Ledenika (Vr 17), Golemata Mecha dupka (Vr 19), Malkata Mecha dupka (Vr 27) - Beron & Guéorguiev (1967). Subtroglophile.

Family Mycetophilidae

***Speolepta leptogaster* (Winnertz, 1863)**

Mladenovata peshtera (Vr 30) - Beron & Guéorguiev (1967). Troglophile.

***Mycetophila ornata* (Stephens, 1832)**

Golemata Mecha dupka (Vr 19) - Beron & Guéorguiev (1967). Trogloxene.

***Tarnania fenestralis* (Meigen, 1818)**

Reznyovete (Vr 16), Ledenika (Vr 17), Golemata Mecha dupka (Vr 19), Malkata Mecha dupka (Vr 27) - Beron & Guéorguiev (1967). Subtroglophile.

***Tarnania dziedzickii* (Edwards, 1924)**

Malkata Mecha dupka (Vr 27) - Beron & Guéorguiev (1967). Subtroglophile.

***Exechiopsis (E.) intersecta* (Meigen, 1818)**

Ledenika (Vr 17) - Beron & Guéorguiev (1967). Subtroglophile.

***Exechiopsis (E.) furcata* (Lundström, 1911)**

Reznyovete (Vr 16) - Beron & Guéorguiev (1967). Subtroglophile.

***Exechiopsis (E.) vizzavonensis* (Edwards, 1928)**

Reznyovete (Vr 16) - Beron & Guéorguiev (1967). Subtroglophile.

***Exechiopsis (E.) indecisa* (Walkenaer, 1856)**

Reznyovete (Vr 16), Malkata Mecha dupka (Vr 27) - Beron & Guéorguiev (1967). Subtroglophile.

Brachycera

Family Stratiomyidae

***Actina nitens* (Latreille, 1809)**

Ledenika (Vr 17) – Beron (1972). Trogloxene.

Family Dolichopodidae

***Liancalus virens* (Scopoli, 1763)**

Temnata dupka (Sf 30), Razhishka peshtera (Sf 32), Peshterata (Sf 10) - Guéorguiev & Beron (1962). Subtroglophile.

Family Phoridae

***Triphleba antricola* (Schmitz, 1918)**

Chavkite (Sf 41), Temnata dupka (Sf 3) – Langourov (2001: 34). Troglophile.

***Triphleba aptina* (Schiner, 1853)**

Ledenika (Vr 17) – Langourov (2001: 35). Troglophile.

***Megaselia fusca* Wood, 1909**

Temnata dupka (Sf 30) - Guéorguiev & Beron (1962). Troglophile-guanophile.

Family Heleomyzidae

***Eccoptomera emarginata* Loew, 1862**

Yavoretskata peshtera (Sf 25), Ledenika (Vr 17), Medenik (Vr 18) - Guéorguiev & Beron (1962); Reznyovete (Vr 16), Golemata Mecha dupka (Vr 19), Malkata Mecha dupka (Vr 27) - Beron & Guéorguiev (1967). Subtroglophile.

***Eccoptomera pallescens* (Meigen, 1830)**

Reznyovete (Vr 16) - Beron & Guéorguiev (1967). Subtroglophile.

***Acantholeria cineraria* (Loew, 1862)**

Zmeyova dupka (Vr 25) – Beron (1972). Trogloxene.

***Scoliocentra* (*Leriola*) *brachypterna* (Loew, 1873)**

Temnata dupka (Sf 30) – Beron (1972). Trogloxene.

***Heleomyza serrata* (Linnaeus, 1758)**

(= *Helomyza s.* = *Leria s.*)

Yavoretskata peshtera (Sf 25), Ledenika (Vr 17) - Guéorguiev & Beron (1962); Reznyovete (Vr 16) - Beron & Guéorguiev (1967). Subtroglophile. One of the most typical members of the parietal association. The larvae live in the guano.

***Heleomyza captiosa* (Gorodkov, 1962)**

Yavoretskata peshtera (Sf 25) – Beron (1972). Subtroglophile.

***Heteromyza atricornis* Meigen, 1830**

(= *Helomyza a.*= *Thelida a.*)

Temnata dupka (Sf 30), Medenik (Vr 18) - Guéorguiev & Beron (1962); Ponora (Vr 22)

- Beron & Guéorguiev (1967); Sini Vir (Sf 84) – Beron (1994). Troglophile-guanophile.

***Heteromyza comixta* Collin, 1901**

(= *Thelida c.*)

Ledenika (Vr 17) - Beron & Guéorguiev (1967). Trogloxene.

Family Sphaeroceridae

***Copromyza* (*Fungobia*) *nitida* (Meigen, 1830)**

(= *Cypsela n.*)

Golemata Vrazha dupka (Sf 35) - Beron & Guéorguiev (1967). Trogloxene.

***Copromyza* (*Crumomyia*) *nigra* (Meigen, 1830)**

(= *Cypsela n.* = *Sphaerocera n.*)

Golemata Vrazha dupka (Sf 35) - Beron & Guéorguiev (1967). Trogloxene.

***Leptocera* sp.**

Zidanka (Sf 29) - Guéorguiev & Beron (1962).

***Terrilimosina racovitzai* (Bezzi, 1911)**

Razhishkata peshtera (Sf 32) – Beron (1972). Trogloxene.

Family Drosophilidae

***Phortica variegata* (Fallén, 1823)**

Studenata dupka (Vr 3) – Beron (1972). Trogloxene.

***Drosophila* (*Sophophora*) *melanogaster* Meigen, 1830**

(= *D. fasciata* Meigen, 1830)

Temnata dupka (Sf 30), Chavkite (Sf 41) – Beron (1994). Trogloxene.

Family Nycteribiidae

***Nycteribia* (*N.*) *schmidli schmidli* Schinner, 1853**

Razhishka dupka (Sf 32) – Hůrka (1962: 161).

***Nycteribia* (*Acrocholidia*) *vexata vexata* Westwood, 1835**

Temnata dupka (Sf 30) - Guéorguiev & Beron (1962).

***Phthiridium biarticulatum* (Hermann, 1804)**

(= *Stylidia biarticulata*)

Temnata dupka (Sf 30) - Guéorguiev & Beron (1962); Razhishka dupka (Sf 32) – Hůrka (1962: 162).

***Penicillidia* (*Penicillidia*) *dufouri* (Westwood, 1835)**

Temnata dupka (Sf 30) - Guéorguiev & Beron (1962); Razhishka peshtera (Sf 32) – Hůrka (1962: 161).

***Penicillidia* (*Neopenicillidia*) *conspicus* Speiser, 1904**

Razhishka peshtera (Sf 32) – Hůrka (1962: 161).

Trichoptera

The order Trichoptera contains in Bulgaria at least 258 species, only 16 of them being recorded from caves and nine from the area under study. As in most European caves three genera (*Stenophylax, Micropterna* and *Mesophylax*) contain the bulk of the regular visitors. They are considered usually as regular trogloxenes.

Family Limnephilidae

***Stenophylax meridiorientalis* Malicky, 1980**

(= *S. speluncarum* = *S. vibex speluncarum* et *S. vibex vibex* sensu auct. bulg.)

Yavoretskata peshtera (Sf 25), Ledenika (Vr 17) – Buresch (1936a: 148);

Reznyovete (Vr 16), Golemata Mecha dupka (Vr 19), Mladenovata peshtera (Vr 30), Garvanets (Vr 31), Zmeyova dupka III (Vr 33) – Botoşaneanu (1965: 58); Srutenata peshtera (Sf 63) - Beron & Guéorguiev (1967); Kitova Kukla (Sf 38) – Kumanski (1971: 210). Regular trogloxene.

***Stenophylax mitis* McLachlan, 1875**

Reznyovete (Vr 16) – Botoşaneanu (1965: 58); Kitova Kukla (Sf 38) – Kumanski (1971: 210). Regular trogloxene.

***Stenophylax permistus* McLachlan, 1895**

Medenik (Vr 18) – Buresch (1936a: 149); Reznyovete (Vr 16), Ledenika (Vr 17), Malkata Mecha dupka (Vr 27), Mladenovata peshtera (Vr 30), Garvanets (Vr 31) – Botoşaneanu (1965: 58). Regular trogloxene..

***Micropterna nycterobia* McLachlan, 1875**

Yavoretskata peshtera (Sf 25), Govedarnika (Sf 64), Srutenata peshtera (Sf 63), Reznyovete (Vr 16), Ledenika (Vr 17), Mladenovata peshtera (Vr 30), Garvanets (Vr 31) - Beron & Guéorguiev (1967); Svardelo (Sf 26), Drankalna dupka (Mt 17). Regular trogloxene.

***Micropterna sequax* McLachlan, 1875**

Ledenika (Vr 17), Garvanets (Vr 31) - Beron & Guéorguiev (1967). Regular trogloxene.

***Micropterna testacea* (Scopoli, 1763)**

Yavoretskata peshtera (Sf 25) - Guéorguiev & Beron (1962). Trogloxene.

***Mesophylax impunctatus aduncus* Navas, 1923**

(sub *M. aspersus* Rambour, 1842)

Mladenovata peshtera (Vr 30) - Beron & Guéorguiev (1967); Dupkata (Vr 46) – Kumanski (1968: 111) – Beron (1972); Malicky (1998: 132). Regular trogloxene.

***Limnephilus lunatus* (Curtis, 1834)**

Mladenovata peshtera (Vr 30) - Beron & Guéorguiev (1967). Trogloxene.

***Grammotaulius nitidus* (Müller, 1764)**

Ledenika (Vr 17) - Beron & Guéorguiev (1967). Trogloxene.

Lepidoptera

The butterflies and moths in Bulgarian caves have been collected intensively during the last years and analysed in the paper of Beshkov & Petrov (1996) in which the recent changes in the nomenclature have been introduced. Altogether 28 species have been recorded, most of them trogloxenic, even chance visitors. Typical element of the parietal fauna are *Triphosa sabaudiata, T. dubitata* and *Scoliopteryx libatrix*. They, and also *Monopis rusticella* and *Alucita cymmatodaclyla*, could be considered subtroglophiles, and some others (*Hypena rostralis*) – regular trogloxenes. The moths most attached to underground environment belong to the families Tineidae, Yponomeutidae, Alucitidae, Geometridae and Noctuidae.

From the area under study are recorded 13 sp. of Lepidoptera.

Family Tineidae

***Tinea* sp.**

Razhishka peshtera (Sf 32) - Guéorguiev & Beron (1962).

Family Yponomeutidae

Ypsolophus wolfschlaegeri (Rebel, 1941)

(= *Cerostoma w.,* in Beron, 1994)

Razhishkata peshtera (Sf 32) – Rebel (1941: 2). Trogloxene.

***Digitivalva granitella* (Treitschke, 1833)**

(= *Acrolepia g.*, in Beron, 1994)

Razhishka peshtera (Sf 32) - Guéorguiev & Beron (1962); Temnata dupka (Sf 30) – Skalski (1971: 215). Regular trogloxene.

***Digitivalva pulicariae* (Klimesch, 1956)**

(= *Acrolepia p.*, in Beron, 1994)

Temnata dupka (Sf 30), Kozarskata peshtera (Sf 34) – Skalski (1971: 216). Trogloxene.

Family Alucitidae (Orneodidae)

***Alucita huebneri* Wallengren, 1859**

Temnata dupka (Sf 30) - Guéorguiev & Beron (1962). Trogloxene.

Family Nymphalidae

***Inachis io* (Linnaeus, 1758)**

Svinskata dupka (Sf 33) – Beshkov & Petrov (1996: 436-437). Trogloxene.

***Triphosa dubitata* (Linnaeus, 1758)**

Ledenika (Vr 17) – Buresch & Tuleshkov (1936: 214); Razhishka peshtera (Sf 32) - Guéorguiev & Beron (1962); Temnata dupka (Sf 30) – Slivov (1968: 177). Subtroglophile.

***Triphosa sabaudiata* (Duponchel, 1830)**

Temnata dupka (Sf 30) – Buresch (1926: 32); Razhishka peshtera (Sf 32) – Buresch & Tuleschkov (1936: 214); Svinskata dupka (Sf 33) – Beshkov & Petrov (1996: 438). Subtroglophile.

Family Noctuidae

***Hypena rostralis* (Linnaeus, 1758)**

Svinskata dupka (Sf 33) – Beshkov & Petrov (1996: 440-441). Regular trogloxene.

***Scoliopteryx libatrix* (Linnaeus, 1758)**

Temnata dupka (Sf 30) – Slivov (1968: 172); Barkite 8 (25 Godini Akademik) (Mt 49) – Dupré (2000: 166). Subtroglophile.

***Autophila dilucida* (Hübner, 1785)**

Temnata dupka (Sf 30) – Buresch & Tuleshkov (1935: 158). Trogloxene.

***Autophila limbata* Staudinger, 1870**

Temnata dupka (Sf 30), Razhishka dupka (Sf 32) – Skalski (1971: 216). Trogloxene.

Family Plutellidae

***Cerostoma wolfschlaegeri* Rebel, 1941**

Razhishka peshtera (Sf 32) – Rebel (1941: 2). Trogloxene.

Origin and Zoogeography of Bulgarian cave fauna, especially what concerns the terrestrial invertebrates of the analyzed area.

The intensive research on the cave and underground living animals in Bulgaria since 1922 accumulated rather complete information on the composition and distribution of most of the groups of underground living animals. Time has come to formulate hypotheses about the origine and the zoogeography of this fauna. Such hypotheses are due mainly to V. Guéorguiev, who analysed the terrestrial troglobites known from Bulgarian caves. His series

of papers (1966 - 1977) was crowned by his monograph on the origine, the formation and the zoogeography of the terrestrial troglobites of Balkan Peninsula (1977). This remarkable book was followed by his speleozoogeographical subdivision of Bulgaria (Guéorguiev, 1992, in Bulgarian). Other attemps to analyze the distribution of the terrestrial cave fauna in Bulgaria find place in the papers of Beron (1976, 1978) and in some articles on different groups of cave animals Deltshev (1978, 1983), Riedel (1975).

In his monograph Guéorguiev (1977) subdivided Balkan Peninsula into four provinces (Dinaric, Egean, of Stara Planina and Rhodopean). Bulgarian territory fells into two of these provinces: the Province of Stara Planina (with two zones – Western and Eastern) and Rhodopean Province (also with two zones – Western and Eastern).

Beron (1976) subdivided the Province of Stara Planina into seven regions, some of them only provisional: Reg. of Eastern Serbia, Reg. of Ogosta, Reg. of Iskar, Reg. of Ossam, Reg. of Russe, Reg. of Kamchiya and Reg. of Dobrudja.

In his monograph Guéorguiev (1977) delimitated also some special regions within his zones and subzones. In Bulgaria these regions (indicated on map) are:

In Western Stara Planina:

Vrachanska Planina (the richest region in troglobites in the eastern part of Balkan Peninsula) – up to 1977 there were 29 terrestrial troglobites in this region, including 17 indicators: *"Cyphoniscellus"* [now *Vandeloniscellus*] *bulgaricus, Bulgarosoma bureschi, Typhloiulus longipes, Centromerus bulgarianus, Neobisium beroni, "Microcreagris bureschi"* [now *Balkanoroncus hadzii*], *Allonychiurus sensitivus, Plusiocampa rauseri* [now synonym of *P. bureschi* and no more indicator], *Pheggomisetes radevi, Ph. r. ilcevi, Ph. r. tranteevi, Ph. globiceps mladenovi, Duvalius beroni, "D. deltschevi"* [now syn. of *Duvalius zivkovi*], *D. papasoffi, D. zivkovi, Radevia hanusi.*

Ponor Planina – 12 troglobites, incl. three indicators: *Eupolybothrus andreevi, Pheggomisetes globiceps globiceps, Ph. g. cerovensis.*

As we can see, meanwhile several changes occured in the taxonomy of these troglobites. Several other species have been added over the 38 years since the edition of the book of Guéorguiev. We have added them as "**new**".

As the monograph of Guéorguiev (1977) concerns data only on terrestrial animals, it seems appropriate to say something on the origin of the remarqable stygobites in Bulgaria (and partly in East Serbia, as it include parts of Stara Planina). Analysis has been made by Pandourski & Breskovski (1995) and I will recall here some of their conclusions. They treat the Isopoda of the families Cirolanidae (marin relics) and Stenasellidae.

It seems that the Albian sea was the last to cover the karstic regions of Western and Central Stara Planina. After its retreat during the entire Upper Cretaceous Western Stara Planina has been emerged land. "Exactly in this time is appropriate to atribute the onquest of the karstic continental freshwater in the emerged massifs by the ancestors of *Sphaeromides bureschi, S. polateni, Protelsonia lakatnicensis* and *P. bureschi*" (we may add here also of *Sphaeromides serbica*, see also Pljalic, 1969). The observations of Pandourski & Breskovski (1995) confirm the "regression model" of Boutin & Coineau, 1990, providing for two fases of penetration of marin forms into the karstic waters of the rocki shore, followed by a sea regression and adaptation of the animals with marin ancestors to life in fresh karstic water.

Endemics in the cave fauna in the area under study.

Terrestrial Mollusca – the most important groups of Gastropoda living in Bulgarian caves belong to the families Zonitidae and Hydrobiidae. The land snails of the family Zonitidae are relatively well known, thanks to the efforts of Prof. Riedel. From ca. 33 sp. found in Bulgaria one third (11 sp.) live in caves. Four of them can be considered endemic. Two slugs seem also endemic: *Litopelte bureschi* (H. Wagner) and *Milax kusceri* H. Wagner. Among the six species of Gastropoda known in the area in study there are no endemic species.

Isopoda Oniscidea - From 24 genera and 49 species (including 26 troglobites) of cave woodlice in Bulgaria, 7 genera (*Balkanoniscus, Rhodopioniscus, Bureschia, Bulgaronethes, Bulgaroniscus, Vandeloniscellus, Tricyphoniscus*, all belonging to Trichoniscidae) and 31 species are endemic for Bulgaria. Zoogeographically and from the point of view of cave evolution the Isopoda terrestria are among the most important and interesting groups in Bulgarian cave fauna. With 32 species in caves (including 24 of all 26 troglobites), Trichoniscidae is the family by far the most important among Bulgarian cave Isopoda. The only other troglobites (*Cordioniscus bulgaricus* Andreev and *C. schmallfussi* Andreev) belongs to the family Styloniscidae and are not known from the area under study. From the 32 species of Trichoniscidae 26 are endemic for Bulgaria.

From Vrachanski Balkan are known 10 species of cave dwelling Isopoda Oniscidea, including four troglobites, all of them from the family Trichoniscidae: *Bureschia bulgarica* Verhoeff, *Tricyphoniscus bureschi* Verhoeff, *Trichoniscus anophthalmus* Vandel and *Vandeloniscellus bulgaricus* (Vandel). All four are Bulgarian endemics, *Vandeloniscellus bulgaricus* and *Bureschia bulgarica* are endemic for the described area, both of them representing endemic genera.

Pseudoscorpiones – Many of the Pseudoscorpions collected in the studied area are not yet identified, there are three endemic species in the caves of Lakatnik – *Neobisium* (*Heoblothrus*) *beroni* Beier and *Balkanoroncus hadzii* Harvey and *Roncus mahnerti* Ćurčić et Beron from Vodnata dupka near Botunya. *Roncus parablothroides* Hadži is Balkanic endemic.

Opiliones – Almost half of the 22 species of harvestmen known to live in Bulgarian caves are known from the studied area. Two species of these 10 are troglobites: *Paralola buresi* Kratochvil, endemic for four caves at Lakatnik Railway Station (remarkable endemic genus and the only cave representative of suborder Laniatores in Bulgaria) and *Paranemastoma* (*Buresiola*) *bureschi* (Roewer) – practically endemic for the studied area (living also in the caves of Odorovsko pole in the Western Confines in Serbia).

Araneae – In the caves of the studied area have been recorded 22 sp. of spiders (out of 99 species of cave spiders in Bulgaria). Only three of them are classified as troglobites in the modern sense: *Protoleptoneta bulgarica* Deltchev, *Centromerus bulgarianus* (Drensky) and *Porrhomma convexum* (Westring). Non of the is endemic for the described area, *Protoleptoneta bulgarica* has been found also in East Serbia.

Diplopoda – From the caves of the studied area are known 17 sp. of Diplopoda, including six troglobites, five of them endemics for this area: *Trachysphaera lakatnicensis* Tabacaru, *Brachydesmus radewi* Verhoeff, *Bacillidesmus bulgaricus bulgaricus* Strasser (and subspecies *B. b. dentatus* Strasser), *Bulgarosoma bureschi* Verhoeff, and *Typhloiulus* (*Inversotyphlus*) *longipes* Strasser. *Typhloiulus* (*Typhloiulus*) *bureschi*

Verhoeff is wider distributed, still remaining Bulgarian endemic. Endemic for this area and its closest confines is the troglophile *Balkanopetalum armatum* Verhoeff – the only representative in Stara Planina of the southbulgarian genus *Balkanopetalum* (Callipodida, Schizopetalidae). Another troglophile (endemic genus and species), described from the area under study, is *Balkanophoenix borisi* Verhoeff.

Typical for the caves of Vrachanska Planina (but found also in caves East of Iskar River, which is not a zoogeographical barriere!) is *Bulgarosoma bureschi.* After the revision of this group (Ćurčić & Makarov, 2000) *B. bureschi* remains the only clear representative of the genus.

Chilopoda – So far 10 sp. of Chilopoda are known from the caves of the studied area, one is Bulgarian endemic (*Lithobius lakatnicensis*).

Diplura – The troglobitic Diplurans from the area under study (*Plusiocampa bulgarica* and *P. bureschi*) are Bulgarian endemics.

Collembola – from 13 sp. of Collembola found in the caves of the studied area there are 4 Bulgarian endemics (mostly local).

Fam. Onychiuridae - *Allonychiurus sensitivus*, *Onychiuroides bureschi, O. subgranulosus*

Fam. Entomobryidae - *Pseudosinella duodecimocellata*

Coleoptera

Carabidae - Three genera in the cave fauna of Bulgaria are Bulgarian endemics, two in Western Stara Planina: *Rambousekiella* and (practically) *Pheggomisetes* and one in the Western Rhodopes – *Paralovricia*. *Pheggomisetes* was found also in caves in East Serbia (the Western Confines of the former Bulgarian territory)(Pretner, 1970; Ćurčić et al., 2004), but the three Bulgarian species remain almost entirely endemics for the studied area. The genus *Duvalius* includes four (3?) troglobitic species in the studied area, all of them local endemics.

Another important group of cave Coleoptera is the family **Leiodidae** with three troglobitic species in the studied area, of two genera, practically endemic for the area: *Beskovia* and *Radevia* (see Giachino & Guéorguiev, 1996, 2008).

Staphylinidae (Pselaphinae) – only one (trogloxenic) species (*Bryaxis beroni*) seems to be Bulgarian endemic (Western Bulgaria).

Siphonaptera – Only subspecies (so far endemic for Bulgaria) of two species of fleas have been described from cave bats in the studied area: *Nycteridopsylla ancyluris johanae* and *N. trigona balcanica*.

Relics in the cave fauna of Bulgaria.

The problem of the relictness and the anciennety of the troglobites still stays. For Jeannel (1944, 1960), followed by Vandel (1964) and Guéorguiev (1977), there was no doubt that the paleotroglobites are very ancient and have no relatives among the recent animals living outside the caves. On the contrary, the neotroglobites still have relatives outside the caves and are connected with them by intermediary forms. For Leleup (1965), the main lines of southeuropean troglobites have their origin in an orophilic prepleistocene fauna, very ancient and very rich, living in biotopes on land emerged in remote geological periods. For Vandel (1964) "Terrestrial troglobites are mostly descendents of a tropical

fauna populating Europe and North America in the first half of the Tertiary". We have to keep in mind that the Paleogene (the first part of the Tertiary) takes the time between 67 and 25 millions years!

In the recent time Brignoli (1979) opposed this assertion, taken longtime as axiomatic. The early deceased prominent Italian specialist writes: "… It is not true at all (or, at least, it is not sure) that the troglobites are ancient". And further:"…The term of "relict" (or even of "living fossil"), so often applied to the troglobites, is for me completely meaningless". However, other prominent specialists do support the opinion of the ancient nature of the troglobites. According to Beier (1969), "…the troglobite species show high degree of specialisation and are without doubt to be considered as relicts from the Tertiary".

The present author also thinks that the assertions of Brignoli are exagerated and that relicts do exist. Which troglobite is ancient and which is more recent is matter of analysis.

In his many papers B. Ćurčić insists that the troglobitic Pseudoscorpions, beetles and Diplopoda of the caves of East Serbia are very old relic, even pre-Tertiary. Our species from Western and Central Stara Planina are very close to them, sometimes even the same subgenera (*Paraduvalius*), so this analysis is equally related to them. For some genera and species, like the members of cave Laniatores (the Bulgarian *Paralola buresi* and the Serbian *Trojanella serbica*) for me there is no doubt that they are Tertiary relicts, despite the opinion of Martens (1972). Some water Isopods of Flabellifera (the two *Sphaeromides* species) are of marine origine and also undoubtfully are relicts (Pandourski & Breskovski, 1995).

Guéorguiev (1977) was firm supporter of the theories of Jeannel and Vandel and his classification of the troglobites according to their origin will be resumed here, completed with some new data.

Descendents of Laurasian phyletic lines

Guéorguiev (1977) considered as Laurasian relicts some spiders of the genus *Nesticus* and some Collembols. Bulgarian *Nesticus* species are also troglophyles.

Descendents of Mesogeidean (paleomediterranean) phyletic lines

As descendents of phyletic line populating in the Paleocene and early Eocene the land streching from Cantabric Mountains to Caucasus and called Mesogeida are considered the Isopods of the endemic genera *Balkanoniscus, Beroniscus* and *Bureschia* (all in Stara Planina and the Predbalkan). Among the Diplopoda such Mesogeidean relicts would be the Glomerid *Trachysphaera lakatnicensis* Tabacaru.

Mesogeidean origin is presumed also for the troglobitic Opilions *Paralola buresi* Kratochvil and *Paranemastoma (Buresiola) bureschi* (Roewer). The endemic genus *Paralola* Kratochvil (Phalangodidae) and its only species *P. buresi* from the caves near Lakatnik in Western Stara Planina represents in Bulgaria the (mostly tropical) suborder Laniatores. Martens (1972) wrote that the Laniatores "should not be considered any more as Tertiary relicts in the European fauna as they are widespread in the areas remaining outside the Pleistocene glaciation". Neverthless, *Paralola* is beyond doubt a relict – its age is to be considered further.

What concerns the *Buresiola*, it is no more considered a separate genus, but a subgenus of *Paranemastoma*. The only known species in Bulgaria is also endemic of Western Stara Planina.

According to Guéorguiev (1977), a third of all endemic troglobite genera of Leiodidae on the Balkan Peninsula are of Mesogeidean origine (such is *Radevia*).

Paleoegeidean (Protoegeidean) relicts

Isopoda – here belongs the Haplophthalminae genus *Tricyphoniscus*, represented in the studied area by the species *Tricyphoniscus bureschi* Verhoeff.

Diplura Campodeidae – may be here belong the troglobitic species of the subgenus *Stygiocampa* (genus *Plusiocampa*), found in Bulgaria in Stara Planina and the Rhodopes.

Nordegeidean relicts

Most terrestrial troglobites of Balkan Peninsula belong to this category, due to the fact that major parts of former Yugoslavia, of Bulgaria and of Greece were situated for long periods during the Tertiary on Northern Egeide.

Many genera of different groups which are listed by Guéorguiev (1977) in the categories of the descendents of Gondwanian phyletic lines, Laurasian phyletic lines, of the descendents of Mesogeidean (paleomediterranean) phyletic lines (*Balkanoniscus, Bureschia, Buresiolla, Paralola*) or the Paleoegeidean (Protoegeidean) relicts (*Tricyphoniscus*) are considered by him also as Nordegeidean relicts. The assertion needs clarification. Further, as Nordegeidean relicts are considered also the following genera: Isopoda (*Hyloniscus*), Diplopoda (*Bulgarosoma, Typhloiulus*). Such are the species of genus *Balkanoroncus* Curčić, not known to Guéorguiev by 1977. They are two species living in the caves of Stara Planina and the Predbalkan: *Balkanoroncus bureschi* (Hadži) and *B. hadzii* Harvey. From the Carabidae here belong the species of genus *Pheggomisetes* Knirsch, from the Leiodidae – the genera *Beskovia, Tranteeviella*, *Balcanobius.*

Southegeidean relicts

In Bulgarian caves most species of genus *Duvalius* belong to subgenera *Biharotrechus* and *Paraduvalius.* According to Jeannel (1928a), the *Paraduvalius* are typical Nordegeidian elements.

Zoogeographical relations of the troglobites and some troglophiles living in the caves of Vrachanski Balkan and Lakatnik

Some of these animals are related to the inhabitants of the caves in the neibouring areas of Western Stara Planina and the adjacent part of the Prebalkan. The spider *Protoleptoneta bulgarica* lives also in Mechata dupka near Lepitsa and in other caves outside Vrachanski Balkan. *Bulgarosoma bureschi* is known only from six caves of Vrachanski Balkan. *Balkanoniscus corniculatus* was published also from caves near Tserovo and Kunino. Also from the big water cave of Tserovo is known another member of Trichoniscidae – *Bureschia bulgarica.* From Drashanskata peshtera is known the thin Diplopod *Bacillidesmus bulgaricus dentatus.* Some local subspecies of *Pheggomisetes* are spread from Iskretz and Gintsi to Karlukovo.

Some other remarkabale troglobites live very close to the described area – such are *Eupolybothrus andreevi* from Tzerovo, *Cyphophthalmus beshkovi* from Deventsi and *Bulgardicus tranteevi* in Karlukovo.

There is a sharp limit, separating the cave fauna of Vrachanski Balkan s.l. and the cave fauna NW from Botunya. Two clearly different complexes of troglobites are found in Vrachanski Balkan s.l. (*Bulgarosoma, Radevia, Beskovia, Paralola*, *Bureschia, Vandeloniscellus bulgaricus, Typhloiulus bureschi, Paranemastoma bureschi*) and in the caves of the districts Montana and Vidin (*Hyloniscus flammula,Trichoniscus bononiensis, Bulgaroniscus gueorguievi***,** *Beronia, Serboiulus, Protoleptoneta beroni,*

Typhloiulus strictus, T. staregai, Onychiuroides beroni). Troglobites, found in Vrachanski Balkan and in the Rhodopes (the same species!)(*Centromerus bulgarianus, Lithobius lakatnicensis, Plusiocampa bulgarica*) are not spread to the NW of Vrachanski Balkan, despite of the proximity of the caves (no caveless space, as is the gap between Stara Planina and the Rhodopes).

Interesting feature in the distribution of some troglophiles is the presence of the Diplopod *Balkanopetalum armatum*, the only representative of the genus in Stara Planina (the other species have been described from Southern Bulgaria). Even more interesting is the lack of cave Orthoptera in Vrachanski Balkan and the caves of Iskar Valley. Cave *Troglophilus* live near the border with Serbia, but their distribution is stopped abruptly in the area of Vrachanski Balkan, despite the availability of many caves there with conditions similar of the conditions in the caves more to the west.

Caves of the described area and lists of their terrestrial invertebrates

(the numbers of the caves follow the system of Guéorguiev & Beron, 1962 and Beron, 1994)

Montana – Mt (= Mg)

Mt 17. Drankalna dupka - pot hole near Dolno Ozirovo Village. Length 78 m. Denivellation: - 89 m. Coordinates: N 43° 15' 01,2" E 23° 21' 34,4". Visit: 14.06.1969 (P. Beron, V. Beshkov).
Araneae: ***Porrhomma convexum***
Trichoptera: *Micropterna nycterobia*
Mt 18. Grebenyo - cave-pot hole near Dolno Ozirovo Village. Visit: 16.06.1970 (P. Beron, V. Beshkov).
Araneae: ***Protoleptoneta bulgarica***
Chilopoda: ***Lithobius lakatnicensis***
Coleoptera, Carabidae: ***Rambousekiella ledenicensis***
Mt 19. Nikolova yama - pot hole near Dolno Ozirovo Village. Length 107 m, deniv. - 22 m.
Araneae: *Nesticus cellulanus*
Diplopoda: ***Typhloiulus bureschi***
Mt 20. Vodnata dupka - cave near Dolno Ozirovo Village.
Lepidoptera: *Scoliopteryx libatrix*
Mt 49. Barkite 8 (25 Godini Akademik) – pot hole near Gorno Ozirovo Village. Alt. 830 m. Length 733 m. Denivellation: - 190 m. Coordinates: N 43° 13' 18,7" E 23° 27' 24,6". Visits: 26.07.1997 (B. Petrov), 31.10.2004 (P. Beron).
Pseudoscorpiones: *Roncus* sp.
Opiliones: *Paranemastoma* sp.
Araneae: ***Centromerus bulgarianus***
Coleoptera, Carabidae: ***Pheggomisetes globiceps mladenovi, Ph. buresi, Duvalius zivkovi***
Coleoptera, Leiodidae: ***Radevia hanusi***
Lepidoptera: *Scoliopteryx libatrix*
Mt 51. Vartop – cave near Dolna Bela rechka.
Scorpiones: *Euscorpius deltshevi*

Sofia - Sf

Sf 25. Yavoretskata peshtera - cave near Lakatnik Village. Length 211 m. Visits: 17.02.1962 (A. Grozdanov, P. Beron).
Pseudoscorpiones: *Roncus lubricus*
Opiliones: ***Paranemastoma bureschi***
Araneae: *Lepthyphantes leprosus, L. centromeroides, Meta menardi*
Collembola: *Pseudosinella duodecimocellata, Heteromurus nitidus quadriocellatus*
Diplura: *Campodea frenata,* ***Plusiocampa bulgarica***
Diptera: *Eccoptomera emarginata, Heleomyza [Leria] serrata, H. captiosa*
Trichoptera: *Micropterna testacea, M. nycterobia, Stenophylax meridiorientalis*
Sf 26. Svardelo - pot hole near Lakatnik Railway Station. Denivelation: -22 m. Visit: 2.07.1960 (P. Beron).
Opiliones: *Paranemastoma radewi,* ***P. bureschi***
Diplopoda: ***Trachysphaera lakatnicensis***
Trichoptera: *Micropterna nycterobia*
Sf 27. Peshtereto - cave near Lakatnik Railway Station. Length 200 m. Deniv. 7 m. Visit: 19.04.1992 (D. Kozhuharov).
Opiliones: *Paranemastoma radewi*
Diplopoda: *Balkanopetalum armatum*
Sf 29. Zidanka - cave near Lakatnik Railway Station, connected with Sf 30. Length ca. 400 m. Many visits by all Bulgarian Biospeologists.
Isopoda: *Trichoniscus bureschi*
Opiliones: *Paranemastoma radewi,* ***P. bureschi, Paralola buresi***
Araneae: ***Centromerus bulgarianus***
Chilopoda: *Eupolybothrus transsylvanicus,* ***Lithobius lakatnicensis***
Diplopoda: ***Trachysphaera lakatnicensis, Typhloiulus bureschi***
Collembola: *Heteromurus nitidus*
Coleoptera, Carabidae: ***Pheggomisetes globiceps lakatnicensis, Duvalius papasoffi***
Coleoptera, Staphylinidae: *Atheta macroptera dinarica, Quedius mesomelinus skoraszewskyi*
Diptera: *Leptocera* sp.
Sf 30. Temnata dupka - cave near Lakatnik Railway Station. Alt. 600 m. Length > 7000 m. Denivelation: +33/ -21 m. Coordinates: N 43° 05' 19,9" E 23° 23' 10,6" * N 43° 05' 22,9" E 23° 23' 28,3". Big river. Bulgaria's richest in cave fauna. Visits: many, by most Bulgarian Biospeologists.
Protozoa: *Tokophria* sp., *Vorticella* sp.
Oligochaeta: *Octolasium lacteum*
Gastropoda: *Oxychilus glaber*
Isopoda, Oniscidea: *Trichoniscus bureschi,* ***Bureschia bulgarica***
Scorpiones: *Euscorpius* sp.
Opiliones: *Paranemastoma radewi,* ***P. bureschi, Paralola buresi***
Araneae: ***Porrhomma convexum,*** *Lepthyphantes leprosus, Nesticus* sp., *Pholcus opilionides, Ph. phalangioides, Tegenaria domestica*
Acari: *Spinturnix plecotina, Ichoronyssus scutatus, Macronyssus cyclaspis, Steatonyssus periblepharus, Argas vespertilionis, Ixodes vespertilionis, Leptotrombidium russicum, Chiroptella muscae, Pentagonaspis trajani, Chiroptoglyphus bulgaricus*
Chilopoda: ***Lithobius lakatnicensis****, Henia illyrica*

Diplopoda: *Glomeris pustulata,* ***Typhloiulus bureschi***
Collembola: *Deuteraphorura ghidinii, Heteromurus nitidus,* ***Pseudosinella duodecimocellata****, Orchesella villosa* var. *devergens*
Diplura: ***Plusiocampa bureschi***
Coleoptera, Carabidae: ***Pheggomisetes globiceps lakatnicensis, Duvalius papasoffi***
Coleoptera, Staphylinidae: *Atheta graminicola, A. spelaea, Quedius mesomelinus skoraszewskyi*
Coleoptera, Cryptophagidae: *Micrambe translatus*, *Cryptophagus scutellatus*
Diptera: *Triphleba antricola, Scoliocentra brachypterna, Drosophila fasciata, Heteromyza atricornis, Liancalus virens, Megaselia fusca, Phthiridium [Stylidia] biarticulatum, Nycteribia vexata, Penicillidia dufouri*
Siphonaptera: *Nycteridopsylla trigona balcanica, N. eusarca, Ischnopsyllus octactenus, Rhinolophopsylla unipectinata unipectinata*
Lepidoptera: *Allucita hubneri, Digitivalva granitella, D. pulicariae, Autophila dilucida, A. limbata, Triphosa sabaudiata, T. dubitata, Scoliopteryx libatrix*

Sf 32. Razhishka peshtera (dupka) - cave near Lakatnik Railway Station, 140 m above Iskar River. Length 316 m. Denivelation: +22 m. Coordinates: N 43° 05' 24,2" E 23° 23' 10,4". Visits: many, since 1955 (P. Beron, V. Beshkov), 22.02.1995 and others (B. Petrov).
Scorpiones: *Euscorpius* sp.
Pseudoscorpiones: ***Balkanoroncus hadzii***
Araneae: ***Centromerus bulgarianus****, C. lakatnicensis, Echemus rhenanus, Lepthyphantes leprosus, Microneta viaria,* ***Porrhomma convexum****, Tegenaria domestica*
Acari: *Chiroptoglyphus bulgaricus Leptotrombidium russicum, Willmannium bulgaricum, Oudemansidium komareki, Steatonyssus periblepharus, Macronyssus cyclaspis, M. uncinatus, Paraperiglischrus rhinolophinus, Spinturnix emarginata, S. plecotina, Argas vespertilionis, Ixodes vespertilionis, I. simplex*
Diplopoda: ***Typhloiulus bureschi****, Balkanophoenix borisi*
Collembola: ***Pseudosinella duodecimocellata***
Diplura: ***Plusiocampa bureschi*** (= *P. rauseri*)
Hymenoptera: *Diphyus quadripunctorius* (sub *Amblyteles bipunctatus*)
Diptera: *Limonia nubeculosa, Nycteribia schmidli, Phthiridium [Stylidia] biarticulatum, Penicillidia conspicua, P. dufouri, Terrilimosina racovitzai*
Siphonaptera: *Nycteridopsylla trigona balcanica, N. ancyluris johanae, Ischnopsyllus octactenus, Rhinolophopsylla unipectinata unipectinata*
Lepidoptera: *Digitivalva granitella, Autophila limbata, Ypsolophus wolfschlaegeri, Tinea* sp.*, Triphosa dubitata, T. sabaudiata*

Sf 33. Svinskata dupka - cave near Lakatnik Railway Station. Length 362 m, deniv. + 15 m. Coordinates: N 43° 05' 17,02" E 23° 22' 10,64". Visits: many, since 1955 (P. Beron, V. Beshkov), 26.09.1992 (P. Stoev); 27.11.1994, 22.02.1995, 11.12.2002 (B. Petrov).
Nematoda: *Fictor fictor*, *Cephalobius persegnis*, *Eucephalobius mucronatus*, *Acrobeloides* sp., *Chiloplacus* sp., *Helicotylenchus vulgaris*, *Plectus* sp. (I. Iliev det.)
Pseudoscorpiones: ***Neobisium beroni***
Opiliones: ***Paralola buresi***
Araneae: *Antrohyphantes sophianus, Meta menardi*
Acari: *Eyndhovenia euryalis, Paraperiglischrus rhinolophinus*
Chilopoda: ***Lithobius lakatnicensis***

Diplopoda: ***Trachysphaera lakatnicensis***, ***Typhloiulus bureschi***
Collembola: *Onychiuroides postumicus*
Coleoptera, Carabidae: ***Pheggomisetes globiceps lakatnicensis***
Coleoptera, Staphylinidae: *Quedius mesomelinus*
Lepidoptera: *Inachis io, Hypena rostralis, Triphosa sabaudiata*

Sf 34. Kozarskata peshtera - cave near Lakatnik Railway Station. Alt. 395 m. Length 834 m. Denivelation: +12 m. Visits: many, since 1956 (P. Beron), 21.03.1993 (P. Stoev), 01.01.2004 (P. Beron & V. Beshkov).
Opiliones: ***Paralola buresi***
Pseudoscorpiones: ***Neobisium beroni***
Diplopoda: ***Trachysphaera lakatnicensis***
Diplura: ***Plusiocampa bureschi***
Coleoptera, Leiodidae: ***Beskovia beroni***
Lepidoptera: *Digitivalva pulicariae*

Sf 35. Golemata Vrazha dupka - cave near Lakatnik Railway Station. Visit: 1.01.1958 (P. Beron).
Isopoda: *Trichoniscus bureschi*
Araneae *Liocranum rupicola*
Diptera: *Cypsela nitida, C. nigra*

Sf 36. Sedmovratitsa - cave near Lakatnik Railway Station. Visits: 16.11.1957, 5.11.1961 (P. Beron).
Isopoda: *Armadillidium klugi*
Araneae: *Lepthyphantes leprosus*
Diplopoda: *Glomeris pustulata,* ***Trachysphaera lakatnicensis***
Diplura: ***Plusiocampa bureschi***

Sf 38. Kitova Kukla - cave near Druzhevo Village. Lenght 124 m, deniv. 5 m. Visit: 7.08.1961 (P. Beron).
Opiliones: ***Paranemastoma bureschi***
Araneae: *Meta menardi*
Diplopoda: ***Bulgarosoma bureschi***
Trichoptera: *Stenophylax mitis, S. meridiorientalis*, *Micropterna nycterobia*

Sf 40. Yamata - cave near Lakatnik Railway Station.
Gastropoda: *Oxychilus glaber striarius*
Araneae: ***Porrhomma convexum****, Walckenaeria capito*
Diplopoda: *Pachyiulus cattarensis*
Coleoptera, Carabidae: ***Pheggomisetes globiceps georgievi***

Sf 41. Chavkite - pot hole above Milanovo Village, area of summit Sokolets. Length 50 m. Denivelation: - 70 m. Visit: 23.11.1958 (P. Beron).
Collembola: *Ceratophysella armata, Bonetogastrura cavicola*
Coleoptera, Carabidae: ***Pheggomisetes buresi***
Diptera: *Triphleba antricola, Drosophila fasciata*

Sf 44. Suhata yama – cave - pot hole near Druzhevo Village. Denivelation: 20 m. Visits: (P. Beron & V. Beshkov).
Araneae: *Meta menardi, Antrohyphantes sofianus*
Coleoptera, Carabidae: ***Pheggomisetes radevi tranteevi***

Sf 49. Pyasachnata dupka - cave near Lakatnik Railway Station.

Diplura: ***Plusiocampa bureschi***
Coleoptera, Carabidae: ***Duvalius papasoffi***
Sf 55. Razhishka yama - pot hole near Milanovo Village. Denivelation: 22 m.
Diplopoda: ***Typhloiulus bureschi***
Collembola: *Tomocerus vulgaris*
Sf 59. Radyova propast – pot hole near Milanovo Village. Denivelation: 52 m. Visit: 3.12.1961 (P. Beron)
Opiliones: ***Paranemastoma bureschi***
Araneae: *Centromerus lakatnikensis, Antrohyphantes sofianus, Metellina merianae*
Coleoptera, Carabidae: ***Pheggomisetes buresi, Ph. globiceps lakatnicensis***
Coleoptera, Leiodidae: ***Radevia hanusi***
Sf 72. Zdraveshka dupka - cave near Druzhevo Village. Length 84 m. Denivelation: -23 m. Visit: 7.08.1961 (P. Beron).
Araneae: *Meta menardi, Antrohyphantes sofianus, Nesticus cellulanus*

Vratsa - Vr

Vr 3. Studenata dupka (Cherepishkata) – cave near Cherepish Railway Station. Length 634 m. Denivellation: 43 m (-16 +27). Visits: 05.06.1960 (P. Beron, V. Beshkov) and others.
Gastropoda: *Oxychilus glaber striarius*
Isopoda: ***Trichoniscus anophthalmus***
Diplopoda: *Balkanopetalum armatum*
Chilopoda: *Eupolybothrus transsylvanicus*
Araneae: *Hoplopholcus forskali, Metellina merianae, Nesticus cellulanus, Tegenaria domestica, T. silvestris*
Coleoptera, Leiodidae: ***Beskovia bulgarica****, Choleva agilis*
Diptera: *Phortica variegata*
Vr 4. Ezeroto - cave near Cherepish Railway Station. Visit: 5.06.1960 (V. Beshkov).
Isopoda: ***Trichoniscus anophthalmus***
Coleoptera, Leiodidae: *Choleva agilis*
Vr 5. Serapionovata peshtera – cave near Cherepish Railway Station. Length 129 m. Denivellation: ca -32 m. Abundant bat guano. Visits: 06.07.1960 (P. Beron), 31.01.1991, 22.02.1991, 24.02.1991 (P. Stoev); 03.03.1991 (P. Stoev, B. Petrov & R. Pandurska); 07.03.1992 (P. Stoev); 15.04.1993 (P. Stoev, T. Ivanova & B. Barov); 07.11.1993 (P. Stoev); 03.03.1996 (B. Petrov & B. Barov).
Araneae: *Lepthyphantes leprosus, Tegenaria domestica, Steatoda triangulosa, Liocranum rupicola, Haplopholcus forskali*
Pseudoscorpiones: *Chernes hahni*
Diplopoda: *Brachydesmus* sp., *Balkanopetalum armatum*
Chilopoda: *Lithobius* aff. *schuleri*
Coleoptera, Staphylinidae: *Quedius mesomelinus skoraszewskyi, Atheta macroptera*
Coleoptera, Leiodidae: ***Beskovia bulgarica***
Vr 7. Nevestina propast – pot hole near Vratsa. Denivellation: -76 m. Visit: (P. Beron).
Diplopoda: ***Bulgarosoma bureschi***
Coleoptera, Carabidae: ***Pheggomisetes globiceps stoicevi***
Vr 16. Reznyovete - pot hole near Vratsa. Denivelation: -32 m. Visit: 23.08.1963 (P. Beron).

Opiliones: *Leiobunum rumelicum,* ***Paranemastoma bureschi****, P. radewi*
Araneae: *Meta menardi*
Chilopoda: *Lithobius agilis, L. viriatus, Harpolithobius anodus*
Diplopoda: ***Bulgarosoma bureschi***
Collembola: *Ceratophysella armata*
Coleoptera, Carabidae: ***Pheggomisetes buresi***
Coleoptera, Staphylinidae: *Quedius mesomelinus skoraszewskyi*
Trichoptera: *Micropterna nycterobia, Stenophylax mitis, S. permistus, S. mediorientalis*
Diptera: *Limonia nubeculosa, Tarnania fenestralis, Exechiopsis furcata, E. indecisa, E. vizzavonensis, Eccoptomera emarginata, E. pallescens, Heleomyza serrata*

Vr 17. Ledenika – show cave near Vratsa. Alt. 830 m. Length 226 m. Coordinates: N 43°12'35,6" E 23°29'34,8". The systematic exploration of the Bulgarian cave fauna began in 1922 with this cave. Recent visits: many (P. Beron), 22.05.1994 (P. Stoev & B. Petrov); 18.03.1995 (P. Stoev, T. Ivanova & B. Guéorguiev).
Oligochaeta: *Allolobophora biserialis*
Gastropoda: *Daudebardia* sp., *Oxychilus glaber striarius, Vitrea diaphana*
Isopoda: *Porcellium balkanicum, Hyloniscus riparius, Protracheoniscus ubliensis, Trichoniscus bureschi,* ***Tricyphoniscus bureschi***
Opiliones: ***Paranemastoma bureschi****, Leiobunum rumelicum*
Araneae: *Coelotes jurinitschi, Lepthyphantes leprosus, L. sofianus,* ***Porrhomma convexum****, Araneus diadematus, Ceratinopsis romana, Nesticus cellulanus, Meta menardi, Tegenaria silvestris*
Diplopoda: *Polydesmus renschi, Strongylosoma stigmatosum,* ***Bulgarosoma bureschi***
Chilopoda: *Strigamia crassipes*
Collembola: *Bonetogastrura cavicola, Onychiuroides bureschi,* ***Allonychiurus sensitivus, Pseudosinella duodecimocellata****, Heteromurus nitidus*
Thysanura: *Trigoniophthalmus banaticus*
Coleoptera, Carabidae: ***Duvalius zivkovi***, ***Pheggomisetes buresi***, ***Ph. radevi***, ***Rambousekiella ledenikensis***
Coleoptera, Leiodidae: ***Radevia hanusi****, Catops picipes*
Coleoptera, Staphylinidae: *Quedius mesomelinus skoraszewskyi*
Diptera: *Triphleba aptina, Eccoptomera emarginata, Heleomyza serrata, Limonia nubeculosa, Tarnania fenestralis, Exechiopsis intersecta, Heteromyza comixta, Actina nitens*
Trichoptera: *Stenophylax mediorientalis, S. permistus, Grammotaulius nitidus, Micropterna nycterobia*
Lepidoptera: *Triphosa dubitata*

Vr 18. Medenik – pot hole cave and ancient mine 9 km north of Eliseyna Railway Station. Visit: 13.07.1924 (I. Buresch & N. Radev).
Oligochaeta: *Allolobophora biserialis, Fridericia* sp., *Henlea subterranea*
Gastropoda: *Agriolimax bureschi*
Isopoda: *Trachelipus balticus*
Opiliones: ***Paranemastoma bureschi,*** *Lacinius gallipoliensis, Phalangium opilio, Zacheus crista*
Chilopoda: *Cryptops anomalans*
Diplopoda: ***Typhloiulus* aff. *bureschi***
Collembola: *Bonetogastrura cavicola*

Coleoptera, Carabidae: ***Pheggomisetes buresi medenikensis, Ph. radevi***
Diptera: *Eccoptomera emarginata, Heteromyza atricornis*
Trichoptera: *Stenophylax permistus*
Vr 19. Golemata Mecha dupka - cave near Vratsa. Length 83 m, deniv. – 14 m. Visit: 19.08.1963 (P. Beron).
Opiliones: ***Paranemastoma bureschi***
Coleoptera, Carabidae: ***Pheggomisetes buresi, Ph. globiceps lakatnicensis***
Coleoptera, Leiodidae: ***Radevia hanusi***
Diptera: *Limonia nubeculosa, Tarnania fenestralis, Mycetophila ornata, Eccoptomera emarginata*
Trichoptera: *Stenophylax meridiorientalis*
Vr 23. Golemata yama - cave near Chelopek Village. Denivelation: 51 m.
Opiliones: *Egaenus convexus, Trogulus tricarinatus, Zacheus crista*
Araneae**: *Porrhomma convexum***
Coleoptera, Carabidae: ***Pheggomisetes* sp.**
Coleoptera, Staphylinidae: *Quedius mesomelinus skoraszewskyi*
Coleoptera, Leiodidae: *Catops coracinus*
Vr 24. Malata yama – pot hole near Chelopek Village. Denivelation: 18 m.
Opiliones: *Paranemastoma radewi*
Coleoptera, Carabidae: ***Pheggomisetes* sp.**
Vr 25. Zmeyova dupka I - pot hole near Bistrets Village. Length 122 m. Denivelation: - 68 m. Coordinates: N 43° 14' 08,5" E 23° 27'41". Visit: 29.10.1960 (P. Beron).
Opiliones: ***Paranemastoma bureschi***
Araneae: *Meta menardi*
Collembola: *Heteromurus nitidus*
Coleoptera, Carabidae: ***Pheggomisetes buresi***
Coleoptera, Leiodidae: ***Radevia hanusi***
Diptera: *Acantholeria cineraria*
Vr 27. Malkata Mecha dupka - cave near Vratsa. Length ca. 20 m. Visit: 24.10.1968 (P. Beron).
Opiliones: ***Paranemastoma bureschi***
Diplopoda: ***Bulgarosoma bureschi***
Coleoptera, Carabidae: ***Pheggomisetes buresi, Ph. globiceps mladenovi, Duvalius zivkovi***
Diptera: *Limonia nubeculosa, Tarnania fenestralis, Exechiopsis indecisa, Eccoptomera emarginata*
Trichoptera: *Stenophylax permistus*
Vr 29. Sipo (Sipo 1) - pot hole near Bistrets Village. Denivelation: - 80 m. Visit: (P. Beron).
Araneae: *Antrohyphantes sofianus*
Diplopoda: ***Typhloiulus bureschi***
Vr 31. Garvanets - pot hole near Bistrets Village. Length 43 m. Deniv. – 19 m. Visit: 19.08.1963 (P. Beron).
Opiliones: ***Paranemastoma bureschi***
Araneae: ***Porrhomma convexum***
Coleoptera, Pselaphinae: *Bryaxis beroni*
Trichoptera: *Micropterna sequax, M. nycterobia, Stenophylax meridiorientalis, S. permistus*

Vr 32. Zmeyova dupka II - pot hole near Bistrets Village. Denivelation: 50 m.
Araneae: *Antrohyphantes sofianus*
Coleoptera, Carabidae: ***Pheggomisetes buresi***
Vr 33. Zmeyova dupka III - pot hole near Bistrets Village. Denivelation: 35 m. Visit: 20.08.1963 (P. Beron).
Opiliones: *Pyza bosnica*, *Trogulus tricarinatus*
Coleoptera, Leiodidae: ***Radevia hanusi***
Trichoptera: *Stenophylax meridiorientalis*
Vr 35. Ledenishka Yama – cave-pot hole near Ledenika Hut. Denivelation: 38 m. Visit: 20.11.1988 (R. Pandurska).
Gastropoda: *Oxychilus depressus*
Opiliones: ***Paranemastoma bureschi***
Coleoptera, Carabidae: ***Pheggomisetes buresi***
Vr 36. Pesopin kamak - cave near Vratsa. Length 910 m, deniv. – 8 + 6 m.
Coleoptera, Carabidae: ***Pheggomisetes buresi***
Vr 40. Kalnata dupka – pot hole near Vratsa. Denivelation: 87 m. Visit: 24.09.1968 (P. Beron).
Collembola: *Ceratophysella armata*
Coleoptera, Carabidae: ***Pheggomisetes buresi***
Coleoptera, Staphylinidae: *Quedius mesomelinus skoraszewskyi*
Coleoptera, Leiodidae: *Choleva agilis*
Vr 41. Duglaska – cave near Ledenika Hut, explored length ca. 350 m, small stream. Visit: 2.05.2010 (P. Beron).
Araneae: under study
Coleoptera: ***Pheggomisetes buresi***
Vr 42. Toshova dupka (Kalna Matnitsa) - cave near Glavatsi Village. Length 1302 m. Denivelation: -63 m. Coordinates: N 43° 14' 33,2" E 25° 02' 09,2". Visits: 17.02.1968 (P. Beron), 12.06.1994 (T. Ivanova); 03.04.1999 (B. Petrov).
Isopoda Oniscidea: ***Vandeloniscellus bulgaricus***, ***Trichoniscus anophthalmus***
Opiliones: *Paranemastoma radewi*
Araneae: ***Porrhomma convexum***, *Hoplopholcus forskali, Meta menardi, Metellina merianae, Nesticus cellulanus*
Pseudoscorpiones: *Chthonius* sp.
Chilopoda: ***Lithobius lakatnicensis***
Diplopoda: *Trachysphaera* sp., ***Typhloiulus bureschi***
Collembola: *Ceratophysella armata*
Coleoptera, Carabidae: ***Duvalius beroni***
Coleoptera, Pselaphinae: *Bryaxis beroni*
Coleoptera, Endomychidae: *Mycetaea hirta*
Coleoptera, Staphylinidae: *Atheta macroptera, Quedius mesomelinus skoraszewskyi*
Vr 43. Malkata Nevestina propast – pot hole near Vratsa. Denivelation: 15 m.
Coleoptera, Carabidae: ***Pheggomisetes buresi***, ***Duvalius zivkovi***
Vr 45. Mecha dupka (Chernata Mecha dupka) - cave near Lyutadjik Village. Visit: 5.02.1967 (P. Beron).
Araneae: *Metellina merianae*
Vr 47. Lednitsata – pot hole near Vratsa. Denivelation: -52 m.

Collembola: *Onychiuroides subgranulosus,* ***Pseudosinella duodecimocellata***
Vr 52. Sokolskata dupka - cave near Lyutadjik Village. Underground stream. Length 815 m. Denivelation: +44 m. Alt. 800 m. Visit: 5.02.1967 (P. Beron).
Opiliones: ***Paranemastoma bureschi***
Araneae: ***Centromerus bulgarianus****, Tegenaria silvestris, Meta menardi*
Vr 53. Belyar – pot hole - cave near Vratsa. Length 2560 m. Denivelation: -282 m. Visits: 7.10.1968 (P. Beron), 7.11. 1970 (V. Beshkov), 27.07.1997 (B. Petrov).
Isopoda: ***Bureschia bulgarica***
Araneae: ***Centromerus bulgarianus***
Opiliones: ***Paranemastoma bureschi***
Diplopoda: ***Bulgarosoma bureschi, Typhloiulus longipes***
Coleoptera, Carabidae: ***Pheggomisetes* sp.**
Vr 55. Barkite 14 - cave near Vratsa. Alt. 834 m. Length 2600 m. Denivelation: 356 m. Coordinates: N 43° 13' 15" E 23° 27' 29,7". Visit: (P. Beron).
Araneae: *Nesticus cellulanus, Antrohyphantes sofianus*
Vr 64. Shishmanovets – cave near Cherepish Railway Station.
Diplopoda: *Balkanopetalum armatum*
Vr 65. Vratnik – cave near Lyutadjik Village.
Araneae: *Meta menardi, Metellina merianae, Tegenaria silvestris*
Vr 72. Princhovitsa – cave near Moravitsa Village. Length 227 m. Visit: 19.10.1973 (P. Beron).
Araneae: *Lepthyphantes leprosus, Tegenaria domestica*
Coleoptera, Carabidae: *Trechus quadristriatus*
Coleoptera, Staphylinidae: *Atheta macroptera*
Vr 74. Vodna (Vodnata dupka) - cave near Botunya Village. Length 130 m. Visit: 13.06.1971 (P. Beron).
Pseudoscorpiones: ***Roncus mahnerti***
Araneae: ***Porrhomma convexum***
Vr 75. Sveti Kirik - cave near Botunya Village.
Araneae: *Tegenaria domestica*
Vr 83. Haydushka dupka – pot hole near Bistrets Village. Denivelation 108 m. Visit: 26.04.1970 (P. Beron)
Opiliones: ***Paranemastoma bureschi***
Vr 84. Barkite 9 – pot hole near Vratsa.
Coleoptera, Leiodidae: ***Radevia hanusi***
Vr 86. Bezimenna
Coleoptera, Leiodidae: ***Radevia hanusi***
Vr 89. Chetvartitata dupka – cave at the foot of Kobileni steni, Opletnya Village. Alt. 1430 m. Length ca. 50-60 m. Humide, bat guano. Visit: 22.05.1994 (P. Stoev & B. Petrov).
Diplopoda: *Trachysphaera* sp.
Vr 91. Cherniya Izvor – cave near Matnishki Monastery. Underground source. Length 546 m. Denivelation: +35 m. Visit: 03.04.1999 (B. Petrov).
Scorpiones: *Euscorpius deltshevi*
Chilopoda: *Lithobius* cf. *micropodus*
Coleoptera, Staphylinidae: *Quedius* sp., *Atheta* sp.
Vr 92. Malkata peshtera – cave in Vrachanski Balkan Mt. above Zgorigrad Village. Visit:

16.05.1999 (B. Petrov).
Pseudoscorpiones: *Chernes hahnii*
Diplopoda: *Strongylosoma stigmatosum*

Vr 93. Labirinta – cave near Cherepish Railway Station. Visits: 07.03.1992, 07.11.1993 (P. Stoev).
Diplopoda: ***Typhloiulus* sp.**

Vr 97. Mizheshnitsa – cave near Ledenika Hut. Streams, explored length ca. 1800 m, explored denivelation ca. 150 m. Visit: 1.05.2010 (P. Beron).
Collembola: under study
Coleoptera, Carabidae: ***Pheggomisetes buresi***

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Сухоземните пещерни безгръбначни във Врачанска планина

ПЕТЪР БЕРОН

(Резюме)

В настоящия обзор са включени 65 пещери, от които са известни 218 сухоземни безгръбначни, в района на Природния парк «Врачански Балкан», вкл. пещерите при Лакатник. От тях са съобщени 218 вида, от които 32 се смятат за троглобионти (Isopoda Oniscidea – 4, Chilopoda – 1, Diplopoda – 5, Opiliones – 2, Pseudoscorpiones – 3, Araneae – 3, Collembola - 2, Diplura – 2, Coleoptera Carabidae – 7, Col. Leiodidae - 3). Най-богати на троглобионти са пещерите при гара Лакатник (Темната дупка - 10, Зиданка – 7, Ражишката дупка - 6, Свинската дупка – 6, Козарската пещера - 5), при Враца (Леденика - 11, Барките 8 – 5, Беляр - 6), Тошова дупка при Главаци – 6 и др. Троглобионти са познати от 51 пещери в описвания район. Направен е анализ на произхода и зоогеографските особености на сухоземните безгръбначни в описвания район. Литературата върху тези животни възлиза на 120 заглавия.

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The Herpetofauna (Amphibia and Reptilia) of Vrachanska Planina Mountains - Species Composition, Distribution and Conservation

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Abstract. Vrachanska Planina Mts. is located in northwestern Bulgaria and is a relatively well-defined part of Stara Planina Mts. So far, no comprehensive studies on the species composition and distribution of the herpetofauna of Vrachanska Planina Mts. have been published. The current study reports 8 new species of amphibians and reptiles, which are new for the region and confirms all previously known 19 species. All species localities have been mapped in the UTM-grid (1×1 km). The spatial distribution, as well as the vertical distribution and the species richness are analyzed. The importance of the existing protected areas in Vrachanska Planina Mts. and protected Natura2000 zones for the conservation of herpetofauna are discussed. Some potential threats to amphibians and reptiles in the research area (such as drying-up of water basins, fires and road mortality) are reported.

Key words: Amphibia, Reptilia, distribution, conservation, Bulgaria, Vratsa.

Introduction

Over the past 15 years a number of scientific publications, dealing with the herpetofauna of particular geographic regions in Bulgaria have been published (e.g. Sakar Mts. - Stoev 2000, Rusenski Lom Region - Undjian 2000, Kresna Gorge - Petrov & Beshkov 2001, Eastern Rhodopes Mts. - Petrov 2004, Western Rhodopes Mts. - Petrov *et al.* 2006, Blagoevgrad Region - Pulev & Sakelarieva 2009, 2011a, b, Besaparski Ridove Heights - Popgeorgiev *et al.* 2010; Ponor Mts. - Popgeorgiev *et al.* 2014, Northern Black Sea Coast - Tzankov *et al.* 2009; Rilska Tiver Basin - Tzankov *et al.* 2011; Vitosha Mts. - Tzankov *et al.* 2014, Sinite Kamani Nature Park - Deleva *et al.* 2014), and in the book of Stojanov *et al.* (2011) were presented up-to-date maps of the distribution of the amphibians and reptiles at the national level. However, regional distribution and species composition of the Bulgarian herpetofauna cannot be considered to have been fully explored.

Almost all amphibian and reptile species, occurring in the country are legally protected under the Bulgarian and EU laws. A significant role in the species' protection play especially the protected areas and national and nature parks, because of their relatively large area. Although the parks in Bulgaria have developed management plans, the scientific publications on their herpetofauna are scarce. Of particular interest in this regard is the work of Tzankov *et al.* (2014), analyzing in detail the distribution and habitats of the amphibians and reptiles in the Vitosha Mts., much of which falls within the Nature Park "Vitosha"'s territory.

The herpetofauna of Vrachanska Planina Mts. was studied in relation with the preparation of the management plan for Nature Park "Vrachanski Balkan" in 2006, but the results have not been published. Individual locations of some species have been reported by Buresh & Zonkow (1932, 1934), Beshkov (1961, 1970), Tzankov & Stoyanov (2008), Naumov *et al.* (2011), etc., but generally the mountain can be considered poorly explored in herpetological terms.

The current study aims to clarify the species composition and richness, to analyze and to present contemporary maps of the distribution of the amphibians and reptiles in Vrachanska Planina Mts.

Material and Methods

Study area

Vrachanska Planina Mts. Is relatively well-defined part of the Western Stara Planina Mts. and according to the administrative division of Bulgaria it is situated in the districts Vratsa, Montana and Sofia.

In the available literature there are no well-defined descriptions of the borders of Vrachanska Planina Mts. Generally it is accepted that (according to Nikolov & Jordanova, 2002) Vrachanska Planina Mts. extends northeast of Dupnivrashka (Druzhevska) Ravine between Botunya River and Iskar River. The massif, which ends with the Lakatnishki Rocks in south and is separated by Mushatski Dol Ravine (Petrovski Dol Ravine) from the west and Turski Dol Ravine (Milanovska River) from the east, usually is not considered part of Vrachanska Planina Mts. (see Nenov & Chorchopov 1987, Vatkov 1987). In our opinion however, in orographic relation, this massif is more related to Vrachanska Planina Mts., rather than Koznitsa Mts., so we consider it part of Vrachanska Planina Mts. In the current paper we define the following borders of Vrachanska Planina Mts.: 1) from west to northwest – from the mouth of Proboynitsa River along its flow to the mouth of Petranski Dol River (called Mushatski Dol River in its upper part) and against the flow of Druzhevska Ravine and from there following Bela Reka River to its inflow into Botunya River; from there following Botunya River to its inflow into Matnitsa River; 2) from northeast – from the mouth of Matnitsa River against its flow of the confluence of a nameless left tributary and against its course to the southeast to level 280, from there along the Bela Bara River to its mouth, then upstream of Leva River. to isohypsis 400, then along the same isohypsis southeast to Darvodeltsi River and along the flow of the same river to its mouth; 3) from south – from the mouth of Darvodeltsi River, against the flow of Iskar River to the mouth of Proboynitsa River. In so defined boundaries, the study region (Fig. 1) covers an area of about 412 km^2, the lowest point is the mouth of the Matnitsa River (180 m a.s.l.), and the highest - Beglichka Peak (1482 m a.s.l.).

Vrachanska Planina Mts. consists mostly of Mesozoic, highly karst limestone. The ridge is wide and undulating, with numerous karst formations. The slopes are steep, often covered with screes (Kiradzhiev 1999, Nikolov & Jordanova 2002).

The climate is transitional between temperate and mountainous. The average annual temperature is 7°C. Rainfall is highest in May-June and lowest in February and August. The average annual rainfall reaches 1000 mm. The largest rivers with perennial flow are Leva River, Cherna River and Zlatitsa River, while the other rivers and streams often dry

up. Typical for the mountain are numerous springs, which also have a constant flow and are affected by the rains and melting snow (Vatkov 1987).

According to the classification of CORINE Land Cover (CLC 2006)[1] in Vrachanska Planina Mts. are dominating territories covered with forests and semi-natural vegetation (Class 3) - in average 78.15% of the total survey area, including forests (Class 3.1) – 47.33%, shrub and/or grass associations (Class 3.2) – 28.62% and open areas with scarce or no vegetation (Class 3.3) – 2.20%. Agricultural land (Class 2) occupies about 18.50% of the area of the region, and artificial land cover (Class 1) - about 2.20%.

Within the research area completely or partially fall the borders of Nature Park "Vrachanski Balkan" (about 292,5 km^2 of the territory of the mountain), reserve "Vrachanski Karst" (14,4 km^2), 5 protected areas and 5 natural monuments (in total about 13 km^2), and 4 protected zones for habitats from the Natura 2000 network (in total 342,8 km^2 of the mountain territory) (according to the "Register of protected territories and protected zones in Bulgaria", available at: http://eea.government.bg/en).

Data sources

For the purposes of the current study all documented observations of amphibians and reptiles from field studies of the authors in the territory of Vrachanska Planina Mts. are used, as well as those provided by colleagues. The time period of data collection is from 1955 to 2014, but the main amount of data (over 95% of the total) was collected after 1990s. All available scientific literature on Bulgarian herpetofauna (over 700 titles) has been reviewed and all data that refer or can be referred to the research area and meet the objectives of the current study are also used.

Databases, mapping and analysis

Most of the data (over 96% of the total) have precise geographic coordinates taken with GPS-receiver, derived from interactive satellite images (Google Earth 7.1.2) or interactive topographic maps with a scale of 1:50000 (Geographic Information System Works, http://gis.mrrb.government.bg/MRRB/). The data are unified and united in a single database where each unique record meets the registration of one or more individuals of a given species in a given place, a distance of not less than 10 meters from another. Entries that have precise geographic coordinates are referred to as "locations" hereinafter in the text. The altitude of the location is derived from the DEM[2] based on their coordinates. The database also includes part of the known from literature localities - those with geographic coordinates or localities that can be correctly mapped, based on their descriptions. The total number of records (unique registrations of species) in the database is 1481. The places where the individual species are found are described based on the distance and direction to the nearest village (by precision 0,1 km and one of the eight major and secondary geographic directions). In this sense, any kind of place whose description differs from other such locality by the name of the settlement, distance or direction (see the electronic Annex on: http://www.zoonotes.bio.uni-plovdiv.bg/additions/Herpetofauna Vr Mts.xlsx) is regarded as a separate locality. One locality may refer to one specific area, or several

[1] The ratio of the area is made in GIS-environment, based on overlaying the borders of the studied area with the vector layer of CLC2006, available online at: http://www.eea.europa.eu/data-and-maps/data/clc-2006-vector-data-version-2.

[2] Digital Elevation Model (a raster layer with resolution 40 × 40 m)

such localities, located in close proximity to one another, or it can reflect literature data without coordinates. With respect to the literature data, which cannot be mapped in the selected resolution, each unique geographical object is considered as a separate locality. This type of data is taken into account only in the context of reports of the presence of the species in the area but not included in the analyses.

Mapping of the distribution of the species is made in UTM[1] grid with a resolution of 1 × 1 km in the projection coordinate system "WGS 84 UTM 35N" and presented by centroids of squares, in which locations of the species fall. The codes of a 10x10 km squares (Fig. 1) are based on MGRS[2] in UTM Zone 34T, and those of the one-kilometer follow the same logic as the last two digits encode each one-kilometer square within that ten kilometers. Total one-kilometer squares, which falls in the studied area is 476, 349 of which are whole and 127 are partial.

Mapping, spatial data processing and visualization of maps are made by the program ArcGIS 10.1 (ESRI, Redlands, California, USA). Statistical parameters - median and percentiles used to describe the vertical distribution, are derived based on locations (n = 1430) of species, derived using the program STATISTICA (StatSoft Inc. 2011).

Taxonomic notes

The used Latin names of species are following mainly Stojanov *et al.* (2011), as the following subsequent taxonomic changes are reflected: 1) in respect of the species *Hyla arborea* complex, preliminary data indicate that in most of the country (incl. North Bulgaria) occurs the species *H. orientalis* (Gvoždik *et al.* 2015, Dufresnes *et al.* 2015); 2) regarding the representatives of the genus *Bufotes* Rafinesque 1814, there is still no data on the taxonomic status of the Bulgarian populations and thus the recorded specimens from this species in Vrachanska Planina Mts. are given under the combination *Bufotes viridis* (Laurenti, 1768), but with the addition of "complex"; 3) regarding the representatives of the genus *Anguis* Linnaeus 1758, only the name *Anguis colchica*, is used because all specimens found in the area have diagnostic features corresponding to this taxon.

[1] Universal Transverse Mercator

[2] Military Grid Reference System (spatially identical with UTM)

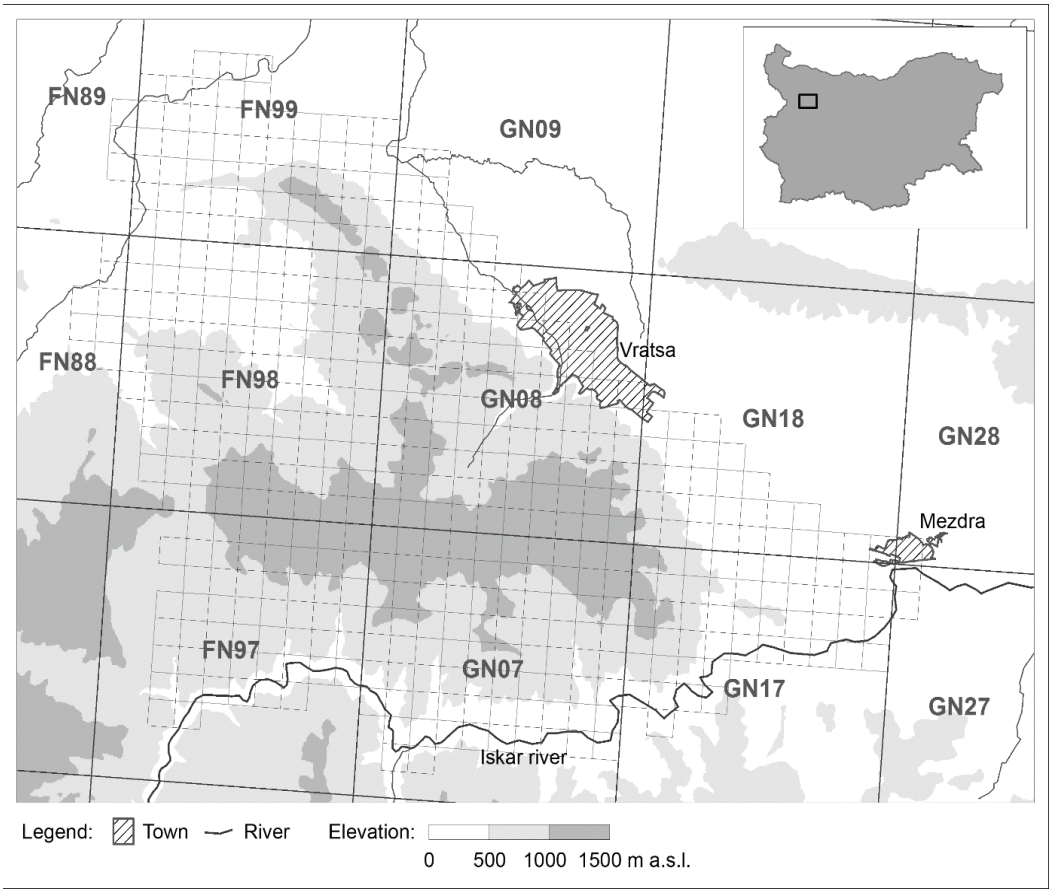


Fig. 1. Location of the study area in UTM-grid 10×10 and 1×1 km (from the one-kilometer squares are shown only the ones, in which falls the territory of Vrachanska Planina Mts.)

Results and Discussion

Species composition

Based on literary data there are 19 species of amphibians and reptiles (in 17 scientific publications issued between 1905 and 2011), reported for Vrachanska Planina Mts. As a result of our studies we confirmed the presence of each one of them and we identified 8 new species for the study area, bringing the total number of species which are known for the region, to 27, including 11 amphibians and 16 reptiles (below is given a list of registered species by classes, orders and suborders). The study area is characterized by the almost complete absence of species that are typical for the highest mountains in the country. From this group we recorded only one representative - *Rana temporaria*. Specific for the region is the presence of *Triturus cristatus* – a species established only in the northwest part of the country (Tzankov & Stojanov 2008, Wielstra *et al.* 2013). The species richness of Vrachanska Planina Mts. is higher than the adjacent Ponor Planina Mts. (20 species according to Popgeorgiev *et al.* 2014) and its species richness is comparable to that of

Vitosha Mts. (27 species according to Tzankov *et al.* 2014).

Having in mind the contemporary ideas for the overall distribution of the Amphibians and Reptiles in Bulgaria (see Stojanov *et al.* 2011) in our opinion finding other species in Vrachanska Planina Mts. can be considered unlikely, except in respect of the genus *Bombina* Oken 1816. Beškov *et al.* (1967) reported finding a *Bombina bombina* (Linnaeus 1761) at Brusen Village, which is located about 3 km from the eastern point of the study area. Although the locality has not been confirmed, it should be noted that it is likely to find this species in the easternmost parts of the mountain, where there are suitable habitats.

According to the distribution maps of the venomous snakes in Bulgaria, given by Buresch & Zonkow (1932) it appears that there is a locality of *Vipera berus* (Linnaeus, 1758) in Vrachanska Planina Mts. This locality is not the result of the authors' own data, but is quoted by an older source. When analyzing the origin of the data apparent discrepancy was noted. Kovachev (1905) reported *V. berus* locality "Vratza (Milin Kamak)". In a later publication the same author (Kovachev, 1912) in the listing the locations of *V. berus* in Bulgaria did not mention this locality, but the same place is given as a locality of *V. ammodytes*. Buresch & Zonkow (1932) quoting Kovachev (1905) refer to the locality of "Milin Kamak" for *V. berus*, but perceive the corresponding peak as part of Vrachanska Planina Mts., while on the map the symbol that corresponds to this locality is placed at a considerable distance (southwest) from the actual location of Milin Kamak Peak. In later study of the same authors (Buresch & Zonkow 1934), the locality is mapped in the same way, but this time with indicated altitude - 1200 m, which is also significantly different from the real altitude of the peak. Milin Kamak Peak is located about 13 km northeast of Vratsa Town and its maximum altitude is 463 m a.s.l. Having in mind the study of Stojanov *et al.* (2011) for the distribution and habitats of *V. ammodytes* and *V. berus* in Bulgaria, it seems much more likely that the locality "Milin Kamak" refers to *V. ammodytes* (as given by Kovachev, 1912), and not *V. berus*. The nearest certain localities of *V. berus* are in Ponor Mts. (see corresponding map in Popgeorgiev *et al.* 2014) and Koznitsa Mts. (namely Todorini Kukli Peaks, according to Kovachev (1912) and Westerström *et al.* (2010)), respectively about 13 km southwest and 15 km west from the boundaries of Vrachanska Planina Mts. In our opinion the existence of *V. berus* in Vrachanska Planina Mts. cannot be considered as proven and the species is not included in the checklist of the herpetofauna of the study area.

Checklist of the amphibians and reptiles in Vrachanska Planina Mts.

Classis Amphibia

Ordo Caudata

Salamandra salamandra (Linnaeus 1758) – this study

Lissotriton vulgaris (Linnaeus 1758) – Tzankov & Stoyanov (2008); this study

Triturus cristatus (Laurenti 1768) – Kowatscheff (1905)*; Kovachev (1912)*; Buresch & Zonkow (1941)*; Tzankov & Stoyanov (2008); this study

Triturus ivanbureschi Arntzen et Wielstra 2013 – this study

Ordo Anura

Bombina variegata (Linnaeus 1758) – Buresch & Zonkow (1942); Beškov (1972); this study

Bufo bufo (Linnaeus 1758) – Beškov (1972); this study

Bufotes viridis complex – Beškov (1972); this study
Hyla orientalis Bedriaga 1890 – Tzankov & Stoyanov (2008); this study
Pelophylax ridibundus (Pallas 1771) – Tzankov & Stoyanov (2008); this study
Rana dalmatina Fitzinger 1839 – Tzankov & Stoyanov (2008); this study
Rana temporaria Linnaeus 1758 – this study

Classis Reptilia
Ordo Testudines
Emys orbicularis (Linnaeus 1758) – this study
Testudo graeca Linnaeus 1758 – Beškov *et al.* (1967); this study
Testudo hermanni Gmelin 1789 – this study
Ordo Squamata: Subordo Sauria
Anguis colchica (Nordmann 1840) – Buresch & Zonkow (1933); Beškov (1966); this study
Ablepharus kitaibelii Bibron et Bory de St-Vincent 1833 – Beškov (1961); this study
Darevskia praticola (Eversmann 1834) – Naumov (2005); this study
Lacerta agilis Linnaeus 1758 – this study
Lacerta viridis (Laurenti 1768) – this study
Podarcis muralis (Laurenti 1768) – Buresch & Zonkow (1933); this study
Podarcis tauricus (Pallas 1814) – this study
Ordo Squamata: Subordo Serpentes
Coronella austriaca Laurenti 1768 – Kovachev (1905, 1912); Buresch & Zonkow (1934); this study
Dolichophis caspius (Gmelin 1789) – Beshkov (1964); this study
Natrix natrix (Linnaeus 1758) – Buresch & Zonkow (1934); this study
Natrix tessellata (Laurenti 1768) – Naumov *et al.* (2011); this study
Zamenis longissimus (Laurenti 1768) – Kovachev (1905, 1912); this study
Vipera ammodytes (Linnaeus 1758) – Kovachev (1905); Buresch & Zonkow (1932, 1934); Beškov (1961); Christov & Beshkov (1999); this study

* The species affiliation of the crested newts from the localities „Vratza", „Vratza (Skaklya)" and „The puddles near Vratza" (given by Kowatscheff (1905), Kovachev (1912) and Buresch & Zonkow (1941), respectively) is not exactly known, but in the current study they are given as *T. cristatus*.

Distribution

Currently, for all recorded species of amphibians and reptiles in Vrachanska Planina Mts. there are totally 1276 known localities, of which 1236 are new, eight are mentioned in literature and confirmed with new data, and only 32 are based only on literary data (in Appendix 1 is given a table with the total number of species and localities and origin of the data for the individual species). The total number of the known localities that can be correctly mapped into the one-kilometer UTM-network is 1255. The mapped localities for all species fall within 236 squares (Fig. 2), which is about 50% of the number of squares, falling within the Vrachanska Planina Mts. The least explored territories are distributed: 1) in the western part - the massif between the Bela River and Cherna River; 2) in the central part - the area between Buk Peak and Okolchitsa Peak; 3) in the eastern part - the area between Chelopek Village and Mezdra Town.

Figure 3 shows the ratio of the number of squares, where species have been recorded and the total number of squares from which there is data about amphibians and reptiles in the study area. The largest number of squares with established presence was observed in two species of reptiles - *Podarcis muralis* and *Lacerta viridis*, and two species of amphibians - *Pelophylax ridibundus* and *Bombina variegata*. Given the nature of their distribution (see below), these four species can be considered the most common representatives of the herpetofauna in Vrachanska Planina Mts.

The distribution of registered locations of the species according to the altitude is shown in Fig. 4 and is discussed separately for the main systematic groups.

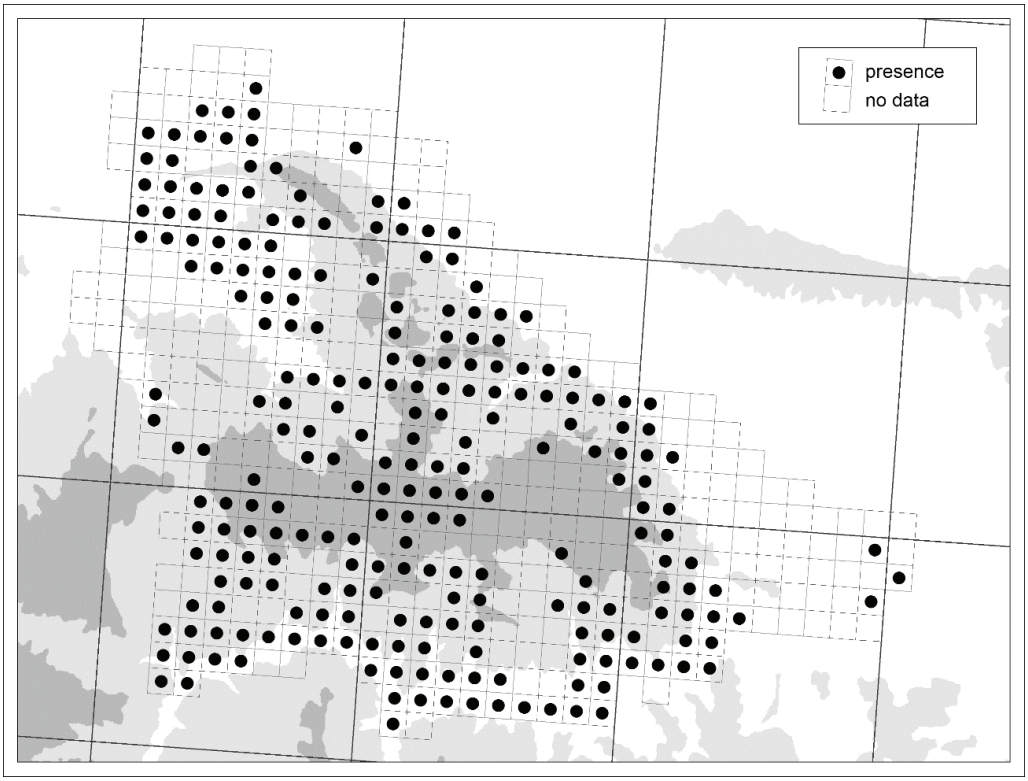


Fig. 2. Distribution of all known localities of amphibians and reptiles in Vrachanska Planina Mts. in UTM-grid 1×1 km.

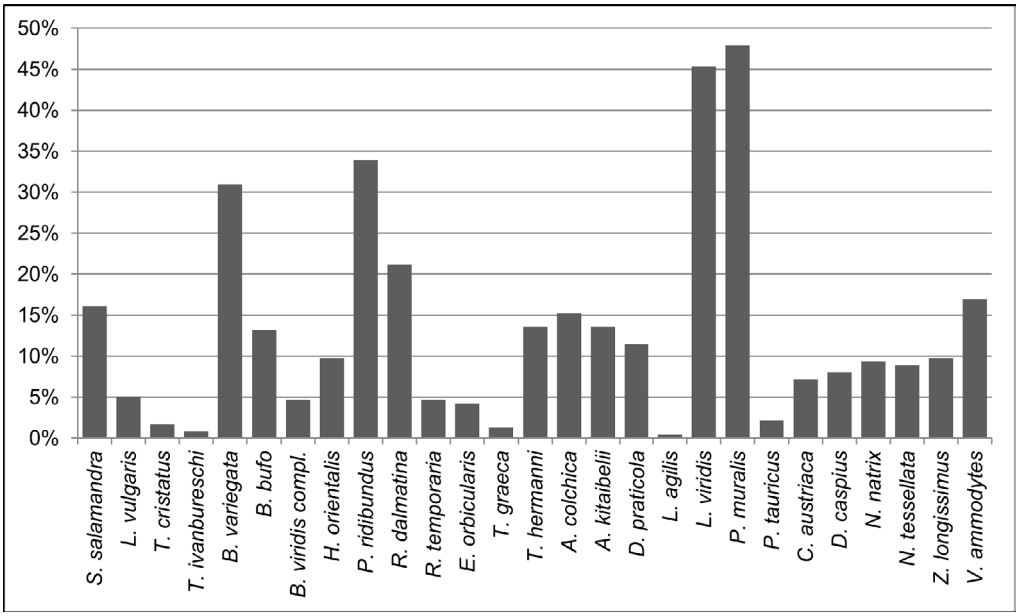


Fig. 3. Percentage ratio of the number of UTM-squares, in which there are recorded species and the total number of squares (n=236) with registered presence of amphibians and reptiles in Vrachanska Planina Mts.

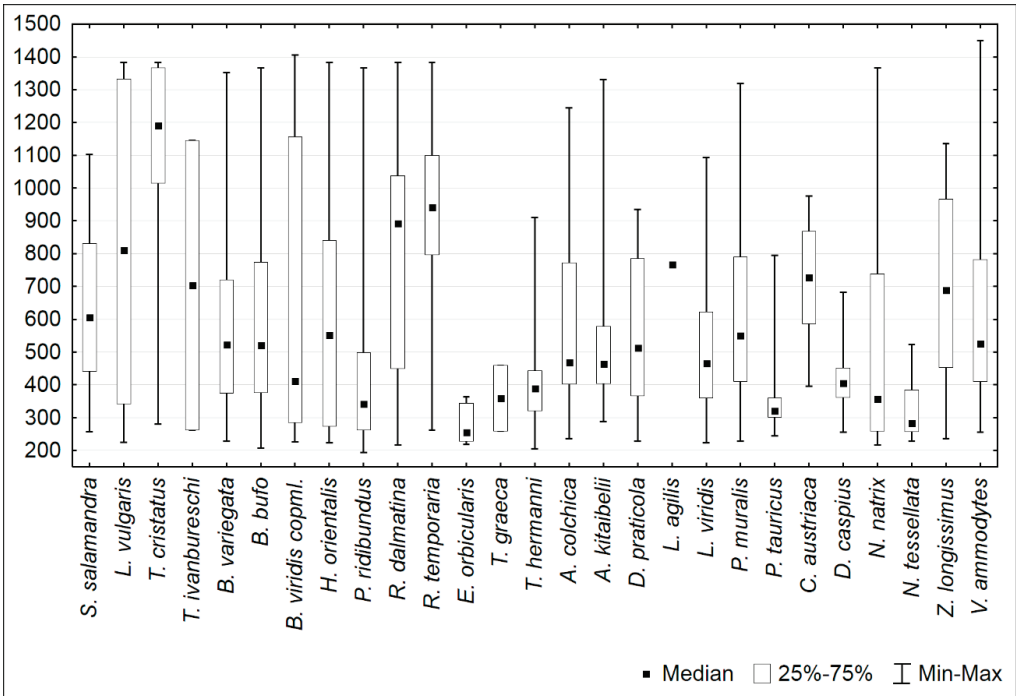


Fig. 4. Altitude distribution of the localities (n=1427) of the species of amphibians and reptiles in Vrachanska Planina Mts.

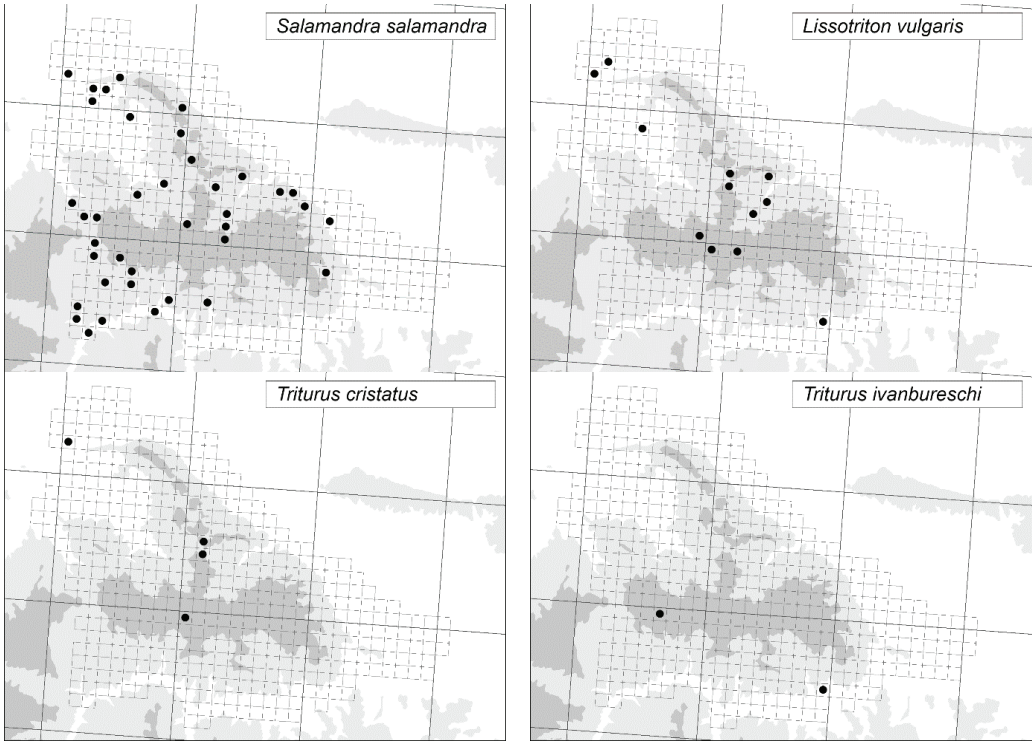


Fig. 5. Maps of the distribution of the amphibians from the order Caudata in Vrachanska Planina Mts. (UTM-grid 1×1 km).

Amphibians - Order Caudata

The tailed amphibians in Vrachanska Planina Mts. are presented with four species as all known localities fall in 48 UTM-square (Fig. 5). The individual species seem to have different pattern of distribution, although in all species a comparatively wide elevation range was observed (Fig. 4). *Salamandra salamandra* probably occurs everywhere, where there are suitable habitats, while the distribution of the newts is more sporadic. This can be explained by species-specific requirements to the nature of the ponds for breeding (see Stojanov *et al.* 2011) - *S. salamandra* breeds mainly in streams, springs, fountains etc., which can be seen throughout the territory of the mountain. The crested newts breed exclusively in standing water bodies, which are scarce in the area. *Lissotriton vulgaris* also prefers standing waters, but it can breed in very small water basins, such as puddles in the road ruts, ditches, water fountains, etc. and sometimes even small streams (5 adult individuals were observed in a small stream 1 km north of Zgorigrad Village on 05.26.1998 by K. Donchev). Regarding *Triturus cristatus* and *T. ivanbureschi* - the absence of the first species from the southern part of the mountain, and the absence of the second species from the north, can be explained with the patterns of the areals of the two species. The localities of *T. cristatus* in Vrachansk Planina Mts. mark the southernmost line of the species range (Tzankov & Stoyanov 2008) and the localities of *T. ivanbureschi* outline the most northwestern limit of the species range in Bulgaria. In this sense, the territory of Vrachanska Planina Mts. can be regarded, as the contact area between the two taxa. An evidence for the last statement is the study by Wielstra *et al.* (2013) who recorded introgression of mtDNA from *T. ivanbureschi* in specimens of *T. cristatus*, caught in the basin, north of Ochindol Village (UTM: GN0709) and Kalna Matnitsa Cave (Toshovata Dupka Cave) northeast of Stoyanovo Village (UTM: FN9902).

Amphibians - Order Anura

We recorded 8 anuran species from 4 families in the study area. All known localities fall in totally 153 UTM squares (Fig. 6). With highest number of localities are *Pelophylax ridibundus* and *Bombina variegata*. The first species is recorded in all parts of the study area and the second one is found only in the most eastern and northern parts of the mountain, which are with the lowest altitude (but are least researched). It must be noted, that some peculiarities in the biology and the ecology of some anurans can be a prerequisite to subjective assessment of their distribution: *P. ridibundus* and *B. variegata* remain near the water throughout almost the whole year, while the other 5 species, as a rule leave the water basin right after the breeding season and throughout the rest of their active season they inhabit the dry land, where they are active mainly during the night (especially the toads).

That makes them harder to spot than *P. ridibundus* and *B. variegata*. Amongst the other anurans, recorded in Vrachanska Planina Mts. *Rana dalmatina*, *Hyla orientalis*, *Bufo bufo* and *Bufotes viridis* complex are spread widely, as the absence of localities of the two toad species in the eastern part of the mountain is probably due to the lower research rate of this. All species have very wide vertical distribution (Fig. 4), covering almost completely the altitude range of the study area. However, most of the locations of *B. variegata*, *B. bufo* and *H. orientalis* are concentrated under 800 m a.s.l. and those of *P. ridibundus* - below 500 m a.s.l. *R. temporaria* on the other hand is recorded mainly above 800 m a.s.l.

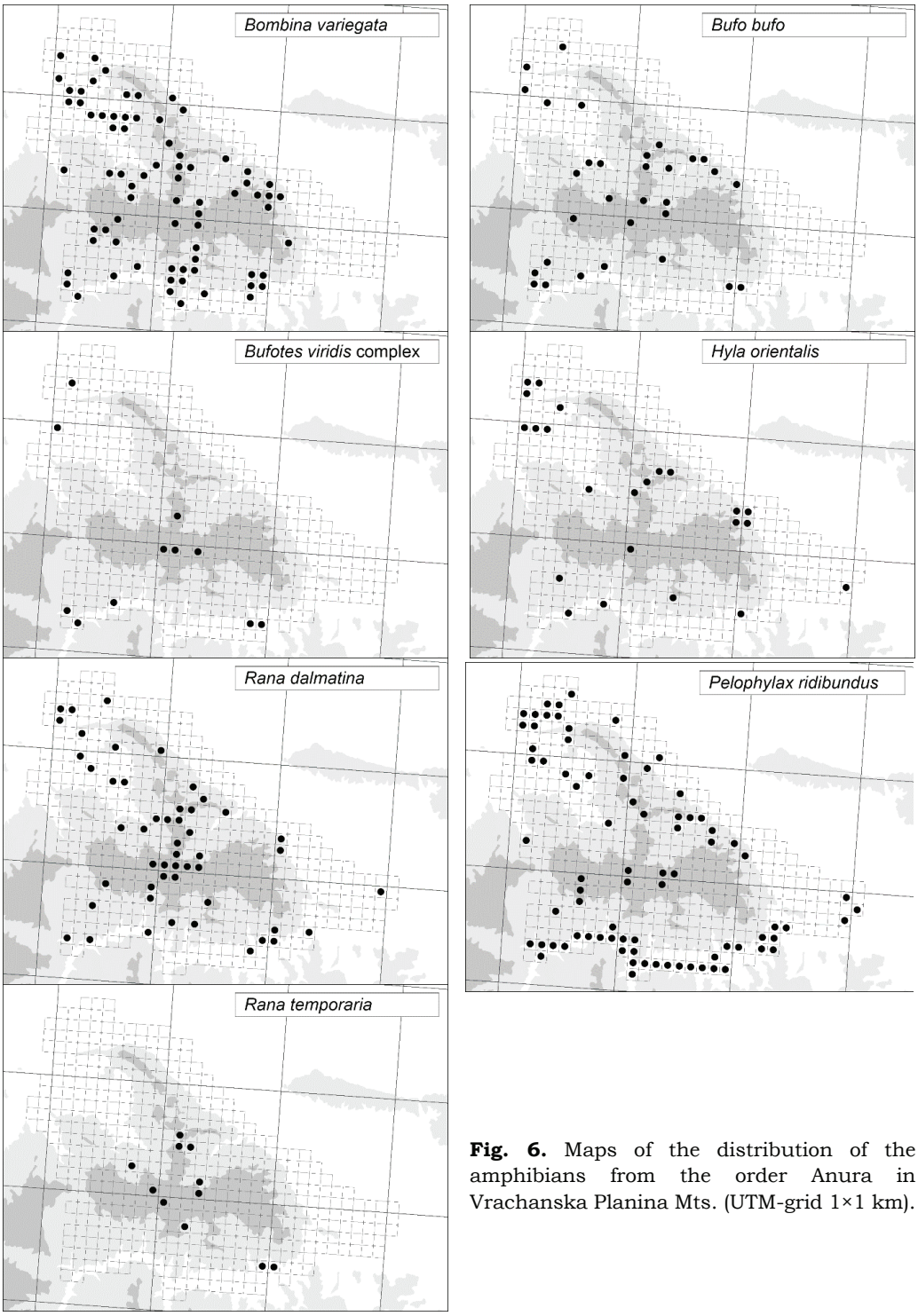


Fig. 6. Maps of the distribution of the amphibians from the order Anura in Vrachanska Planina Mts. (UTM-grid 1×1 km).

The registered patterns in the vertical distributions of the species is related to the availability of suitable breeding basins and the species, which are more unassuming in this matter (namely *B. viridis* complex and *R. dalmatina*), show the widest vertical range. Specific distribution in Vrachanska Planina Mts. seems to have only *R. temporaria*, which is found mainly in the central, highest part of the mountain. The localities northeast of Zverino Village (UTM: GN1704 and GN0794) are small water basins (260 m a.s.l.), in which the species is recorded multiple times, during the breeding season. Meanwhile, these localities represent the places with the lowest altitude of the species in Bulgaria (Stojanov *et al.* 2011). Having in mind the described by Beshkov & Angelova (1981) ability of *R. temporaria* to perform long migrations to suitable breeding ponds and back to terrestrial habitats, it can be assumed that in this case we observed a similar phenomenon: during most of the year the frogs probably inhabit the ridges of the mountains north of Zverino Village (this part of the mountain is poorly studied), but due to lack of suitable breeding sites in the nearby surroundings, the frogs make annual migrations to the mentioned above waters basins.

Reptiles – Order Testudines

We recorded 3 species of turtles from two families in Vrachanska Planina Mts., where the known total localities fall in 39 UTM squares (Fig. 7). All three species have relatively narrow vertical ranges (Fig. 4) and are absent from the highest central parts of the mountain. *Emys orbicularis* is distributed in the northwestern part of the study area (Botunya River and its tributaries) and sporadically in Iskar River. This species occurs in low vertical range of locations (below 400 m a.s.l.) and the nature of its distribution may be determined by the lack of suitable water basins in the higher parts of the mountain (the ponds near Parshevitsa challet are over the maximum altitude for the species in the country, up to about 1100 m a.s.l., according Stojanov *et al.*, 2011). The largest number of localities was identified for *Testudo hermanni* and they are mainly concentrated in the northwestern part of the study area and to a lesser extent along Iskar River. Particularly interesting are the localities of *T. graeca*, as Vrachanska Planina Mts. is located outside the main range of the species in Bulgaria (see Stojanov *et al.*, 2011). In all three known localities of this species we recorded only single specimens (see Fig. 7): FN9902 - 1 ind. (Beshkov *et al.*, 1967); FN9961 - remains of shells under the nests of birds of prey (found in the late 80s and in the late 90s of the twentieth century, respectively R. Todorov and Georgi Stoyanov); FN9941 - single egg (in July 2006, obs. D. Stoyanov and B. Petrov). It should be noted that tortoises are often involuntarily resettled by people and currently we cannot decide, whether the found *T. graeca* are part of small numbered, local population or are resettled from elsewhere.

Reptiles – Order Squamata: Suborder Sauria

In the study area we recorded seven lizard species from three families. All known localities fall in 169 UTM squares (Fig. 8). The registered range of vertical distribution (Fig. 4) is wide in *Anguis colchica, Ablepharus kitaibelii* and *Podarcis muralis*, while the other species are limited to some extent, possibly because of specific habitat preferences. The largest number of known localities belongs to *Podarcis muralis* and *Lacerta viridis*, the second species does not seem to occur in the highest part of the mountain. Three other species - *Anguis colchica, Ablepharus kitaibelii* and *Darevskia praticola* are met sporadically throughout the mountain. The distribution of the remaining two species of lizards seems to be very limited.

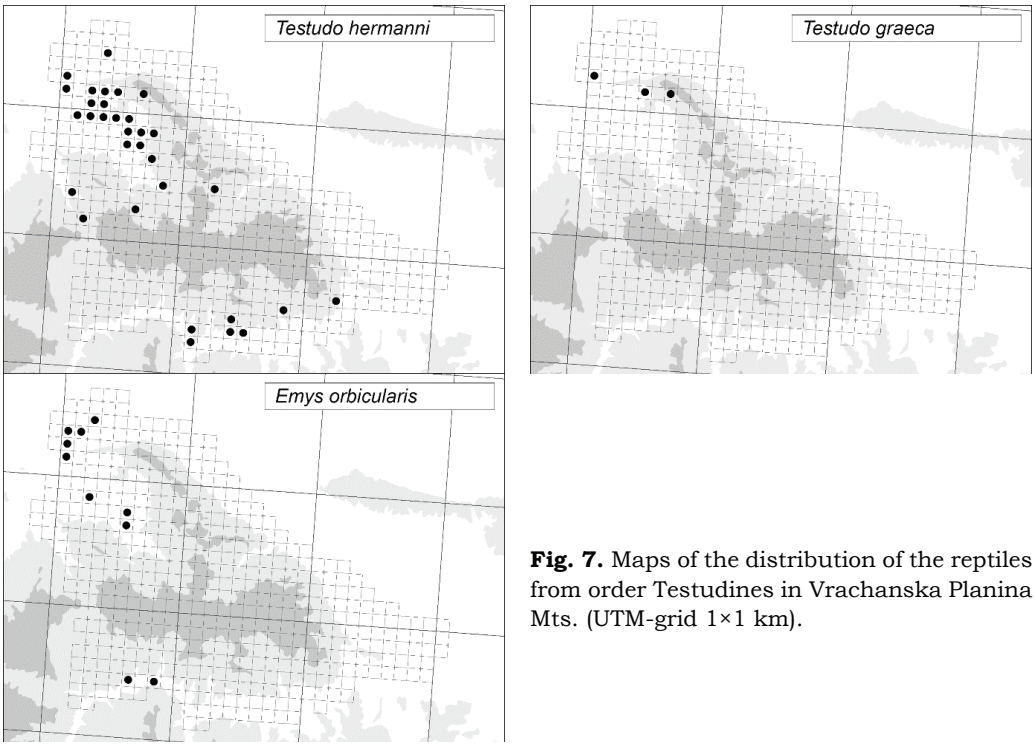


Fig. 7. Maps of the distribution of the reptiles from order Testudines in Vrachanska Planina Mts. (UTM-grid 1×1 km).

The localities of *Podarcis tauricus* likely outline the boundary of penetration of the species from the Danube Plain southward towards the Stara Planina Mts. The locality near Chelopek Village (GN1718; 795 m a.s.l.) is one of the highest known localities of this species in Bulgaria (according Stojanov *et al.* 2011 *P. tauricus* usually does not reach 500 m a.s.l., and only in Slavyanka Mts. is limited to about 1000 m a.s.l.). *Lacerta agilis* is known from Vrachanska Planina Mts. by only one specimen found in Milanovo Village (16.06.1999, obs. V. Beshkov). Subspecies affiliation of the observed specimen has not been identified. In the neighbouring Ponor Planina Mts. and in the higher parts of the western Stara Planina Mts., located northwest of Vrachanska Planina Mts., only *L. a. bosnica* Schreiber, 1912 occurs (see Popgeorgiev *et al.* 2014 and Stojanov *et al.* 2011).

Reptiles – Order Squamata: Suborder Serpentes

In Vrachanska Planina Mts. six snake species from two families are registered. All known localities fall in total 91 UTM squares (Fig. 9). Two species - *Dolichophis caspius* and *Natrix tessellata*, seem to be absent from the high central part of the mountain, which can be explained by the influence of the altitude on the climatic conditions, as well as the lack of suitable habitats. Both species are widespread in Bulgaria, but as a rule prefer low and warm areas. *Dolichophis caspius* usually reaches 800-1100 m a.s.l. (Stojanov *et al.*, 2011), although in Southwestern Bulgaria is located up to 1580 m a.s.l. (Beškov, 1974). *Natrix tessellata* reaches 1420 m a.s.l. in Southwest Bulgaria (Tzankov *et al.*, 2011), but not in North Bulgaria, where all localities are below 700 m a.s.l. (Naumov *et al.*, 2011).

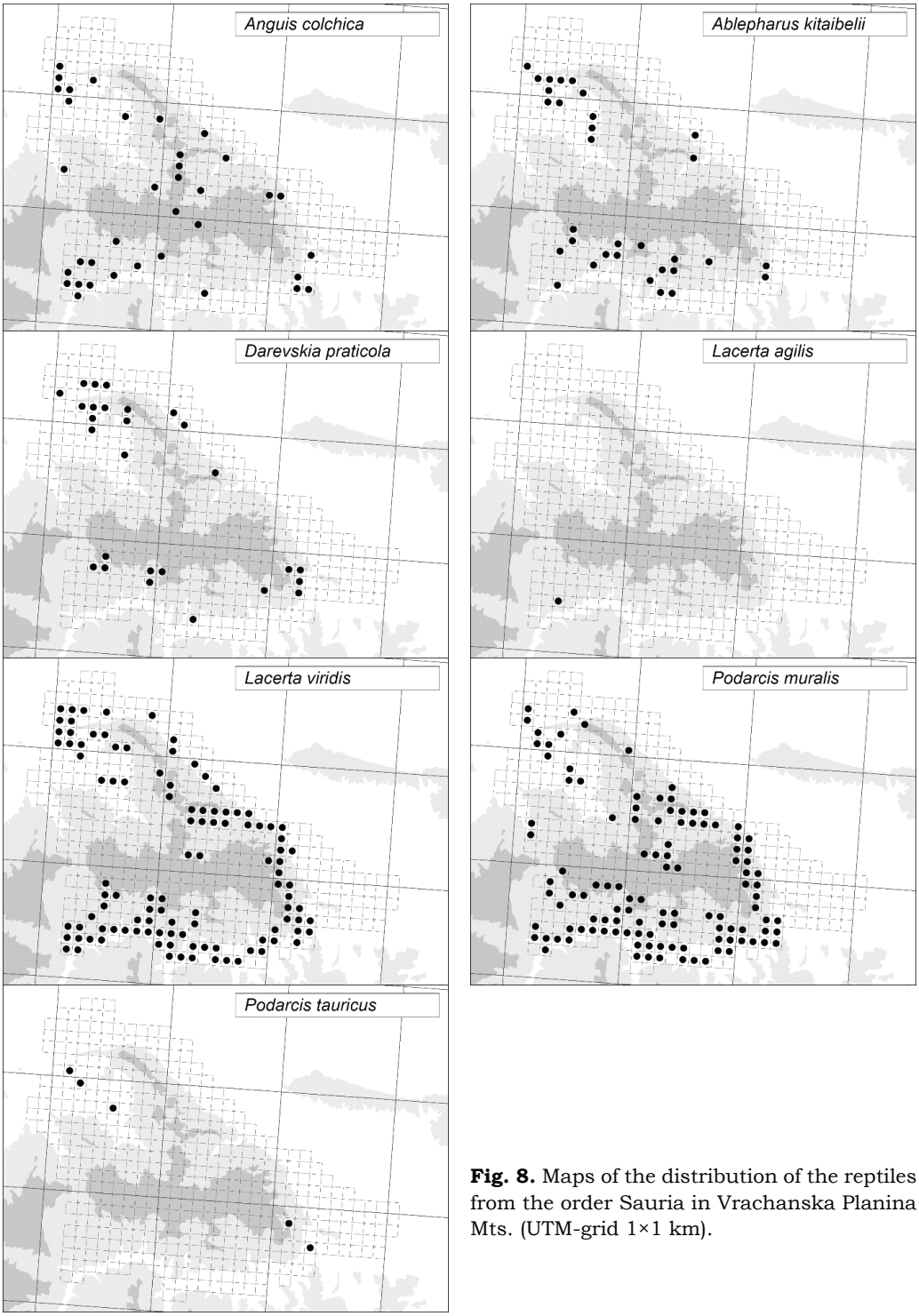


Fig. 8. Maps of the distribution of the reptiles from the order Sauria in Vrachanska Planina Mts. (UTM-grid 1×1 km).

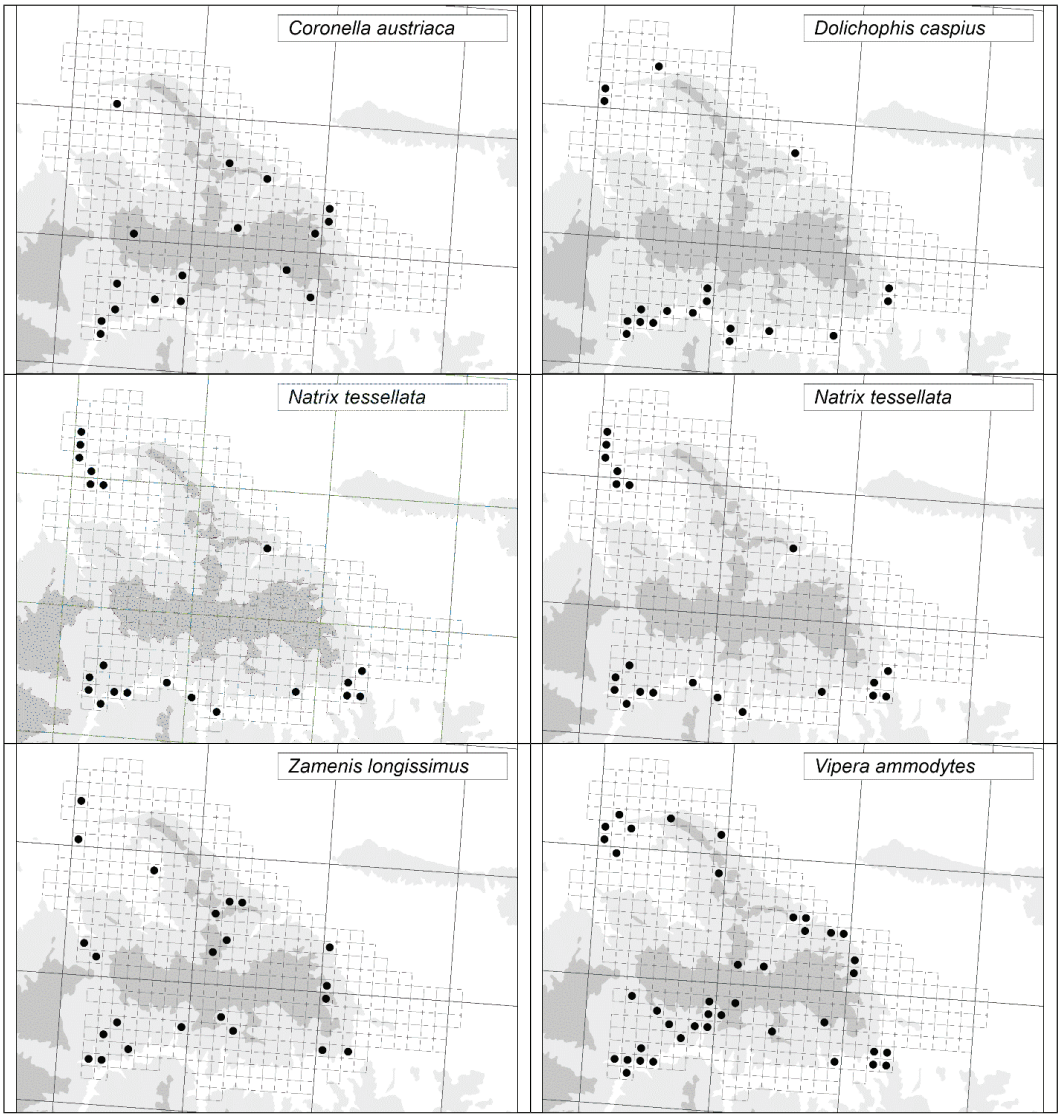


Fig. 9. Maps of the distribution of the reptiles from the order Serpentes in Vrachanska Planina Mts. (UTM-grid 1×1 km).

The other four snake species - *Vipera ammodytes, Zamenis longissimus, Natrix natrix* and *Coronella austriaca* are observed sporadically in almost the entire territory of the Vrachanska Planina Mts. All four species are widespread in Bulgaria from sea level up to over 1500 m a.s.l. (see Stojanov *et al.* 2011). Widest altitude range covering almost entirely that of the study area, was registered for *V. ammodytes* and *N. natrix* (Fig. 4). From the two subspecies of *V. ammodytes,* occurring in Bulgaria, in the Vrachanska Planina Mts. only *V. a. ammodytes* is found, which corresponds to the perception of the distribution ranges of the two taxa (see Stojanov *et al.* 2011). The location east of the Parshevitsa Peak (UTM: GN0718; 1450 m a.s.l.), reported by Beškov *et al.* (1961) is the highest known for *V. a. ammodytes* in the country. The closest known locality of the other subspecies - *V. a. montandoni* Boulenger 1904, is located approximately 20 km to the east, near the Hubavene Village (unpublished data N. Tsankov).

Species richness

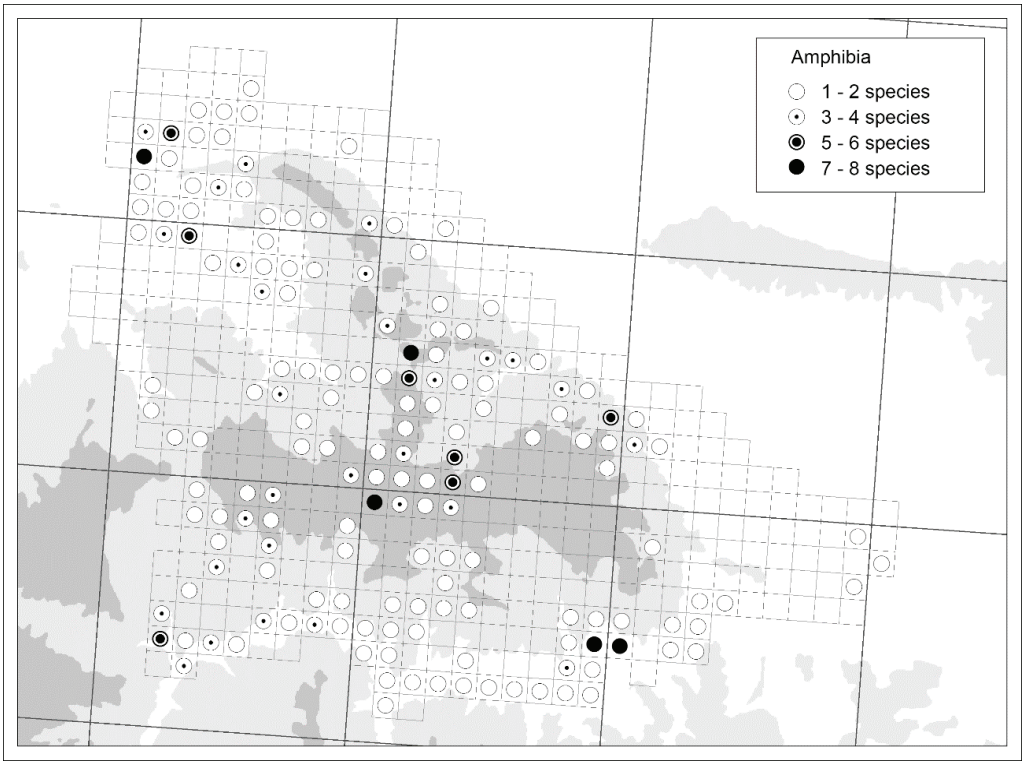
Regarding the number of species, the one-kilometer UTM squares, which fall into the territory of Vrachanska Planina Mts. are grouped in four categories, separately for amphibians and reptiles (Fig. 10). The largest number of species (7 amphibian and 10 reptile species) was recorded in square FN9902 (northeast of Stoyanovo Village).

The maximum number of amphibian species was 8, recorded in squares GN0709 and GN0815. The spatial distribution of the squares with the largest number of amphibian species (7 or 8 species) corresponds largely to the positions of the standing water basins: FN9902 – micro dam under the spring of Matnitsa River; GN0815 – two small, shallow basins, south from Peshka Peak; GN0709 – the three basins between Parshevitsa Peak and Beglichka Mogila Peak; GN0794 – small swamp, near the left bank of Iskar River, northeast of Zverino Village. In 3 of the 8 squares, where 5 or 6 species are recorded, there are also standing water basins: FN9913 – swampy floods of Matnitsa River; GN0814 – part of a water basin under Peshka Peak; GN1704 – shallow swamp on the left bank of Iskar River, northeast of Zverino Village (near the mentioned above GN0794). In the rest of the squares from the same category there are no standing water basins, but there are constantly flowing rivers and streams. It should be noted that the registered high species richness is probably due not only to the presence of suitable habitats (wetlands), but also due to the fact that these squares are situated on the most visited by us parts of the mountain. For example the other existing standing water basins (except for the mentioned above) in the area (the dam lake south of Glavatsi Village – FN9924 and FN9934; the basin northeast of Milanovo Village – FN9768 and FN9769; and the water basin, northeast of Beglichka Mogila Peak – GN0729) are less visited and the number of the recorded amphibians there does not exceed three species.

The maximum number of reptile species in single square is 10 (FN9902). A clustering of squares with 5 or more recorded species is notable at the area of Gara Laktnik Village, Opletnya Village and Milanovo Village (UTM 10x10 km square - FN97), in the area of Stoyanovo Village and Dolno Orizovo Village (FN99), as well as the area north of Cherepish Train station (GN17). Large number of species are recorded also in the Vratsata Area (GN0855). All mentioned regions are characterized with relatively low altitude and diverse micro relief and land cover, which by itself is a prerequisite for the existence of large number of reptiles. On the other hand these areas are situated in the most visited by us parts of the mountain, so similar species richness may be expected in other squares as well, with similar conditions, which are not well researched yet. The highest central part of the mountain seems considerably poor in reptiles – for example in the areas of Beglichka Mogila Peak and Parshevitsa Peak (GN0709) only one reptile species was recorded, regardless the fact that these areas are visited multiple times.

Conservation

The conservation status of the registered amphibians and reptiles in Vrachanska Planina Mts. is presented in Annex 2. Twenty three species are strictly protected by at least one of the three active laws and conventions for protecting biodiversity: The Biodiversity Act (BA), Council Directive 92/43/EEC (Directive 92/43) and the Bern Convention. With the highest level of protection (Annex II of BA and Annex II of Directive 92/43) are *Triturus cristatus*, *T. ivanbureschi*, *Bombina variegata*, *Emys orbicularis*, *Testudo graeca* and *T. hermanni*. Three of these species (*T. cristatus*, *T. graeca* and *T. hermanni*) are included in



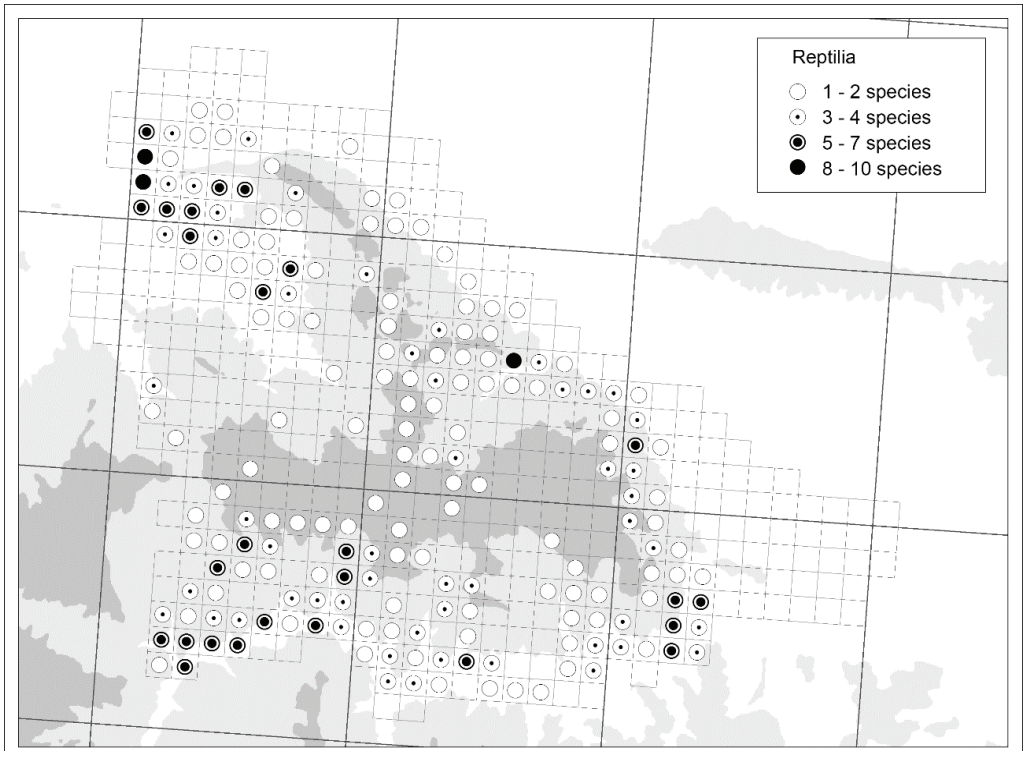


Fig. 10. Herpetofaunal species richness in Vrachanska Planina Mts. (UTM-grid 1×1 km).

the Red Data Book of Bulgaria (Golemanski *et al.* 2015), and *T. graeca* is categorized as „Vulnerable“ in the Red List of IUCN.

Real protection of the species in the study area may be expected only in the territories in which there is active protection (patrolling guard) - Nature Park "Vrachanski Balkan" (occupying about 71% of the area of the mountain) and reserve "Vrachanski Karst" (about 3% of the area of the mountain). Most of the territory of Vrachanska Planina Mts. falls within the four protected zones for the habitats of the Natura 2000 network (around 83% of the area of the mountain). The ratio of the number of locations within the park, reserves and protected areas Natura 2000, and the total number of locations of the amphibian and reptile species registered in Vrachanska Planina Mts. is shown in Fig. 11. 1029 locations of 25 species (about 72 % of all analyzed locations) fall within the parks boundaries. Two species, found in Vrachanska Planina Mts. - *Lacerta agilis* and *Emys orbicularis*, have not been proven to be present in the park. The first species is known for the mountain with only one specimen and the nature of its distribution in the region is unknown. The localities of the second species are located close to the borders of the park, but not in the park itself (there is one known locality without exact coordinates, which may arbitrarily be referred to the park – Iskar River, near Opletnya Village). On the territory of the reserve 13 species have been identified, which is about 48% of the species known from the mountain. The number of locations in the reserve is small - about 6% of all analyzed locations, due to the relatively small area. The protected zones of the Natura 2000 network cover most of the locations of all identified in Vrachanska Planina Mts. species (between 69 and 100% of the locations of individual species; totally about 92% of all analyzed locations).

Regarding the amphibians in general, all one-kilometer UTM squares, in which five or more species are recorded (12 squares) fall within the boundaries of protected zones of Natura 2000, and 9 of them are wholly or partly situated in the limits of the nature park. In regards of the reptiles - also almost all the squares in which 5 or more species have been registered fall within the limits of the protected zones (27 of the 28 such squares), and 24 of these squares fall wholly or partly in the park - one of them falls in the reserve.

During the field studies in Vrachanska Planina Mts. in the recent years we registered some potential threats to amphibians and reptiles. The most significant among them can be defined as follows:

1) Drying-up of the water basins. In 2012, it was found that the little morass, northeast of Zverino Village (UTM: GN0794) is spattered with dirt as a result of the afforestation of the terrace of Iskar River in this region (in the vicinity of the area there is placed sign, announcing this activity). The swamp is one of the places with the highest diversity of amphibians in Vrachanska Planina Mts. Other two ponds located in the highest part of the mountain about 1 km north of Parshevitsa Peak (UTM: FN9890) are dried up for at least 15 years.

2) Fires. In the vicinity of the villages Gorno Ozirovo and Dolno Ozirovo were observed numerous traces of fires. In this area are located most of the known localities of *Testudo hermanni*, which (together with *T. graeca*) is highly vulnerable to fires (Popgeorgiev & Kornilev 2009).

3) Road mortality. Trampled amphibians and reptiles were found on the road between Gara Lakatnik Village and Lyutibrod Village (4 species); between Gara Lakatnik Village and Gorno Pole Village (4 species); between Ledenika Cave and Parshevitsa Hut (3 species); between Lyutibrod Village and Chelopek Village (1 species) and between Vratsa Town

and Zgorigrad Village (1 species). The recorded dead specimens belong to three species of amphibians (*Salamandra salamandra, Bufo bufo* and *Bufotes viridis* complex) and 6 species of reptiles (*Anguis colchica, Dolichophis caspius, Natrix natrix, N. tessellata, Zamenis longissimus* and *Vipera ammodytes*).

It should be noted that in this study the threats were not subject of the field studies, therefore their real significance remains unknown. We recommend that in the preparation of the management plans for the nature park and the protected zones, there should be planned and conducted targeted studies that would justify the conservational problems and threats and concrete measures should be taken to eliminate or mitigate them.

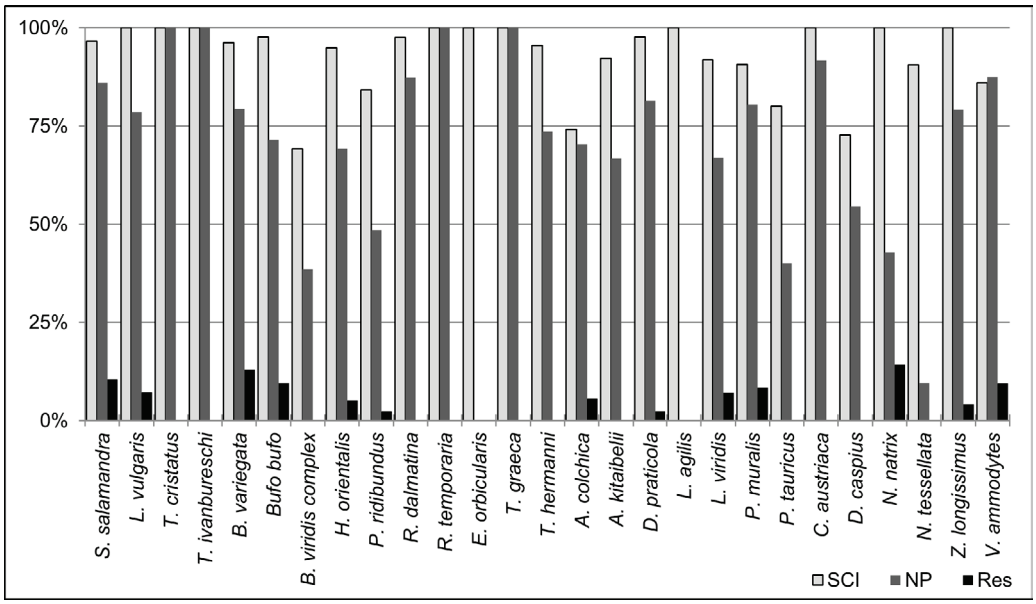


Fig. 11. Percentage ratio of the number of locations in the protected zones (SCI), the nature park (NP) and the reserve (Res), and the total number of locations of amphibians and reptiles in Vrachanska Planina Mts. (n = 1430).

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Appendix 1

Number of localities and UTM-quadrats, in which they occur.

Species	LoccN	LoccP+N	LoccP	LoccT	UTM
Salamandra salamandra	51	0	0	51	38
Lissotriton vulgaris	11	3	0	14	12
Triturus cristatus	4	2	3	9	4
Triturus ivanbureschi	2	0	0	2	2
Bombina variegata	124	0	2	126	73
Bufo bufo	39	0	1	40	31
Bufotes viridis complex	11	0	1	12	11
Hyla arborea	34	1	0	35	23
Pelophylax ridibundus	116	1	0	117	80
Rana dalmatina	65	1	0	66	50
Rana temporaria	17	0	0	17	11
Emys orbicularis	10	0	0	10	10
Testudo graeca	2	0	1	3	3
Testudo hermanni	64	0	0	64	32
Ablepharus kitaibelii	40	0	2	42	36
Anguis colchica	50	0	2	52	32
Darevskia praticola	39	0	1	40	27
Lacerta agilis	1	0	0	1	1
Lacerta viridis	156	0	0	156	107
Podarcis muralis	228	0	1	229	113
Podarcis tauricus	5	0	0	5	5
Coronella austriaca	17	0	3	20	17
Dolichophis caspius	22	0	1	23	19
Natrix natrix	27	0	1	28	22
Natrix tessellata	17	0	4	21	21
Zamenis longissimus	24	0	1	25	23
Vipera ammodytes	60	0	8	68	40

Legend:
LoccN – number of localities, based only on new (unpublished) data; LoccP+N – number of localities, based on published and new data; LoccP – number of localities, based only on published data; LoccT – total number of known localities; UTM – number of 1x1 UTM-squares, in which the localities occur (based on the total number of known localities).

Appendix 2

Conservation status of the species and their presence/absence in nature park "Vrachanski Balkan", reserve "Vrachaski Karst" and the protected zones from the Natura 2000 network.

Species	BDA	Dir	BC	RDB	IUCN	NP	RE	SCI
Salamandra salamandra	III	-	III	-	LC	+	+	+
Lissotriton vulgaris	III	-	III	-	LC	+	+	+
Triturus cristatus	II, III	II, IV	II	VU	LC	+	-	+
Triturus wanbureschi	II, III	II, IV	II	-	LC	+	-	+
Bombina variegata	II, III	II, IV	II	-	LC	+	+	+
Bufo bufo	III	-	III	-	LC	+	+	+
Bufotes viridis complex	III	IV	II	-	LC	+	-	+
Hyla orientalis	III	IV	II	-	LC	+	+	+
Pelophylax ridibundus	IV	V	III	-	LC	+	+	+
Rana dalmatina	-	IV	II	-	LC	+	-	+
Rana temporaria	IV	V	III	-	LC	+	-	+
Emys orbicularis	II, III	II, IV	II	-	NT	-	-	+
Testudo graeca	II, III	II, IV	II	EN	VU	+	-	+
Testudo hermanni	II, III	II, IV	II	EN	NT	+	-	+
Anguis colchica	III	-	III	-	-	+	+	+
Ablepharus kitaibelii	III	IV	II	-	LC	+	-	+
Darevskia praticola	-	-	III	-	NT	+	+	+
Lacerta agilis	III	IV	II	-	-	-	-	+
Lacerta viridis	III	IV	II	-	LC	+	+	+
Podarcis muralis	III	IV	II	-	LC	+	+	+
Podarcis tauricus	III	IV	II	-	LC	+	-	+
Coronella austriaca	III	IV	II	-	-	+	-	+
Dolichophis caspius	III	IV	II	-	-	+	-	+
Natrix natrix	-	-	III	-	LC	+	+	+
Natrix tessellata	III	IV	II	-	-	+	-	+
Zamenis longissimus	III	IV	II	-	LC	+	+	+
Vipera ammodytes	III	IV	II	-	LC	+	+	+

Legend:

BDA – appendix number in the Biological Diversity Act of Bulgaria (accessible on-line at http://www.moew.government.bg/?show=top&cid=227&lang=en); Dir – appendix number in the Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (accessible on-line at http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:01992L0043-20070101); BC – appendix number in the Convention on the Conservation of European Wildlife and Natural Habitats, Bern, 19.IX.1979 (accessible on-line at http://conventions.coe.int/Treaty/en/Treaties/Html/104.htm); RDB – abbreviation of the category in the Red Data Book of Bulgaria (accessible on-line at http://e-ecodb.bas.bg/rdb/en/vol2/); IUCN – abbreviation of the category in the IUCN Red List of Threatened Species (accessible on-line at http://www.iucnredlist.org/); NP – Natural park "Vrachanski Balkan"; RE – Reserve "Vrachanski Karst"; SCI – Sites of Community Importance (Natura 2000 network).

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Херпетофауната (Amphibia & Reptilia) на Врачанска Планина – Видов състав, разпространение и опазване

БОРИСЛАВ НАУМОВ, НИКОЛАЙ ЦАНКОВ, КРАСИМИР ДОНЧЕВ, БОЯН ПЕТРОВ, АНДРЕЙ СТОЯНОВ, ГЕОРГИ ПОПГЕОРГИЕВ, ИВЕЛИН МОЛЛОВ, ВЛАДИМИР БЕШКОВ

(Резюме)

Врачанска планина се намира в Северозападна България и представлява сравнително добре обособен дял от Стара планина. Досега не са публикувани цялостни проучвания върху видовия състав и разпространението на херпетофауната на Врачанска планина.

В резултат на настоящата работа са установени 8 нови за планината земноводни и влечуги, и са потвърдени вече известните 19 вида. Находищата на отделните видове са картирани в UTM-мрежа с резолюция 1 × 1 km. Направен е анализ на хоризонталното и вертикалното разпространение, както и на видовото богатство. Коментирано е значението на съществуващите във Врачанска планина защитени територии и защитени зони от мрежата Натура 2000 за опазването на херпетофауната. Посочени са някои потенциални заплахи за земноводните и влечугите в изследвания район – пресъхване на водоеми, пожари и смъртност по пътищата.

Bechev, D. & Georgiev, D. (Eds.),
Faunistic diversity of Vrachanski Balkan Nature Park.
ZooNotes, Supplement 3, Plovdiv University Press,
Plovdiv, 2016

Birds of Vrachanski Balkan Nature Park

GEORGI STOYANOV, KRASIMIR DONCHEV

Abstract. The work is based mainly on personal field studies of the authors during different periods of time from the beginning of the 1980s until present. As a result, the Park's species list is extended to 208 bird species, 131 of them nesting in the mountain. We report 23 species for the first time for the Park's area. Analyses of proportion of species distribution among 13 habitat types revealed several patterns: 1) forest habitats held more species than expected; 2) number of species that nested in 1, 2 or 3 habitats was higher than expected; 3) proportion of species, that nested in 1, 2 or 3 habitats was higher in rock habitats, mountain pastures and running waters, and lower in broadleaf plantations.

Key words: birds, Vrachanski Balkan, species composition, zoogeography, habitats, Bulgaria.

Introduction

There are several ornithological publications for the territory of the mountain Vrachanski Balkan and Vrachanski Balkan Nature Park. Those are the works of Profirov (1988), Milchev & Georgiev (1998), Georgiev & Milchev (2000), Stoyanov & Donchev (2011), and Nankinov (2012). Information about different species in the area, or species from different areas of the Park, can be found in other publications - Simeonov (1962), Donchev (1970), Stoyanov (2002), Stoyanov (2006) etc.

So far there has been no serious attempt at ecological characteristic of the ornitofauna of the Park. Georgiev & Milchev (2000) mention habitat distribution and occurrence correlation of 22 species and 5 types of habitats. Stoyanov & Donchev (2011) are describing 5 bird communities, nesting in different habitats. Both works are mainly descriptive and lack deeper analysis of the species distribution within and among the described habitats.

The main goal of this paper is to make overview on species diversity and to reveal some patterns of species composition from zoogeographic, ecological and conservation point of view.

Materials and methods

Field work. This work is based mainly on personal field studies of the authors during different periods of time from the beginning of the 1980s until present. The field work is carried out according to standard methodologies - field transects and point counts.

We have conducted daytime and nighttime searches, according to characteristics of the different species. For visual observations we used mainly binoculars with magnification and objective diameter 10X50 and fieldscopes 20X60-80. We also searched for pellets, feathers, and other signs of activity. Mist nets are used in some occasions for clarifying species composition of small passerines during migration.

Study area. The Park's territory includes almost whole mountain Vrachanski Balkan, as well as the rock massif Lakatnishki skali. The altitude ranges from approximately 250 m a.s.l. to 1481.8 m a.s.l. (peak Beglichka mogila). The baserock is mostly limestone, with high degree of karstification. As a result the mountain is rich of karst forms and rock complexes, and is relatively dry. There are 37 formations and 124 associations described from the Park's territory. The lower parts of the mountain are ocupied by thermophilous oak formations, while higher parts are covered by beech forests. Widespread are the formations of hornbeam and other xerophytic shrub formations. Grassland has secondary origin and ocupies large portions of the mountain, especially in the highest parts. Other artificial habitats are the coniferous and the broadleaf plantations, the former occupying significant portion of the Park.

Habitat classification

The habitat classification is based on Corine land cover (Commission of the European Communities 1994), adjusted to the specifics of the mountain and the characteristics of the research object (birds). The habitat classification we adopted is as follows:

A. Forests.

1. Broadleaf forests

1.1. Oak forests (A.1.1) - includes all forests and woods in the "oak" belt.

1.2. Beech forests (A.1.2) - includes all forests and woods in the "beech" belt.

2. Coniferous plantations (A.2).

3. Broadleaf plantations (A.3) - mostly *Robinia pseudoacatia*, but also poplar hybrids, and walnut orchards.

4. Riparian woods and bushes (A.4).

B. Bushes and grassland

1. Bushes (B.1) - includes formations of *Carpinus orientalis*, *Paliurus spina-christi* (very restricted), *Crataegus sp.*, *Corylus avellana* etc.

2. Dry grassland (B.2).

3. Mountain pastures (B.3).

4. Mesophilous and hygrophilous grassland (B.4).

C. Artificial landscape (C) - villages, chalets, huts, etc.

D. Rocky habitats (D).

E. Inland surface waters.

1. Standing waters (E.1).

2. Running waters (E.2).

Species composition

The qualitative abundance of the registered species is based on the numbers of pairs (for larger and/or rare nesting birds) or authors subjective evaluation of species encounter frequency. We also considered the distribution of suitable habitat for the species in question on the Park's territory (subjectively evaluated). Species, which are known only from the literature, are not evaluated. We did not include in the list 3 species - *Strix uralensis* Pallas, 1771, *Aegolius funereus* Linnaeus, 1758, and *Sitta neumayer* Michahellis, 1830, mentioned

only by Nankinov (2012), and which were never found before or after that.

We defined the different periods in the life cycle of birds as nesting period (according to the International scale for nesting probability, Simeonov & Michev 1991), migration (including postnatal dispersion and movements of non breeding individuals during breeding season), and wintering (including of species, which stay on the Park's territory the whole year). Species, for which nesting in the Park has not been confirmed in more recent times (e. g. *Aegypius monachus* Linnaeus, 1766, *Aquila heliaca* Savigny, 1809) are not treated as nesting.

Analyses. We used Goodness of fit test for comparing proportions of different zoogeographic types of the birds, nesting in the Park's territory, with the Bulgarian avifauna (Simeonov *et al.* 1990). For the nesting avifauna, Chi-square test was used to compare: proportions of number of species, nesting in different number of habitats (1 to 7), and number of species, nesting in different habitats (13 habitats) with the total number of species, nesting in the Park; number of very rare (VR) and rare (R) species (pooled together) with the number of common (C) and very common (VC) species (pooled together) in different habitats, and number of species with higher conservation value (included in Red data book of Bulgaria and/or Appendix 2 of Biodiversity Law) with the rest of the species in different habitats. Species, which no longer nest in the Park, as well as species, which nest in the Park's periphery, are not included in the analyses.

For the statistical analyses we used Minitab 16.1.1, Minitab Inc., 2010 (Trial version).

Results

Species composition

We registered a total of 208 bird species for the territory of Vrachanski Balkan Nature Park. This is approximately 51% of the ornitofauna of Bulgaria (BUNARCO 2009). Among them 131 species (54% of the regularly nesting birds in Bulgaria, *ibid.*) are nesting on the Park's territory (three species are treated as no longer nesting - *Neophron percnopterus* Linnaeus, 1766, *Falco cherrug* Gray, 1834, and *Coracias garrulus* Linnaeus, 1758). 54 species were registered only during seasonal migrations, or as incidental visitors, and three species are registered only during winter (*Anser anser* Linnaeus, 1758, *Anser albifrons* Scopoli, 1769, and *Falco cherrug*). Twenty three species were newly recorded for the Park's area. Most of them are very rare migrants, but 3 species are registered during the breeding season. Species composition, species relative abundance during the three life cycle periods, and their conservation status are given in Appendix 1.

Zoogeography of nesting ornitofauna

Nesting ornitofauna of the Park belongs to 12 zoogeographical types (Tabl. 1). Most numerous are Palearctic species (38%), followed by species of European and European - Turkestanian origin (14%). There was no significant difference between the proportions of different types from the Park and the country as a whole (n = 123, DF = 11, Chi-Sq = 12.3247, P-Value = 0.340; Fig. 1).

Table 1. Number of species, belonging to different zoogeographical categories in the Park's territory (VBNP) and Bulgaria (BG).

Zoogeographical type	Abbreviation	VBNP	BG
Cosmopolitan	COS	2	12
European	EUR	17	24
European-turkestanian	ET	17	23
Holarctic	HOL	12	23
Indo-african	IA	3	10
Mediterranean	MED	7	14
Old world	OW	6	18
Palearctic	PAL	47	81
Paleomontane	PAM	4	6
Paleoxeric	PAX	1	5
Paleoxero-montane	PXM	3	4
Turkestano-mediterranean	TM	4	14

Nesting species and habitats

On the Park's territory, forest habitats are richest of species. 54 to 35 species nest in the different type of forests, with lowest number established for broadleaf plantations (Tabl. 2). They are followed by bush (35 species) and rocky habitats (32 species). Low number of nesting species was established for water habitats (2 species connected with stagnant water and 7 - with rivers), which correspond with the small area of those habitats in the Park's territory. Those observations are supported by the results of Chi-Square test (Chi-Sq = 100.071, DF = 12, P-Value < 0.05), with observed values for oak forests (A.1.1), beech forests (A.1.2), coniferous plantations (A.2) and riparian woods (A.4) higher, and those for mountain pastures (B.3), mesophile grassland (B.4), standing (E.1) and running waters (E.2) lower than expected.

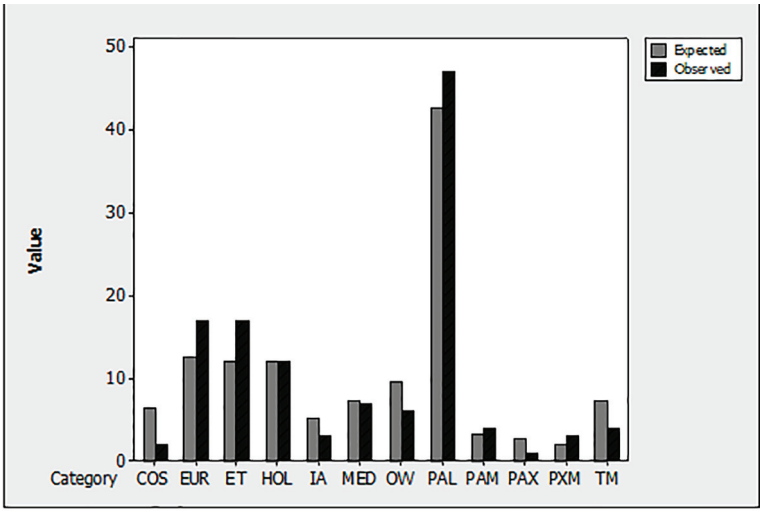

Fig. 1. Chart of observed and expected values of zoogeographical types in Vrachanski Balkan Nature Park, Goodness of fit test. Abbreviations as in Table 1.

Table 2. Birds, nesting in different habitat types in Vrachanski Balkan Nature Park.

№	Species	A.1.1	A.1.2	A.2	A.3	A.4	B.1	B.2	B.3	B.4	C	D	E.1	E.2
1	*C. nigra*	+										+		
2	*G. fulvus*											+		
3	*A. gentilis*	+	+	+	+									
4	*A. nisus*	+	+	+	+									
5	*P. apivorus*	+	+	+	+									
6	*B. buteo*	+	+	+	+	+								
7	*B. rufinus*											+		
8	*A. pomarina*	+	+											
9	*A. chrysaetos*											+		
10	*C. gallicus*	+	+	+	+									
11	*F. tinnunculus*											+		
12	*F. subbuteo*	+	+	+	+	+								
13	*F. peregrinus*											+		
14	*C. coturnix*							+		+				
15	*P. colchicus*					+	+			+				
16	*A. graeca*						+	+	+			+		
17	*P. perdix*					+	+	+		+				
18	*G. chloropus*												+	+
19	*C. crex*								+	+				
20	*C. dubius*													+
21	*A. hypoleucos*													+
22	*C. oenas*	+	+											
23	*C. palumbus*	+	+	+	+	+								
24	*C. livia*											+		
25	*S. turtur*	+			+	+								
26	*C. canorus*	+	+	+	+	+	+							
27	*C. europaeus*	+					+							
28	*O. scops*	+	+			+								
29	*B. bubo*											+		
30	*A. noctua*										+	+		
31	*S. aluco*	+	+	+		+						+		
32	*A. otus*	+	+	+	+	+								
33	*A. apus*										+			
34	*A. melba*											+		
35	*A. atthis*													+
36	*M. apiaster*							+						
37	*U. epops*	+			+	+						+		
38	*J. torquilla*	+	+	+	+	+								
39	*D. martius*	+	+	+	+	+								
40	*P. viridis*	+	+	+	+	+					+			
41	*P. canus*	+	+			+								
42	*P. minor*	+	+	+	+	+					+			
43	*P. leucotos*		+											

№	Species	A.1.1	A.1.2	A.2	A.3	A.4	B.1	B.2	B.3	B.4	C	D	E.1	E.2
44	*P. medius*	+	+			+								
45	*P. major*	+	+	+	+	+					+			
46	*P. syriacus*	+	+	+	+	+					+			
47	*E. alpestris*								+					
48	*L. arborea*						+	+	+	+				
49	*A. arvensis*							+	+	+				
50	*H. rupestris*										+	+		
51	*H. rustica*										+	+		
52	*H. daurica*										+	+		
53	*D. urbica*										+	+		
54	*M. cinerea*											+		+
55	*M. alba*										+	+	+	+
56	*A. trivialis*						+	+	+	+				
57	*A. spinoletta*								+	+				
58	*L. collurio*				+	+	+	+	+	+	+			
59	*L. minor*				+	+	+	+						
60	*L. senator*						+	+						
61	*C. cinclus*											+		+
62	*T. troglodytes*	+	+	+										
63	*P. collaris*								+	+		+		
64	*P. modularis*			+			+		+					
65	*E. rubecula*	+	+	+	+	+								
66	*E. luscinia*					+								
67	*E. megarhynchos*					+	+							
68	*P. ochruros*										+	+		
69	*P. phoenicurus*	+				+	+	+			+			
70	*S. rubetra*						+	+	+					
71	*S. torquata*						+	+	+					
72	*O. oenanthe*							+	+			+		
73	*O. hispanica*						+	+				+		
74	*M. saxatilis*								+			+		
75	*T. merula*	+	+	+	+	+	+				+			
76	*T. philomelos*	+	+	+	+	+								
77	*T. viscivorus*		+	+										
78	*H. icterina*	+				+	+							
79	*H. pallida*	+				+	+							
80	*S. nisoria*					+	+	+						
81	*S. borin*	+					+							
82	*S. atricapilla*	+	+			+								
83	*S. communis*	+				+	+	+						
84	*S. curruca*	+				+	+							
85	*R. regulus*			+										
86	*R. ignicapillus*			+										
87	*P. collybita*	+	+	+										
88	*P. sibilatrix*		+	+										

№	Species	A.1.1	A.1.2	A.2	A.3	A.4	B.1	B.2	B.3	B.4	C	D	E.1	E.2
89	*F. semitorquata*		+			+								
90	*F. parva*		+											
91	*M. striata*	+	+			+					+			
92	*A. caudatus*	+				+	+							
93	*P. palustris*	+	+			+								
94	*P. lugubris*	+	+			+								
95	*Parus montanus*		+	+										
96	*P. ater*			+										
97	*Parus major*	+	+	+	+	+	+				+			
98	*P. caeruleus*	+	+	+	+	+	+				+			
99	*S. europaea*	+	+	+		+								
100	*T. muraria*											+		
101	*C. familiaris*	+	+	+		+								
102	*E. citrinella*	+	+	+			+	+	+					
103	*E. cirlus*				+		+	+						
104	*E. hortulana*	+			+		+	+						
105	*E. calandra*						+	+	+					
106	*E. cia*						+	+				+		
107	*F. coelebs*	+	+	+	+	+					+			
108	*S. serinus*			+										
109	*C. chloris*	+	+	+	+	+	+				+			
110	*C. carduelis*	+			+	+	+				+			
111	*A. cannabina*						+	+	+					
112	*L. curvirostra*			+										
113	*P. pyrrhula*		+	+										
114	*C. coccothraustes*	+	+	+	+	+								
115	*S. vulgaris*	+	+		+	+					+			
116	*O. oriolus*	+			+	+								
117	*P. domesticus*										+	+		
118	*P. montanus*				+	+	+				+	+		
119	*G. glandarius*	+	+	+	+	+								
120	*N. caryocatactes*			+										
121	*P. graculus*											+		
122	*Corvus monedula*										+	+		
123	*C. corone*		+	+	+	+								
124	*C. corax*			+								+		
	TOTAL	**54**	**48**	**43**	**35**	**51**	**35**	**23**	**17**	**10**	**25**	**32**	**2**	**7**

There was significant difference in the proportion of number of species, nesting in different number of habitats (Chi-Sq = 26.665, DF = 6, P-Value < 0.05). Observed values for species, nesting in only one, two or three habitats (25, 28 and 27 species respectively) were higher, and those for species, nesting in 6 or 7 habitats (7 and 5 species) were lower than expected. In order to establish which habitats are important for the “specialized” species (those nesting in 1, 2 and 3 habitats), we performed another Chi-Square test for difference in proportions between those species and the rest of the species, nesting in the different

habitats. The standing waters (E.1) were omitted from the test because of small sample size. The difference was significant (Chi-Sq = 60.671, DF = 11, P-Value < 0.05), with higher than expected observed values for "specialized" species in mountain pastures (B.3), rocky habitats (D), and running waters (E.2), and lower for broadleaf plantations (Fig. 2). The most significant contribution to the Chi-Square value is attributable to the "specialized" species in rocky habitats (Fig. 3).

In order to eliminate probable bias, caused by difference in species proportion in different habitats, we tested the distribution pattern of very rare (34 species) and rare (27 species) nesting species separately for forest habitats (A.1.1, A.1.2, A.2, A.4), "dry" habitats (A.3, B.1, B.2, C, D), and "wet" habitats (B.3, B.4, E.2). There was no significant difference in the proportion of rare birds (very rare and rare pooled together) and common birds (common and very common pooled together) in the different habitats (P-Value > 0.05 for all of the three groups).

There was also no significant difference in the proportions of species with higher conservation value and the rest of the nesting species (Chi-Sq = 9.387, DF = 11, P-Value = 0.586).

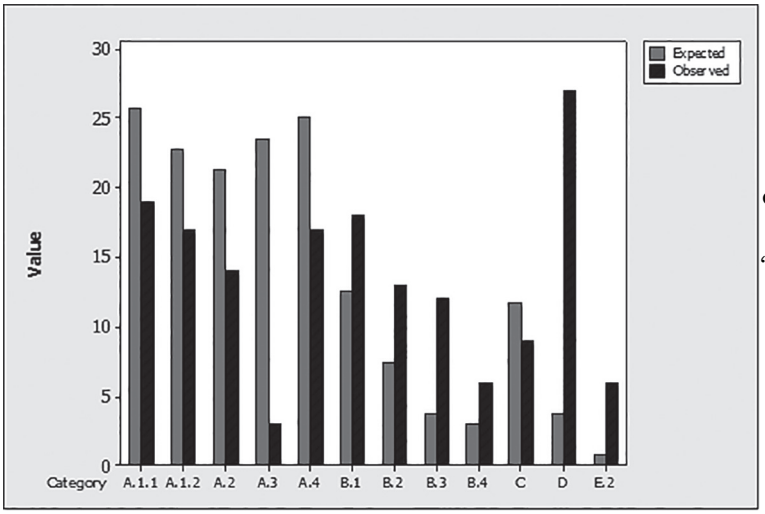

Fig. 2. Chart of observed and expected values of number of "specialized" species in different habitats.

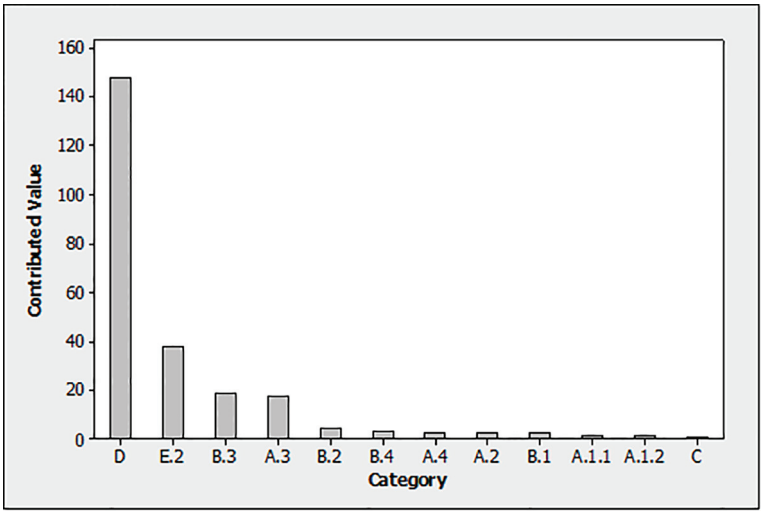

Fig. 3. Chart of Contribution to the Chi-Square value by category.

Discussion

With half of the Bulgarian bird species registered on the Park's territory, and more than half nesting within its borders, Vrachanski Balkan could be described as very rich regarding the ornitofauna. This is reflected by the designation of the site as Important Bird Area (Stoyanov *et al.* 2007). For comparison, Ponor mountain, which is also Important Bird Area, and is very similar regarding the geology and habitats, holds 120 nesting bird species (Dyulgerova & Nikolov 2014). As our results demonstrate, the number of species, registered in Vrachanski Balkan, keeps growing. This fact is based mostly on observations of migrating birds, which are still not studied in detail. We expect that systematic observations of seasonal migration will reveal that more species use the Park's territory during that stage of their lifecycle, for rest and/or feeding. The presence of *Nucifraga caryocatactes* (Linnaeus, 1758) is connected with the considerable area of coniferous plantations (about 6% of the Park's territory; Veseslinov & Matev 2011), some of which are created 50 - 60 years ago (*ibid.*). Their long existence leads to "naturalization" of those habitats, which is reflected by the relatively high number of species, nesting in them, as demonstrated by our results. The registration of *Apus pallidus* (Shelley, 1870) is in accordance with the well documented and explained expansion of the species areal northwards (Moreno-Rueda 2009, Nankinov *et al.* 1997, Tietze *et al.* 2015). *Erithacus luscinia* (Linnaeus, 1758) is a rare breeder in Bulgaria (Nankinov 2009). Its discovery in the Vrachanski Balkan Nature Park shows the importance of long term field research for more objective and complete conception for the ornitofauna of certain area, especially as large as the Park's territory.

In 2014 two pairs of *Gyps fulvus* (Hablizl, 1783), from a flock, released on implementation of project for the reintroduction of the species in Stara planina (Green Balkans Federation 2010), nested near the site of reintroduction. This is the first confirmed breeding of the species after its disappearance since the middle of 20th century.

Unfortunately, along with the three newly registered nesting species, during the last couple of decades three species ceased to breed in the mountain. While *Coracias garrulus* has never been typical for the Park's territory and its disappearance is probably connected with changes in the surrounding, agricultural areas, the disappearance of *Neophron percnopterus* and *Falco cherrug* is due to factors on national and international levels (Kurtev *et al.* 2008, Ragyov *et al.* 2009, Ragyov *et al.* 2014, Skartsi et al. 2014). Our last observation of the Saker falcon during breeding season in the Park's territory is in 1998 (hunting pair), and the last nesting pair of the Egyptian vulture disappeared in 2009.

The zoogeographic characteristic of the Park's ornitofauna shows no differences in the proportions of the different types from those in the country as a whole. The result is consistent with the conclusion of Boev *et al.* (2007) of high homogeneity of the Bulgarian ornitofauna from zoogeographical point of view.

The results for the number of nesting species in the different habitats is also not surprising. Among terrestrial habitats, forests are richer of biodiversity as a rule, especially compared to open, grassland habitats (as in our results), and the fact that they occupy almost 1/3 of the Park's territory explains very well the higher proportion of nesting birds. The exception is the broadleaf plantations (mainly *Robinia pseudoacatia*), which have been known for their poor biodiversity, and our results prove this at least for the Park's territory. Lower diversity of birds in water habitats is explained by the very small area they are occupying within the mountain. Regardless of this low diversity, the proportion

of "specialized" species was higher in water habitats (running water only) and mountain pastures, which underlines their importance for the conservation of such vulnerable species. The highest proportion of "specialized" species was obtained for rock habitats, which are very important for the Park's ornitofauna.

There was no difference in the proportion of species, classified by us as very rare or rare for the mountain, and the rest of the species from the different habitats. No such difference was found when comparing species with higher conservation value. We have classified 34 species as very rare, and 27 as rare. The relative abundance of part of them is low simply because of small area of suitable habitat (e.g. aquatic birds) or other unfavorable conditions (e.g. lowland birds), or because the mountain is at the border of their areal (some passerines). However, for some of them we have observed a tendency towards decreasing of their abundance in at least the 2 last decades. According to our data, some of the factors, that are responsible for this are: logging, which damages, sometime destroys large areas of forest habitats, can destroy nests, eggs and nestlings, when done in the breeding season, and disturbs the birds in the vicinity of the work; direct persecution - illegal hunting, including with traps, and nest robbing of birds of prey; disturbance by treasure hunters, off-road driving and other extreme sports; electrocution by low-voltage power lines.

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Appendix 1: Species composition of ornitofauna of Vrachanski Balkan Nature Park.

№	*Species*	1	2	3	BDL	RDB	IUCN	CITES	CMS
1	*Phalacrocorax carbo*		C	VC			NE		
2	*Nycticorax nycticorax*		VR		2,3	VU			
3	***Ixobrychus minutus***		VR		2,3	EN			II
4	*Egretta garzetta*		L		2,3	VU			
5	*Egretta alba*		R	VR	2,3	CR			II
6	*Ardea cinerea*		C	C	3	VU			
7	*Ardea purpurea*		VR		2,3	EN			II
8	*Ciconia nigra*	C	C		2,3	VU		II	II
9	*Ciconia ciconia**	VR	R		2,3	VU			II
10	***Cygnus olor***		VR	VR	3	VU			II
11	*Anser anser*			VR	3	EN			II
12	*Anser albifrons*			VR					II
13	*Anas platyrhynchos**	R	C	C					II
14	*Anas querquedula*		VR			VU			II
15	*Anas crecca*		VR	VR					II
16	*Anas penelope*		VR	VR					II
17	*Neophron percnopterus***		VR		2,3	EN	EN	II	II
18	*Gyps fulvus****	VR	R	R	2,3	EN		II	II
19	*Aegypius monachus*		VR		2,3	EX	NT	II	II
20	***Milvus milvus***		VR		2,3	CR	NT	II	II
21	*Milvus migrans*		VR		2,3	VU		II	II
22	*Circus aeruginosus*		R		2,3	EN		II	II
23	*Circus cyaneus*		R	VR	2,3	CR		II	II
24	*Circus pygargus*		VR		2,3	VU		II	II
25	*Circus macrourus*		VR		2,3	EX	NT	II	II
26	*Accipiter gentilis*	R	R	R	3	EN		II	II

№	*Species*	1	2	3	BDL	RDB	IUCN	CITES	CMS
27	*Accipiter nisus*	R	C	C	3	EN		II	II
28	*Accipiter brevipes*		VR		2,3	VU		II	II
29	*Pernis apivorus*	C	C		2,3	VU		II	II
30	*Buteo buteo*	VC	VC	C	3			II	II
31	*Buteo rufinus*	C	R	VR	2,3	VU		II	II
32	*Buteo lagopus*		VR	VR	3			II	II
33	*Aquila pomarina*	VR	VR		2,3	VU		II	II
34	***Aquila clanga***		VR		2,3	CR	VU	II	I
35	*Aquila chrysaetos*	R	R	R	2,3	VU		II	II
36	*Aquila heliaca*		VR		2,3	CR	VU	II	I
37	***Haliaeetus albicilla***		VR	VR	2,3	VU		I	I
38	*Hieraaetus pennatus*		VR		2,3	VU		II	II
39	*Circaetus gallicus*	R	R		2,3	VU		II	II
40	*Pandion haliaetus*		VR		2,3	CR		II	II
41	*Falco tinnunculus*	C	VC	R	3			II	II
42	***Falco naumanni***		VR		2,3	CR		II	I
43	***Falco vespertinus***		VR		2,3	CR	NT	II	II
44	*Falco columbarius*		VR	VR	2,3			II	II
45	*Falco subbuteo*	R	R		3	VU		II	II
46	*Falco peregrinus*	C	C	R	2,3	EN		I	II
47	*Falco cherrug***			VR	2,3	CR	EN	II	II
48	*Falco biarmicus*		L		2,3	CR		II	II
49	*Coturnix coturnix*	C	C						II
50	*Phasianus colchicus torquatus****	VR	VR	VR					
51	***Bonasa bonasia***		VR		2,3				
52	*Alectoris graeca*	R		VR	2	EN	NT		
53	*Perdix perdix*	VR	VR	VR					
54	*Grus grus*		VR		2,3	EX		II	II
55	*Fulica atra*		VR						
56	*Gallinula chloropus*	VR	VR						
57	*Crex crex*	C	C		2,3	VU			II
58	***Burhinus oedicnemus***		VR		2,3	VU			II
59	*Vanellus vanellus*		R		3				II
60	***Pluvialis squatarola***		VR		3				II
61	*Eudromias morinellus*		L		2,3				II
62	*Charadrius dubius*	R	R		3	VU			II
63	*Tringa ochropus*		VR		3	EN			II
64	*Tringa glareola*		VR		2,3				II
65	*Actitis hypoleucos*	VR	R		3				II
66	*Scolopax rusticola*		C			EN			II
67	***Gallinago media***		VR		2,3		NT		II
68	*Gallinago gallinago*		VR			CR			II
69	***Philomachus pugnax***		VR		2,3				II
70	***Larus cachinnans***		VR	VR					
71	*Larus ridibundus*		R	R	3	EN			

№	*Species*	1	2	3	BDL	RDB	IUCN	CITES	CMS
72	*Columba oenas*	VR	VR	VR	3	EN			
73	*Columba palumbus*	VC	C	R					
74	*Columba livia*	VR	VR	VR	3	EN			
75	*Streptopelia turtur*	R	C						II
76	*Streptopelia decaocto**	VR	VR	VR					
77	*Cuculus canorus*	VC	C		3				
78	*Caprimulgus europaeus*	C			2,3				
79	*Otus scops*	VC	VC		3			II	
80	*Bubo bubo*	VC	R	R	2,3	EN		II	
81	*Athene noctua*	C	C	R	3			II	
82	*Strix aluco*	VC	C	R	3			II	
83	*Asio otus*	C	R		3			II	
84	***Asio flammeus***		VR		2,3			II	
85	*Apus apus*	R	C		3				
86	***Apus pallidus****	VR	R		3				
87	*Apus melba*	VC	C		3				
88	*Alcedo atthis*	R	R	VR	2,3				
89	*Merops apiaster*	VR	VC						II
90	*Coracias garrulus***		VR		2,3	VU	NT		II
91	*Upupa epops*	C	C		3				
92	*Jynx torquilla*	C	C		3				
93	*Dryocopus martius*	C	C	C	2,3	VU			
94	*Picus viridis*	VC	C	C	3				
95	*Picus canus*	R	R	R	2,3	EN			
96	*Picoides minor*	R	R	R	3				
97	*Picoides leucotos*	VR	VR	VR	2,3	EN			
98	*Picoides medius*	R	R	R	2,3				
99	*Picoides major*	VC	VC	C	3				
100	*Picoides syriacus*	VC	C	C	2,3				
101	*Melanocorypha calandra*		L		2,3	EN			
102	*Eremophila alpestris*	VR	VR	VR	3	VU			
103	*Calandrella brachydactyla*		L		2,3	VU			
104	*Galerida cristata*		R		3				
105	*Lullula arborea*	VC	VC	VR	2,3				
106	*Alauda arvensis*	VC	C	VR	3				
107	*Riparia riparia*		VR		3				
108	*Hirundo rupestris*	VC	VC		3				
109	*Hirundo rustica*	VC	VC		3				
110	*Hirundo daurica*	VC	VC		3				
111	*Delichon urbica*	VC	VC		3				
112	*Motacilla flava*		C		3				
113	*Motacilla cinerea*	VC	C	C	3				
114	*Motacilla alba*	VC	VC	R	3				
115	*Anthus campestris*		VR		2.3				
116	***Anthus pratensis***		C	VR	3				

№	*Species*	1	2	3	BDL	RDB	IUCN	CITES	CMS
117	*Anthus trivialis*	VC	VC		3				
118	*Anthus spinoletta*	VR	R		3				
119	*Lanius collurio*	VC	C		2,3				
120	*Lanius minor*	R	R		2,3				
121	*Lanius excubitor*		C	R	3	CR			
122	*Lanius senator*	VR	VR		3				
123	*Cinclus cinclus*	C	VC	R	3				
124	*Troglodytes troglodytes*	C	C	R	3				
125	*Prunella collaris*	VR	R	VR	3	VU			
126	*Prunella modularis*	R	VC	VR	3				
127	*Bombycilla garrulus*		VR	VR	3				
128	*Erithacus rubecula*	VC	VC	VR	3				II
129	***Erithacus luscinia***	VR	VR		3				II
130	*Erithacus megarhynchos*	VC	VC		3				II
131	*Phoenicurus ochruros*	VC	VC	VR	3				II
132	*Phoenicurus phoenicurus*	R	R		3	VU			II
133	*Saxicola rubetra*	C	C		3				II
134	*Saxicola torquata*	VR	C		3				II
135	*Oenanthe oenanthe*	C	R		3				II
136	*Oenanthe hispanica*	VR	VR		3				II
137	*Monticola saxatilis*	C	R		3				II
138	*Monticola solitarius*		VR		3	VU			II
139	*Turdus torquatus*		VR		3				II
140	*Turdus merula*	VC	VC	VC	3				II
141	*Turdus pilaris*		VC	VC	3				II
142	***Turdus iliacus***		VR	VR	3				II
143	*Turdus philomelos*	VC	VC	VR	3				II
144	*Turdus viscivorus*	VC	VC	VR	3				II
145	***Locustella fluviatilis***		VR		3	VU			II
146	***Acrocephalus scirpaceus***		VR		3				II
147	***Acrocephalus palustris***		VR		3				II
148	*Acrocephalus arundinaceus**	VR	VR		3				II
149	*Hippolais icterina*	VR	VR		3	VU			II
150	*Hippolais pallida*	VR	VR		3				II
151	*Sylvia nisoria*	R	R		2,3				II
152	*Sylvia borin*	VR	VR		3	EN			II
153	*Sylvia atricapilla*	VC	VC		3				II
154	*Sylvia communis*	VC	VC		3				II
155	*Sylvia curruca*	C	C		3				II
156	*Regulus regulus*	VR	C	C	3				II
157	*Regulus ignicapillus*	VR	C	C	3				II
158	*Phylloscopus trochilus*		C		3				II
159	*Phylloscopus collybita*	VC	VC		3				II
160	*Phylloscopus sibilatrix*	R	C		3				II
161	*Ficedula hypoleuca*		R		3				II

№	Species	1	2	3	BDL	RDB	IUCN	CITES	CMS
162	*Ficedula semitorquata*	C	C		2,3	VU	NT		II
163	*Ficedula albicollis*		C		2,3	CR			II
164	*Ficedula parva*	VR	VR		2,3	VU			II
165	*Muscicapa striata*	R	VC		3				II
166	*Aegithalos caudatus*	VC	VC	C	3				
167	*Parus palustris*	C	C	R	3				
168	*Parus lugubris*	C	C	C	3				
169	*Parus montanus*	VR	VR	VR	3				
170	*Parus ater*	C	C	C	3				
171	*Parus major*	VC	VC	VC	3				
172	*Parus caeruleus*	VC	C	C	3				
173	*Sitta europaea*	VC	VC	C	3				
174	*Tichodroma muraria*	VR	R	R	3	VU			
175	*Certhia familiaris*	R	R	VR	3				
176	*Certhia brachydactyla*		VR		3				
177	*Emberiza citrinella*	VC	VC	R	3				
178	*Emberiza cirlus*	R	R	VR	3				
179	*Emberiza hortulana*	VC	C		2,3				
180	*Emberiza calandra*	VC	VC	R	3				
181	*Emberiza cia*	VC	C	R	3				
182	***Emberiza schoeniclus***		VR		3				
183	*Emberiza melanocephala**	VR	R		3				
184	*Fringilla coelebs*	VC	VC	C	3				
185	*Fringilla montifringilla*		C	VC	3				
186	*Serinus serinus*	R	C	VR	3				
187	*Carduelis chloris*	VC	VC	C	3				
188	*Carduelis spinus*		VC	C	3	VU			
189	*Carduelis carduelis*	VC	VC	C	3				
190	*Acanthis flammea*		L		3				
191	*Acanthis cannabina*	R	C	VR	3				
192	*Loxia curvirostra*	VR	R	R	3				
193	*Pyrrhula pyrrhula*	R	C	C	3				
194	*Coccothraustes coccothraustes*	VC	VC	C	3				
195	*Sturnus roseus*		VR		3	VU			
196	*Sturnus vulgaris*	VC	VC	VR					
197	*Oriolus oriolus*	VC	VC		3				
198	*Passer domesticus*	C	C	R					
199	*Passer hispaniolensis**	VR	VR		3				
200	*Passer montanus*	C	C	R	3				
201	*Garrulus glandarius*	VC	VC	C					
202	*Pica pica**	VR	VR						
203	***Nucifraga caryocatactes***	VR	VR	VR	3				
204	*Pyrrhocorax graculus*	R	R	R	3	VU			
205	*Corvus monedula*	VR	R	VR					
206	*Corvus frugilegus*		VR	VR					

№	*Species*	1	2	3	BDL	RDB	IUCN	CITES	CMS
207	*Corvus corone*	R	C	R					
208	*Corvus corax*	VC	VC	VC	3				

Legend:

1 - species, registered during nesting period/nesting species; 2 - species, registered during migration; 3 - species, registered as wintering.

BDL - species, included in National Biodiversity Law, Appendix 2 and/or 3 respectively.

RDB - species, included in Red Data Book of the Republic of Bulgaria, with the corresponding status (Golemanski 2011).

IUCN - species, included in The IUCN Red List of Threatened Species. Version 2014.3., with the corresponding status (category 'Least Concern' not shown).

CITES - species, included in the respective appendices (I, II) of Convention on International Trade in Endangered Species of Wild Fauna and Flora.

CMS - species, included in the respective appendices (I, II) of Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention).

Ixobrychus minutus - in bold are species, reported for the first time for the Park's ornitofauna.

* - species, nesting in Park's periphery, or near Park's border, but Park's area is part of its breeding territory; ** - species, which currently does not nest in the Park; *** - introduced/reintroduced species.

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Птиците на Природен Парк Врачански Балкан

ГЕОРГИ СТОЯНОВ, КРАСИМИР ДОНЧЕВ

(Резюме)

Разработката е базирана основно на лични теренни изследвания на авторите през различни периоди от време от началото на 80-те до днес. В резултата, списъка на птиците, установени в границите на Парка е увеличен на 208 вида, като от тях 131 са гнездящи. Новоустановените видове са двадесет и три. Анализа на пропорциите на броя на видовете, гнездящи в 13 различни типа хабитати, разкри няколко закономерности: 1) повече видове гнездят в горските хабитати; 2) броя на видовете, гнездящи само в 1, 2 или 3 хабитата е по-висок от очакваното; 3) пропорцията на видовете, гнездящи в 1, 2 или 3 хабитата е по-висока в скалните хабитати, в планинските пасища и в течащите води, и е по-ниска в широколистните култури.

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Species composition and conservation of small mammals (Mammalia: Erinaceomorpha, Soricomorpha, Lagomorpha, Rodentia) in Vrachanska Planina Mountains

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Abstract. A review on the composition of the small mammals in Vrachanska Planina Mts. was completed using published and author's data. A total of 27 species occur within the territory. All of the species found are typical for the region. The species with the highest conservation status, the European ground squirrel Spermophilus citellus, disappeared from the region in the early 1950s. In the last years activities on its recovery were carried out. We analyze the threats for the small mammals and propose conservation activities to improve their conservation status.

Key words: Micromammalia, threats, conservation, checklist, Spermophilus citellus, Bulgaria.

Introduction

The Vrachanska Planina Mts. is situated between the Fore-Balkan and the main Balkan ridge. Within its territory there are several protected areas with different designation – Natural Park (NP) Vrachanski Balkan, Nature Reserve Vrachanski Karst, 4 protected sites and 5 natural monuments (mainly caves). Vrachanska Planina Mountain partially overlaps with Special Protection Area (SPA) "Vrachanski Balkan" BG0002053, which is included in EU Directive 79/409 (Birds) and the Special Area of Conservation (SAC) "Vrachanski Balkan" BG0000166 of Directive 92/43 (Habitats).

The information about small mammals in the region of Vrachanska Planina Mts., NW Bulgaria, is scarce or outdated. Data can be found in faunistic (Markov 1968) or taxonomic (Peshev 1969, Belcheva et al. 1987, Belcheva & Kolevska 1992) publications. Data is also found in publications about the diet of owls (Simeonov 1968, Baumgart et al. 1973,

Simeonov 1981) and birds of prey (Stoyanov & Boev 2009).

During the last decade, projects were conducted on mapping the distribution of rare mammal species and the implementation of management plans of the protected areas within the study site. Data on species composition and distribution of small mammals in Vrachanski Balkan NP was published by Atanasov et al. (2001) and Zidarova (2007). Data for the small mammals from the adjacent SPA BG0002005 "Ponor" was presented by Koshev (2014).

Here, we summarize the latest available data about small mammals in Vrachanska Planina Mts. and its surroundings. This paper is based on literature data and personal observations and is aimed on analyzes of the threats for the small mammals.

Materials and Methods

To collect data about small mammals in the field we used two methods – the transect method and data from the diet of owls and birds of prey. Using the transect method (Lovari & Rolando 2004) we found accidentally killed animals and species with diurnal activity that could be observed directly or could be determined through the traces they left behind.

In the summer of 2015 we conducted field surveys and searched for potential nesting or resting places of owls. Pellets were collected only from a Little owl (Athene noctua) from Stoyanovo village.

In 2013 under the project "Implementation of activities for the planning and management of NP "Vrachanski Balkan" within the Operational Programme" Environment 2007-2013" provide for reintroduction of the European ground squirrel (*Spermophilus citellus*) in the area of NP "Vrachanski Balkan".

Results and Discussion

A total 27 species of small mammals were identified in Vrachanska Planina Mts. (Table 1). Their conservation status is as follows:

- Biodiversity Act, Appendix 2, Appendix 3: 4 species;
- Red Data Book (2011), VU: 1 species;
- Bern convention, Appendix 2: 1 species, Appendix 3: 12 species;
- IUCN, VU: 1, LC: 25, DD: 1 species;
- Directive 92/43, Appendix 2 and 3: 1 species, Appendix 4: 2 species.

Erinaceomorpha

Erinaceidae

The Eastern hedgehog (*Erinaceus roumanicus* Barett-Hamilton, 1900) is a common species within the study region. Markov (1968) reported this species as quite common in the vicinity of Vratsa town. It has been found in the diet of the Eagle owl nearby Gara Cherepish (Baumgart et al. 1973).

Table 1. Conservation status of small mammals were identified in Vrachanska Planina Mts..

No	Latin name	Biodiversity Act 2002	Directive 92/43	Bern Convention	IUCN	RDB	Presence
	ERINACEOMORPHA						
	Erinaceidae						
1	*Erinaceus roumanicus* Barett-Hamilton, 1900	3			LC		FC
	SORICOMORPHA						
	Soricidae						
2	*Sorex araneus* Linnaeus,1758			3	LC		FC
3	*Sorex minutus* Linnaeus,1766			3	LC		FC
4	*Neomys anomalus* Cabrera, 1907			3	LC		FC
5	*Neomys fodiens* Pennant, 1771			3	LC		P/U
6	*Crocidura leucodon* Hermann, 1780			3	LC		FC, C
7	*Crocidura suaveolens* Pallas, 1811			3	LC		FC, C
	Talpidae						
8	*Talpa europaea* Linnaeus, 1758				LC		FC, C
	LAGOMORPHA						
	Leporidae						
9	*Lepus europaeus* Linnaeus, 1758			3	LC		FC, C
	RODENTIA						FC, C
	Sciuridae						FC, C
10	*Sciurus vulgaris* Linnaeus, 1758			3	LC		FC, C
11	*Spermophilus citellus* Linnaeus, 1766	2	2, 3	2	VU	VU	FC, C
	Gliridae						
12	*Glis glis* Linnaeus, 1766			3	LC		FC, C

13	*Muscardinus avellanarius* Linnaeus, 1758	2, 3	4	3	LC	FC, C
14	*Dryomys nitedula* Pallas, 1778	2	4	3	LC	FC, C
	Muridae					
15	*Micromys minutus* Pallas, 1771				LC	P/U
16	*Apodemus agrarius* Pallas, 1771				LC	FC, C
17	*Apodemus flavicollis* Melchior, 1834				LC	FC, C
18	*Apodemus sylvaticus* Linnaeus, 1758				LC	FC, C
19	*Rattus norvegicus* Berkenhout, 1769				LC	FC, C
20	*Rattus rattus* Linnaeus, 1758				LC	FC, C
21	*Mus musculus* Linnaeus, 1758				LC	FC, C
	Arvicolidae					
22	*Clethrionomys glareolus* Shcreber, 1780				LC	FC, C
23	*Arvicola terrestris* Linnaeus, 1758				LC	FC, C
24	*Microtus* ex. gr. *arvalis*				LC	FC, C
25	*Microtus subterraneus* de Selys-Longchamps, 1836				LC	FC, C
26	*Chionomys nivalis* Martins, 1842			3	LC	FC, C
	Spalacidae					FC, C
27	*Spalax leucodon* Nordmann, 1840				DD	FC, C

Legend:

Biodiversity Act 2002 – Biodiversity Protection Act (State Gazette, No.77 from 9 August 2002), Appendix 2 and Appendix 3 – protected species on the territory of Bulgaria.

Directive 92/43/EU – Recommendation No.43 on the conservation of threatened mammals in Europe (1995) and its Amendment (1996) adopted by the Standing Committee of Council of Europe; Annex II – species whose conservation requires the designation of special areas of conservation, Annex IV – species of community interest in need of strict protection;

Bern Convention – Convention on the conservation of European wildlife and natural habitats, adopted by the Council of Europe in 1998: Appendix II – strictly protected fauna species, Appendix III – protected species;

IUCN – The 2013 IUCN Red List of Threatened Species (IUCN 2013); **Categories:** (VU) – Vulnerable; (LC) – Least Concern; (DD) – Data Deficient

RDB (Red Data Book of Bulgaria, Vol. 2 Animals, Golemansky 2011) **Categories**: (VU) – Vulnerable; (NT) – NearThreatened; (LC) – Least Concern

Presence – found with certainty (FC) constant (C)/temporary (T)/accidental (A); probable (P)/unproven (U) (there are favorable conditions, but the species was not found in studies). Data found with certainty are based on literature review or this study.

Soricomorpha

Talpidae

The European mole (*Talpa europea* Linnaeus, 1758) inhabits various habitats – mainly wet grasslands – meadows, pastures, but also gardens and forest edges. It is most active in the summer and autumn (Markov, 1968). We found molehills from this species in the regions of Zgorigrad village, Ledenika cave, Parshevitsa hut, Lokvata, Milanovo village, Okolchitsa peak. It has been found in the vicinity of Parshevitsa hut, Uchitelski koloni, Milanovo and Ochin villages (Atanasov *et al.* 2001, Zidarova 2007).

Soricidae

The shrews are represented by 6 species (7 species total in Bulgaria). The Common (S*orex araneus* Linnaeus, 1758) and Pygmy shrews (*S. minutus* Linnaeus, 1766) are typical inhabitants of mountains. Markov (1968) reported the Common shrew for Vratsa region. We presume, on the basis of the existing habitats, the presence of the Pygmy shrew as well.

The presence of the two water shrews (Neomys) – the Eurasian water shrew (*N. fodiens* Pennant, 1771) and Miller's water shrew (*N. anomalus* Cabrera, 1907), are likely. Markov (1968) reported both species from the western part of the Balkan mountain. The Eurasian water shrew prefers clear mountain streams and small rivers; while the Miller's water shrew is not so closely tied to water and can live in wet meadows, away from water.

In the lower part of the mountain were found the Bicolored shrew (*Crocidura leucodon* Hermann, 1780) and the Lesser white-toothed shrew (*Cr. suaveolens* Pallas, 1811) (Markov 1968). They inhabit open areas such as abandoned land, hedges, meadows, shrubs, and forests edges. The Bicolored shrew has been found in the diet of the Little owl from Gara Lakatnik (Simeonov 1968). Belcheva & Kolevska (1992) reported the karyotype of this shrew (2n=28) from Lakatnik village.

Lagomorpha

Leporidae

The European hare (*Lepus europaeas* Linnaeus, 1758) is a common species within NP "Vrachanski Balkan" (Zidarova 2007). We found hare traces in the regions of Parshevitsa hut, locality of Lokvata, Dolno Ozirovo village, Stoyanovo village, Zorigrad village. It has been found in the diet of the Eagle owl (Baumgart *et al.* 1973) and the Egyptian vulture (Stoyanov & Boev 2009).

Rodentia

Sciurudae

The two species of the family were represented – the Red squirrel (*Sciurus vulgaris* Linnaeus, 1758) and the European ground squirrel (*Spermophilus citellus* Linnaeus, 1766). The Red squirrel inhabits beech forests, as well as walnut gardens (Markov 1968). It has been found in the diet of the Eagle owl (Baumgart *et al.* 1973).

The European ground squirrel has been widely distributed in the past in Bulgaria – from lowlands to open habitats in high mountain up to 2000 m a.s.l. (Koshev 2008). Markov (1968) reported the species as common in the western Balkan mountain. Preliminary evidence of *S. citellus* at the end of the 1950s there by shepherds-Karakachans area around hut Parshevitsa (G. Stoyanov, unpublished data). Atanasov *et al.* (2001) found only single

specimens in NP "Vrachanski balkan", but after that neither Zidarova (2007) nor the study before reintroduction, confirmed this information.

The project "Implementation of activities for the planning and management of NP "Vrachanski Balkan" within the Operational Programme" Environment 2007-2013" provided means for the reintroduction of *S. citellus*. The project started with the preparation of a plan for reintroduction, using the recent literature sources (Hapl *et al.* 2006, Gedeon *et al.* 2011, Matějů *et al.* 2010, 2012).

Measures were undertaken to improve its habitat and status, specifically through reintroduction of the species. During the project were carried studies and analyses of the environmental conditions and abiotic factors of potential reintroduction sites (e.g. soil types, vegetation, land cover type, intensity of grazing, predators, lack of threatening factors). Colonies from the Danube plain were explored to provide individuals for the reintroduction. The surveys showed that only one colony near Kobilyak village had sufficiently high density to be a donor of individuals. During the study were identified target habitats in the NP in which to place *S. citellus*. Each of the selected sites had to meet all the basic requirements for conditions of habitats, including being previously inhabited by ground squirrels. The survey conducted before the reintroduction did not reveal ground squirrels in the Natural Park.

The location chosen for reintroduction (south of Parshevitsa hut) was prepared in advance by erecting an electric fence and organizing grazing by horses. Special adaptation cages for *S. citellus* were placed, under continuous observation by experts. Artificial holes in which to put individuals were made with a motorized drill. Reintroduction was carried out in the spring and early summer of 2013 and 2014. Prior to release, captured individuals of *S. citellus* from the donor colony were measured; their sex and age were determined and individuals were tagged with transponders. Individuals in poor health, unsuitable conditions or age (too young or old) were not used for the reintroduction. Thus, 91 individuals were selected to be released in NP "Vrachanski Balkan". The number of individuals was further limited by the density of the colony-donor and the extremely unfavourable weather conditions during the adaptation period for animals (Koshev, Arangelov - unpubl. data).

During both years of reintroduction were observed extreme weather values for rainfall (exceeding the respective month's average) and low temperatures during the active period of *S. citellus*. In addition, there was an accumulation of predators (personally unpublished data - G. Stoyanov). The synergistic effect of these negative factors are likely adversely affect the released individuals.

S. citellus successfully survived the first stage of the reintroduction – the establishment and survival of individuals to the new territory in the early days and into hibernation.

Gliridae

Two of the four species of dormice in Bulgaria, are widespread in the country – the Edible Dormouse (*Glis glis* Linnaeus, 1766) and the Forest Dormouse (*Dryomys nitedula* Pallas, 1778). They can be found from the sea level up to high altitudes in the mountains (Peshev *et al.* 2004). Markov (1968) reported the Edible Dormouse from the vicinity (from a walnut garden) of Vratsa town. Remains from this species were found in bat's boxes from Bilichin preslap, also from Sokolskata cave above Lyutadzhik village, Goliamata cave nearby Zgorigrad village, and Ochin dol village (Zidarova 2007). It has been found in the

diet of the Eagle owl (Baumgart *et al.* 1973). Atanasov *et al.* (2001) reported the Forest dormouse in the forest of the NP "Vrachanski Balkan", without specifying an exact location.

The presence of the third dormouse species – the Hazel dormouse (*Muscardinus avellanarius* Linnaeus, 1758) is likely. Markov (1968) reported this species from the Western part of the Balkan mountain.

Muridae

The Wood mice (Apodemus) are one of the most numerous and widespread rodents in Europe and Bulgaria, occurring in various habitats. The Yellow-necked mouse (*Apodemus flavicollis* Melchior, 1834) inhabits the forests in the Western Balkan Mountain (Markov 1968). The lower part of the mountain are inhabited by the Wood mouse (*Apodemus sylvaticus* Linnaeus, 1758), prefering more open habitats than *A. flavicollis* – arable lands, gardens, forest edges (Markov 1968, Atanasov *et al.* 2001).

The Striped field mouse (*Apodemus agrarius* Pallas, 1771) is a mesophyll species, related to wet habitats, but in northern Bulgaria it is one of the dominant species in alfalfa fields, occurring mainly in the lower elevation areas of the country. It has been found nearby Ledenika cave (Zidarova 2007) and Cherepish village (Belcheva *et al.* 1987).

The Harvest mouse (*Micromys minutus* Pallas, 1771), also prefers wet habitats, and is likely to be present in Vrachanska Planina Mts.. In the Balkan Mountain this species distribution goes up to 1200 m a.s.l. (Peshev *et al.* 2004).

In human settlements live some synanthropic species such as the House mouse (*Mus musculus* Linnaeus, 1758), the Brown (*Rattus norvegicus* Berkenhout, 1769) and Black rats (*R. rattus* Linnaeus, 1758). The Brown rat has been one of the predominant species in the diet of an Eagle owl nearby Gara Cherepish (Baumgart *et al.* 1973).

Arvicolidae

The Bank vole (*Clethrionomys glareolus* Shcreber, 1780) is a typical inhabitant of our mountains. This is a dominant species in the beech forest in the Balkan Mountain (Markov *et al.* 1978, Atanasov *et al.* 2001)

In Bulgaria, the *Microtus* genus is represented by two twin species – *Microtus* (s.str.) *arvalis* (Pallas, 1778) and *Microtus* (s.str.) *levis* (Miller, 1908) (*M. rossieameridionalis* Ognev, 1924) (Peshev *et al.* 2004). Their identification is practically impossible solely based on conventional characteristics (e.g. fur color, body and skull size) (Peshev *et al.* 2004), so in this work we use the name *M.* ex gr. *arvalis* for the grey vole. It inhabits open habitats in the natural park – meadows and pastures (Atanasov *et al.* 2001). It was found in the diet of a Little owl from Stoyanovo village, in the diet of Long-eared owl from Skaklia cave (Atanasov *et al.* 2001), also in the diet of the Eurasian Scops owl (Simeonov 1981) and the Egyptian vulture (Stoyanov & Boev 2009).

The European pine vole (*Microtus subterraneus* Selys-Longchamps, 1836) inhabits various deciduous and coniferous forests in our mountain, but it is a rare species in the lower elevations (Peshev *et al.* 2004). Its presence was not confirmed, but it is one of the dominant species in the small mammal community of the beech forest of the Balkan Mountain (Markov *et al.* 1978).

The Water vole (*Arvicola terrestris* Linnaeus, 1758) inhabits river and stream banks. It was found in pellets of a Little owl from Stoyanovo village, and also in the diet of an Eagle owl nearby Gara Cherepich (Baumgart *et al.* 1973).

The Snow vole (*Chionomys nivalis* Martins, 1842) is a typical rock-dwelling species,

which inhabits Bulgarian mountains, mainly in their higher part. This species was found nearby Lakatnik and Cherepish; these locations being among the lowest observations in Bulgaria. There, the species population was in low numbers (Peshev 1969). Recently, this vole was reported from the vicinity of Madzharovo town (Eastern Rhodopes) at an elevation 150–200 m a.s.l. (Nedyalkov 2012).

It has been found in the pellets of a Long-eared owl (*Asio otus*) from "Skaklia cave" (Atanasov *et al.* 2001). A dead specimen of the species was found in the rocky massive above Dolno Ozirovo village (G. Stoyanov, unpubl. record).

Spalacidae

The Lesser Mole rat (*Spalax leucodon* Nordmann, 1840) inhabits open habitats, e.g meadows and pastures (Atanasov *et al.* 2001). The species is welldistributed in the region of Ponor Mountain (Koshev 2014).

Threats for small mammals

Amongst the threats for the populations of small mammals in Vrachanska Planina Mts. we have identified:

- Investment proposals those are likely to damage the habitats of small mammals. All forms of construction (e.g. for ski runs, wind- and solar power parks, hydropower plants, infrastructure objects, power lines) can directly destroy the habitats of small mammals and/or lead to deterioration of the environment.

- Poaching (mostly associated with illegal hunting and illegal logging of wood) can lead to direct destruction of forest habitats and may influence negatively mammal populations, especially through excessive hunting of hare. Currently, within the park territory is situated hunting reserve "Ledenika", where control and prevention of illegal hunting are exercised.

- Incorrect pasture management is a possible threat. Grazing is an essential factor for the proper management of open habitats, changing the direction of the succession processes; however, grazing in forest habitats needs constant monitoring (Koshev 2014).

- Unregulated garbage disposal, which is most often seen near tourist sites and the most visited tourist routes.

- Non-reclaimed tailings and mining areas. Although the mines in the area of the park are not operational anymore, most of the tailings ponds have not yet been reclaimed and pose a potential risk during high levels of rainfall and subsequent flooding.

- Fires caused by human activity. Lighting fires in unsecured locations poses a risk of forest fires and loss of habitats. The Directorate of the Natural park has developing a system for monitoring and early warning of fires, which greatly reduces this risk.

- Unregulated (intensive) traffic of motor vehicles, including SUVs, snowmobiles, motorcycles, ATVs, etc. outside the roads of the national road network, the municipal roads and the specially designated for this purpose forest roads.

- Climate changes has negative impact on hibernating mammals (e.g. *D. nitedula*, *M. avellanarius*, *G.glis* and *S. citellus*) (Inouye *et al.* 2000).

Conservation activities

To promote the long-term preservation of small mammals in the Vrachanska Planina Mts., we propose the following:

All investment proposals related to the building of new road infrastructure,

construction, forest management projects, etc., should be mandatorily assessed for environmental impact and for the compatibility with the goals of the Management plan of NP "Vrachanski Balkan" and Natura 2000 Network of Protected Areas and co-ordinated with scientific institutes and universities.

Enforcement of rights-of-way and limit on the intensive traffic of vehicles and mechanized equipment on pastures, meadows and grassy fields and other locations off the designated roads.

Prohibition of plowing and planting of meadows and pastures and turning them into arable land and permanent crops and changing their permanent use.

Development of environmentally friendly forms of agriculture and livestock breeding.

Stimulating free pasture breeding and mowing, to favor the maintenance and conservation of natural grasslands and meadows.

Preservation of old-growth forests, which maintain the rich diversity of small mammals of conservation importance.

Limiting the transformation of meadows and grasslands into arable lands.

Limiting the construction of forest roads and enforcing the speed limits on the roads.

Provision of dry passageways for small mammals, guiding paths and noise barriers, during the construction of new roads or renovation of old ones.

Continued scientific research in order to establish the species composition of the small mammals and the population characteristics of the species of conservation importance completely.

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Видов състав и консервационен статус на дребните бозайници (Mammalia: Erinaceomorpha, Soricomorpha, Lagomorpha, Rodentia) на Врачанска планина

НЕДКО НЕДЯЛКОВ, ЙОРДАН КОШЕВ

(Резюме)

Обобщени са данните за дребните бозайници на Врачанка планина използвайки литературни и авторски данни. Установени са 27 вида всички са типични за този район на България. Европейският лалугер *Spermophilus citellus,* вид с висок консервационен статус, в миналото широко разпространен, вероятно изчезва през 50-те години на XX век. През последните няколко години се провеждат дейности по неговото възстановяване. Анализират се заплахите за дребните бозайници и се предлагат мерки за тяхното смекчаване.

Bechev, D. & Georgiev, D. (Eds.),
Faunistic diversity of Vrachanski Balkan Nature Park.
ZooNotes, Supplement 3, Plovdiv University Press,
Plovdiv, 2016

The large mammals (Carnivora, Artiodactyla) of Vrachanska Planina Mountains

DILIAN GEORGIEV

Abstract. On the base of published data a list of the large mammals of the mountain is represented including 11 Carnivora species, and 4 Artiodactyla.

Key words: Carnivora, Artiodactyla, Stara Planina Mts., Bulgaria

Results

The list of the large mammals of the area (Table 1) was derived from the literature data (synopses of monographs and documents), and case terrain studies (footprint studies) in 2014.

Table. 1. List of the large mammals of Vrachanska Mts. with their conservation statute.

Species	Conservation statute
Carnivora	
Vulpes vulpes L.	Hunting Act
Canis lupus L.	Biodiverity Act (Annex 2, 4), Hunting Act, Bern Convention (Annex 2), CITES (Annex 2), Directive 92/43/EEC (Annex 4), Bulgarian Red Data Book (Endangered)
Canis aureus L.	Biodiverity Act (Annex 4), Hunting Act, Directive 92/43/EEC (Annex 5)
Meles meles L.	Hunting Act, Bern Convention (Annex 3)
Lutra lutra L.	Biodiverity Act (Annex 2, 3), Bern Convention (Annex 2), CITES (Annex 1), Directive 92/43/EEC (Annex 2, 4), IUCN (Vulnerable), Bulgarian Red Data Book (Endangered)
Mustela putorius L.	Biodiverity Act (Annex 4), Hunting Act, Bern Convention (Annex 3), Directive 92/43/EEC (Annex 5)
Vormela peregusna Guld.	Biodiverity Act (Annex 2, 3), Bern Convention (Annex 2), IUCN (Vulnerable), Bulgarian Red Data Book (Endangered)
Mustela nivalis L.	Biodiverity Act (Annex 3), Bern Convention (Annex 3)

Martes martes L.	Biodiverity Act (Annex 3), Bern Convention (Annex 3), Directive 92/43/EEC (Annex 5), Bulgarian Red Data Book (Endangered)
Martes foina Erxl.	Hunting Act, Bern Convention (Annex 3)
Felis silvestris Schr.	Biodiverity Act (Annex 4), Hunting Act, Bern Convention (Annex 3), Directive 92/43/EEC (Annex 4)
Artiodactyla	
Capreolus capreolus L.	Hunting Act, Bern Convention (Annex 3)
Cervus elaphus L.	Hunting Act, Bern Convention (Annex 3)
Dama dama L.	Hunting Act, Bern Convention (Annex 3)
Sus scrofa L.	Hunting Act

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Едрите бозайници (Carnivora, Artiodactyla) на Врачанска планина

ДИЛЯН ГЕОРГИЕВ

(Резюме)

На база предимно на литературни данни е представен списък на хищниците и копитните в района на Врачанска планина и техния консервационен статус.

Bechev, D. & Georgiev, D. (Eds.),
Faunistic diversity of Vrachanski Balkan Nature Park.
ZooNotes, Supplement 3, Plovdiv University Press,
Plovdiv, 2016

Ecological characteristics of the main river catchments in Vrachanska Planina Mountains

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Abstract. Assessment of the ecological status of river ecosystems of the major watersheds in the Vrachanska Planina Mts. (Leva River, Cherna River and some tributaries) is made. The assessment is carried out by determining the composition and structure of phytobenthos, benthic macroinvertebrate communities and fish. The following indexes are calculated: diatom pollution index IPS, macrozoobenthic Biotic Index and Fish Based Index (BFI), adopted for assessing the ecological status as required by WFD (Directive 60/2000). Additionally, various physical and hydrochemical analyzes are performed. Based on our results the majority of the mountainous zones of the studied rivers is "good" or "high" ecological status. Deteriorated ecological conditions is observed downstream some villages: for Leva River below the village of Zgorigrad and for Cherna River nearby the village of Dolno Ozirovo. This is probably owing to contamination with organic matter from the human settlements in the area. An accident pollution (with a predominantly protein character) was found in the Cherna River near the Lupovaka area.

Key words: macrozoobenthos, fish, diatoms, ecological status, biotic indices, Bulgaria.

Introduction

The anthropogenic impact on the river ecosystems on the territory of the Vrachanski Balkan Nature Park has not been studied until 2013. We assume that there is a high probability of contamination in the major river catchments (Leva River and Cherna River), owing to the several villages without sewage systems, an abandoned pit mine "Mir", a dairy establishment and livestock farming. In addition, the typology of the studied rivers (semi-mountainous and mountainous types) has a number of specific features, such as a strong karst influence and presence of specific bottom substrata (bedrock, calcareous, rocks, etc.). The objective of this work is to present data for the actual ecological state of the river ecosystems assessed using selected biological and water chemistry indicators, in accordance with the Water legislation in Bulgaria (Regulation N-4) as well as to identify biological reference conditions in very calcareous rivers in Bulgaria.

Material and Methods

Study sites

The study was carried out in July 2013 at 12 sampling sites. They are located along the Leva River catchment (sites 1 – 3, 9 and 10) and Cherna River catchment (sites 4 – 8,

11, and 12) as follows: 1. Dyasna River - upstream the mine "Mir"; 2. Leva River - upstream the village of Zgorigrad; 3. Leva River - downstream the village of Zgorigrad; 4. Gluharska River – upstream; 5. Gluharska river – downstream; 6. Cherna River - downstream the village of Lyutadzhik; 7. Cherna River - upstream the village of Gorno Ozirovo; 8. Cherna River near the village of Dolno Ozirovo; 9. Dyasna River - downstream mine "Mir"; 10. Dyasna River - upstream of the inflow into Leva River; 11. Cherna River - near "Tarsov val" area; 12. Cherna River - near "Lupovaka" area (Table 1).

Table 1. Geographic coordinates (North latitude, East longitude) and altitude of the river sites.

Station	**1 St.**	**2 St.**	**3 St.**	**4 St.**
North latitude	43^0 09' 30.5"	43^0 10' 10.3"	43^0 11' 25.9"	43^0 10' 27.0"
East longitude	23^0 29' 14.9"	23^0 30' 21.6"	23^0 31' 48.9"	23^0 27' 15.3"
altitude (a.s.l.)	801 m	564 m	422 m	608 m
Station	**5 St.**	**6 St.**	**7 St.**	**8 St.**
North latitude	43^0 11' 35.4"	43^0 11' 51.6"	43^0 13' 07.5"	43^0 14' 18.2"
East longitude	23^0 25' 30.0"	23^0 24' 38.6"	23^0 23' 35.0"	23^0 21' 33.9"
altitude (a.s.l.)	412 m	379 m	328 m	278 m
Station	**9 St.**	**10 St.**	**11 St.**	**12 St.**
North latitude	43^0 09' 31.6"	43^0 09' 56.3"	43^0 09' 56.5"	43^0 10' 45.9"
East longitude	23^0 29' 18.8"	23^0 29' 50.6"	23^0 25' 26.5"	230 24' 51.9"
altitude (a.s.l.)	777 m	615 m	575 m	490 m

River typology according to the Water Framework Directive

All studied rivers belong to the mountainous and semi-mountainous river types (R2 and R4) in Ecoregion 12 (Pontic province), according to the national typology of Bulgaria, using system B of the Water Framework Directive (Cheshmedjiev et al 2010). At the same time, a number of special cases in the typology are presented within the study area as follows:

- Rocky gorges and various rock formations
- Bedrock substrata at low altitude
- Areas with moderate to slow velocity alternating with waterfalls
- Karst deposits in bottom substrata
- Typical seasonal variations in water level (semi-dry conditions during summer and autumn)

Water chemistry

We investigated the lower zones of the main rivers (sites 3 and 8) and the high mountainous area of Cherna River (sites 11, 12). The following parameters have been measured *in situ*: dissolved oxygen (oximeter WTW Oxi 330i); pH (pH meter WTW pH330i) and conductivity (WTW Cond 330i). In the laboratory we measured $N\text{-}NH_4$ (ISO 7150-1:2002); $N\text{-}NO_2$ (EN 26777:1997); $N\text{-}NO_3$ (ISO 7890-3:1998); PO_3^{4-} and total phosphorous (EN ISO 6878:2005); total nitrogen (EN ISO 11905-1:2001); BOD_5 (EN 1899-2:2004).

Phytobenthos

Epilithic diatoms were collected from the upper surface of stones at sites 3, 8 and 11 according to the European Standard EN 13946:2003 (European Commitee for Standardization 2003). The samples were fixed *in situ* with 4% formaldehyde. In the laboratory, pretreatment of the samples was done following A.5.2 method (EN 13946/2003) with cold sulfuric acid (H_2S0_4) and potassium permanganate ($KMnO_4$). The cleaned material was mounted on permanent slides with Naphrax©. Light microscopy was performed following the European Standard EN 14407:2004 (European Committee for Standardization 2004) on Amplival Carl Zeiss, with 100x oil-immersion objective. Diatoms were identified mainly according to Krammer & Lange-Bertalot (1986-1991) and Lange-Bertalot (2001). Four hundred valves per slide were counted. Diatom pollution index IPS (Coste in CEMAGREF 1982, 1984) was calculated using Omnidia ver.5.3. (Leconite *et al.* 2003). The classification system for karst springs (R15 river type) instead of typical classes for mountain or semi-mountain conditions (R2 or R4 river types) have been used to assess properly ecological status of phytobenthos (benthic diatoms) in these explicit calcareous conditions.

Macrozoobenthos

Macrozoobenthic samples were collected from sites 1-11 using a hand-held net with mesh size of 500 μm (EN ISO 10870:2012). The multihabitat approach was applied (adapted from Cheshmedjiev *et al.* 2011). At each station 10 sub-samples from different substrates were collected, according to EN ISO 16150:2012. Ecological status was determined using the following metrics (after Cheshmedjiev & Varadinova 2013): Biotic index (adopted from Yaneva & Cheshmedjiev 1999), total taxa number (TTN index); number of species from Ephemeroptera, Plecoptera, Trichoptera orders (EPT index). The ecological assessment was carried out according to the criteria for R-4 river type (sites 3, 6, 7, 8) and R-2 river types (the remaining sites) under Regulation N-4 (for TTN index and biotic index BI) and following Cheshmedjiev & Varadinova (2013) for EPT index.

Ichthyofauna

Fish samples were collected from the downstream parts of the two studied catchments - sites 3 and 8. Scientific device for electrofishing (Hans Grassl IG 200-2) according to standard EN 14011:2003 was used. The ecological status was determined based on the BFI index v.1.8/26.3.2010 (Mihov 2010). The scope of the BFI index is presented in accordance with Regulation N-4 for R-4 river type.

Results

Water chemistry

Most of the measured values for the physical and the chemical parameters for sites 3, 8, 11 correspond to „good" or „high" ecological status (Table 2). In Cherna River near Lupovaka area (site 12) was found deterioration of the environmental situation based on the dissolved oxygen, ammonium nitrogen, phosphates, total phosphorus, total nitrogen, BOD_5. Moreover, we found serious pollution by organic substances (for instance proteins). The samples were collected on 15.XI.2013, after torrential rains, when on the water surface

was observed foaming, and the river water became white in colour.

Table 2. Ecological status of the river sites as based on the physical and chemical parameters of the water. Legend: * – high status; ** – good status; *** – moderate or lower status (outside the scope of the Regulation N-4); bold – extremely high concentrations

Site	O_2	pH	cond.	$N\text{-}NH_4$	$N\text{-}NO_2$	$N\text{-}NO_3$	PO_4^{3-}	T P	T N	BOD
3	8,20 *	8,38 **	524 *	0,023 *	0,007 *	1,47 **	0,023 **	0,04 **	1,61 ***	<1,25 **
8	10,2 *	8,65 --	367 *	0,012 *	<0,002 *	0,008 *	0,036 **	0,05 **	0,27 *	<1,25 **
11	11,8 *	8,29 **	378 *	0,008 *	<0,002 *	1,10 ***	<0,006 *	<0,007 *	1,12 **	<1,25 **
12	6,60 **	7,23 **	512 *	**0,88 *****	0,029 **	0,50 **	**0,31 *****	**1,24 *****	**1,80 *****	**5,50 *****

Phytobenthos

According to the diatom index IPS the sites were characterised as follows:

Site 3 – in "bad" ecological status (IPS=4,9). The dominant taxa were polysaprobes, tolerant to organic pollution (*Nitzschia palea* (Kützing) W.Smith, *Achnanthidium saprophilum* (H.Kobayasi & S.Mayama) Round & L.Bukhtiyarova, *Eolimna minima* (Grunow) Lange-Bertalot & W.Schiller).

Site 8 – in "good" ecological status (IPS=14,2). The dominant taxa were β-mesosaprobes (*Navicula reichardtiana* Lange-Bertalot, *Achnanthidium minutissimum* (Kützing) Czarnecki, *Diatoma vulgaris* Bory de Saint-Vincent).

Site 11 – in "high" ecological status (IPS=19,6). The dominant taxa were oligosaprobes to β-mesosaprobes (*Achnanthidium pyrenaicum* (Hustedt) H.Kobayasi, *Achnanthidium subatomus* (Hustedt) Lange-Bertalot).

Macrozoobenthos

The bottom invertebrates recorded from the mountainous sites of the catchment of Leva River were mainly xenosaprobic or oligosaprobic species (sites 1, 2). The most abundant species was *Gammarus fossarum* Koch 1835 (Amphipoda). In the semi-mountainous sector (site 3) more ubiquitous and β-mesosaprobic species were found. The most abundant taxon was *Hydropsyche* sp. (Trichoptera).

In the catchment of Cherna River the most abundant species was *Oligoneuriella rhenana* (Imhoff 1852), Ephemeroptera. This species is typical for the semi-mountainous river type in Bulgaria (R-4 type). During our study this species was found exactly at this river sector (sites 6-8). Very high abundance had *Hydropsyche* sp. (Trichoptera), which was found at almost all sites. Xeno- or oligosaprobic taxa such as: *Leuctra hirsuta* Bogoescu, Tabacaru, 1960, *Perla pallida* Guérin-Méneville, 1838, *Dinocras cephalotes* (Curtis, 1827), *D. megacephala* (Klapalek, 1907) (Plecoptera); *Epeorus* sp. (Ephemeroptera) and *G. fossarum* were found only from the mountainous sector (sites 4, 5). Overall this mixture of typical mountain reophilic indicators (Perlidae, *Epeorus* sp.), semi-mountain indicators (*O. rhenana*, plentiful *Hydropsyche* sp.) and typical karst elements (*Niphargus bureshi* Fage 1926, plentiful *G. fossarum*) define biological reference conditions for these highly karst rivers (calcareous conditions).

Generally, the ecological status of studied rivers corresponded to „good" or „high" status (Table 3). The Biotic index had the highest values in the mountainous sectors from both catchments (BI= 4 or 4,5). Downstream of the river currents, the values of the Biotic index decreased. In Cherna River catchment this decrease was within the limits of „good" ecological status (BI= 3,5) for semi-mountainous area (sites 6- 8). In the lower part of Leva River (site 3) the Biotic index had minimal value (BI= 3) and indicated „moderate" ecological status.

Indexes TTN and EPT showed a similar dynamics for both watersheds (Table 2). The highest values have been recorded in the mountainous areas of the rivers. The ecological status at these sampling sites was defined as „good" (at sites 1, 2, 6- 8 and site 5 for TTN index), and some case as „high" (at site 4 for TTN index; at sites 4 and 5 for EPT index). Only in Leva River downstream the village of Zgorigrad (site 3) deteriorated conditions were identified and the corresponding ecological status was defined as „moderate" as based on the macroinvertebrate assemblages.

Table 3. Ecological status of the river sites as based on different biological parameters of the macrozoobenthos after Regulation N-4. Legend: * – high status; ** – good status; *** – moderate status;

Index / site	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
Biotic index	4 *	3,5 **	3 ***	4,5 *	4 *	3,5 **	3,5 **	3,5 **	4 *	4 *	4,5 *
TTN index	13 **	12 **	9 ***	17 *	12 **	11 **	13 **	14 **	no	no	no
EPT index	8 **	6 **	4 ***	12 *	12 *	7 **	8 **	8 **	no	no	no

Fish

The fish fauna of the Vrachanska Mts. is composed of species that are typical for semi-mountainous Bulgarian rivers. A total of eight species have been found in the area. In Leva River (site 3) the greatest abundance and biomass had the Romanian barbell *Barbus petenyi* Heckel 1852 (77 ind., 475 gr). In addition, the fish index value indicated „moderate" ecological status (BFI = 0,54). For Cherna River (site 8) the greatest abundance had *B. petenyi* (35 ind.) and Golden spined loach *Sabanejewia balcanica* (Karaman 1922) (46 ind.), while the European chub *Squalius cephalus* (Linnaeus 1758) had the highest biomass (257 gr). Species composition and age structure of the ichthyofauna was well balanced. The value of BFI index indicated „good" ecological condition (BFI = 0,74).

Discussion

The high increase in the nutrients concentrations and deterioration of the oxygen regime on Cherna River in the mountainous area demonstrated that in the territory of the Nature Park Vrachanski Balkan there were sources of serious organic pollution that extends beyond the standards for water quality. This situation was most likely temporary and may be due to past pollution of karst groundwater, which stands out after heavy rains.

All applied biological quality elements (phytobenthos, benthic macroinvertebrates and ichthyofauna) showed that in urban areas there was deterioration in environmental conditions (mainly downstream village of Zgorigrad). However, it was assumed that no

permanent degradation of aquatic ecosystems due to drought, hydromorphological pressure or other anthropogenic changes in the catchment area of the two major watersheds. Moreover - mountain river sections were in natural conditions, anthropogenic uninfluenced and with high biological integrity.

All rivers in the Nature Park Vrachanski Balkan should be classified as a specific case of mountain river type (R2 - calcareous) or semi-mountain river type (R2 - calcareous) under seasonal semi-drying conditions. We recommend very careful application of the type-specific classification systems in this case. For example, the classification system for karst springs (R15 river type) should be used in the phytobenthic assessment, while usual classification system for mountain and semi-mountain conditions (R2 and R4 river types) are usable for a proper ecological status assessment based on analyses of benthic macroinvertebrate communities.

We suggest the application and compliance of the "*Program for the study of ecological status and chemical status of surface waters*", already developed for the needs of Directorate of the Nature Park Vrachanski Balkan and implementation of measures for prevention of any further water pollution.

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Екологична характеристика на основните речни водосбори във Врачанска планина

СВЕТОСЛАВ ЧЕШМЕДЖИЕВ, ЛЮБОМИР КЕНДЕРОВ, ТИХОМИР СТЕФАНОВ, ПЛАМЕН ИВАНОВ, ВЕСЕЛА ЕВТИМОВА, ЯНКА ВИДИНОВА, ВИОЛЕТА ТЮФЕКЧИЕВА, ТЕОДОРА ТЕОФИЛОВА

(Резюме)

Извършена е оценка на екологичното състояние на речните екосистеми от основните водосборите във Врачански Балкан (река Лева, река Черна и някои притоци). Оценката е осъществена чрез определяне на състава и структурата на фитобентоса, бентосните макробезгръбначни съобщества и рибната фауна. Изчислени са следните индекси: диатомеен индекс на замърсяването IPS, макрозообентосен Биотичен индекс и Базиран на риби индекс (BFI), приети за оценка на екологичното състояние според изискванията на Рамковата директива за водите (Директива 60/2000). Допълнително са извършени различни физични и хидрохимични анализи. Въз основа на нашите резултати, по-голямата част от планинските зони на изследваните реки са в „добро“ или „отлично“ екологично състояние. Влошаване в екологичните условия се наблюдава след някои села: за Лева река под село Згориград и за река Черна при село Долно Озирово. Това може би се дължи на замърсяване с органични вещества от населените места в областта. Регистрирано е и инцидентно замърсяване (с предимно протеинов характер) в река Черна в близост до местността Луповака.

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Paleobiodiversity of the Vrachanska Planina Mountains in the Villafranchian: a case study of the Varshets (Dolno Ozirovo) Early Pleistocene locality of fossil fauna and flora

ZLATOZAR BOEV

Abstract. The paper summarizes all data on the fossil biota established from the richest Bulgarian paleontological site. Data for a total of 166 taxa (ca. 7000 identifiable findings) of higher plants and invertebrate and vertebrate animals are presented. Their importance to the science and the paleoecology of the SE Europe is discussed. Records: Magnoliophyta (2 orders, 3 families, 5 taxa), Mollusca (1 order, 2 taxa), Amphibia (2 orders, 5 families, 10 taxa), Reptilia (2 orders, 8 (9) families, 13 taxa), Aves (10 orders, 22 families, 66 taxa), Mammalia (8 orders, 19 families, 70 taxa). Number of new taxa, described from the site: 1 species and 4 subspecies of trees and shrubs (flowering plants), 17 birds (1 genus, 16 species) and 2 mammals. A forest-steppe savannah-like landscape dominated about 2.25 mya in the region of the site.

Key words: Early Pleistocene fauna; Villafranchian biota; Biodiversity; Paleofauna, Fossil birds; Bulgaria; Balkans.

Bulgaria as a country at the crossroads of three continents (Europe, Asia and Africa), located in a region between the four seas (Black, Marmara, Aegean and Adriatic). It is a unique area in terms of paleozoogeography and paleoecology. The country has revealed unique paleontological localities and the locality near Varshets heads the row. At least 102 species of vertebrates from the Early Pleistocene (Middle Villafranchian, 2.25 million years ago) have been found so far there. They represent a unique fauna, so far unknown anywhere in the world. With this diversity, the site ranks first among the sites of that type and age in the world.

The Varshets (Dolno Ozirovo) Early Pleistocene locality of fossil fauna and flora is located in the northwestern foothills of the Vrachanska Mountain It was discovered in 1987 and until 2015 a considerable number of taxa have been identified (Table 1): 1 species and 4 subspecies of trees and shrubs (flowering plants), 16 birds and 2 mammals. One hundred and sixteen taxa have been recorded for the first time for Bulgaria: 5 plants, 10 amphibians, 6 reptiles, 36 birds and 59 mammals.

For a period of 20 years (1995-2015) over 7000 identifiable bone/teeth remains and snail shells and plant seeds have been collected. Among them the absolute dominant is a pardgige-like bird (new genus and species) - *Chauvireria* Boev, 1997 (Partridge of Cécile Mourer-Chauviré), a small phasianid, sized between modern quail and grey partridge, consisting of at least 16.44 % of the collected material (Table 1). The most complete list of the avifauna of the locality has been published by Boev (2007), although a series new taxa have been described since (Table. 1).

Furthermore, new records for the country are some fossil species described by other areas of Europe: partial grouse (*Tetrao partium*), Hozatski's bustard (*Otis khosatzkii*), Beremend Swift (*Apus baranensis*), as well as a kind of a large predatory mammal - megantereon (*Megantereon cultridens*) – mid-sized representative of the family of the saber-toothed felids. Also the site provides the first records of the European jaguar (*Panthera gombaszogensis*) and the giant cheetah (*Acinonyx pardinensis*), as well as over 50 other species of mammals. It is notable that 17 carnivore mammals (over 10 % of the taxa identified) have been recorded in the site. In addition, two new species have been described here among mammals - the small carnivorous (mustelid) mammal Balkan baranogale (*Baranogale balcanica*) and the primitive bank vole (*Clethrionomys primitivus*). Diurnal (and nocturnal) avian raptors (8 taxa) are also well presented.

The composition of the paleoavifauna of Varshets allows to formulate the hypothesis of the savannah, not the boreal forest origin of a whole family of birds - grouses (Tetraonidae) (Boev, 1995a). In the site once coexisted Rock Ptarmigan and bustards – an association which was unknown. Unique is the coexistence of the "openland"/savannah (rhinoceros, cheetahs, horses, antelopes) and "woodland"/ forest (deer, bears, jaguars, lynxes) species of large mammals. Similar is the faunal diversity of birds: The "woodland" hawfinches, bullfinches, chaffinches, woodlarks, and tits, coexisted with the "openland" bustards, ptarmigans, goldfinches, skylarks and crested larks. That is why the locality of Varshets provides best example for the s. c. "mixed" faunas in the Villafranchian. Such a faunal diversity (coexistance) is unknown among all the modern faunas of Europe, Asia and elsewhere.

The most numerous of all bone remains are the small mammals (soricomorph, erinaceomorph, rodents and lagomorphs), followed by those of birds (mainly those of Perdicinae subfamily). Most diverse are the remains of mammals (70 taxa), followed by birds (66 taxa). Among birds, the features of the bone morphology of the starling, magpie, etc. suggests new species also.

The five established (trees and shrubs) – Prebalkan hackberry (*Celtis praebalcanica*), and new hitherto unknown fossil forms of 4 species of shrubs (1) Steppe cherry (*Prunus fruticosa*), (2) Small-flowered black hawthorn (*Crataegus pentagyna*), (3) Scarlet firethorn (*Pyracantha coccinea*) and (4) Blood-twig dogwood (*Swida* [present *Cornus*] *sanguinea*) have been classified by Prof. Emanuil Palamarev as hemixerophytes (Palamarev, 2004). This excellently completes the faunal variety in small and large mammals, birds, and even reptiles and amphibians.

General habitat preferences of the established species (Table 2), "openland", "woodland", intrazonal "rock", and "aquatic" habitats, surprisingly shows an almost equal representation of the former two (openland and woodland) habitats, followed by three to four times less represented s. c. "intrazonal" habitats (rock or aquatic) ones. Thus, the established land fauna and flora shows that forest-steppe landscape, similar to the modern African savannah forest once prevailed in the area (Boev, 1995b; 1999g; 2013a). Obviously, the climate was warmer and drier than today. The present-day climate of the Vrachanska Mnt. is much more temperate-continental and the dominant landscapes are much less plain and open as 2.25 mya ago.

Table 1. Taxonomic list of the fossil plants and animals found in the Early Pleistocene locality near Varshets.

No	Scientific name	English name	Number of finds	New taxon of science	New taxon for the fossil record of Bulgaria	Source
PLANTAE Haeckel, 1866						
MAGNOLIOPHYTA Cronq., Takht. & W. Zimm., 1966						
ROSALES Perleb (1826)						
Ulmaceae Mirbel, 1815						
1	*Celtis praebalcanica* Palamarev, 2004	Prebalkan hackberry	60	+	+	Palamarev (2004)
Rosaceae Jussieu (1789)						
2	*Prunus fruticosa* Pallas, 1784 *fossilis* Palamarev, 2004	Fossil European dwarf cherry	2	+	+	Palamarev (2004)
3	*Crataegus pentagyna* Waldst. & Kit. ex Willdenow, 1800 *fossilis* Palamarev, 2004	Fossil small-flowered black hawthorn	2	+	+	Palamarev (2004)
4	*Pyracantha coccinea* Roemer, 1847 *fossilis* Palamarev, 2004	Fossil scarlet firethorn	6	+	+	Palamarev (2004)
CORNALES Dumort. (1829)						
Cornaceae Bercht. & J. Presl (1825)						
5	*Swida sanguinea* Linnaeus (1753) *fossilis* Palamarev, 2004	Fossil blood-twig dogwood	2	+	+	Palamarev (2004)
						Subtotal: 72[1]

[1] The number of the collected seeds of *Celtis praebalcanica* exceeds 350 (Boev, 1999).

ANIMALIA Linnaeus, 1758						
MOLLUSCA Linnaeus, 1758						
GASTROPODA Cuvier, 1795						
6	Gastropoda terrestria indet. - 1	Land snail - 1	>3			Boev (1991; 2013a)
7	Gastropoda terrestria indet. - 2	Land snail - 2	>3			Boev (1991; 2013a)
						***Subtotal:* >6**
CHORDATA Haeckel, 1874[1][						
AMPHIBIA Blainville, 1816						
CAUDATA Fischer von Waldheim, 1813						
Salamandridae Goldfuss, 1820						
8	*Triturus* Rafinesque, 1815 sp.	Crested newt			+	M. Böhme – unpubl. data
9	Salamandridae sp. indet.	Salamanders/Newts			+	N. Tzankov – unpubl. data
10	*Lissotriton* Bell, 1839 sp.	(Newt)			+	N. Tzankov – unpubl. data
ANURA Fischer von Waldheim, 1813						
Palaeobatrachidae Cope, 1865						
11	Palaeobatrachidae sp. indet.	(Paleobatrachid)			+	M. Böhme – unpubl. data
Pelobatidae Bonaparte, 1850						
12	*Eopelobates* Parker, 1929 sp.	(Eopelobates)			+	M. Böhme – unpubl. data
Ranidae Batsch 1796						
13	*Pelophylax* Fitzinger, 1843 sp.	Water Frog	~		+	M. Böhme – unpubl. data

14	*Rana temporaria* Linnaeus, 1758	Common frog	~		+	M. Böhme – unpubl. data
15	*Rana* cf. *graeca* Boulenger, 1891	Greek stream frog	~		+	M. Böhme – unpubl. data
Bufonidae Gray, 1825						
16	*Bufo* cf. *bufo* (Linnaeus, 1758)	Common toad			+	M. Böhme – unpubl. data
17	*Bufo viridis* (Laurenti, 1768)	European green Toad			+	M. Böhme – unpubl. data
						Subtotal: > 500
REPTILIA Laurenti, 1768						
SQUAMATA Oppel, 1811						
Scincidae Gray, 1825						
18	*Mabuya* (*Trachylepis* cf. *aurata* (Linnaeus, 1758)	Golden grass mabuya			+	M. Böhme – unpubl. data
19	*Mabuya* Fitzinger, 1826 sp.	Mabuya			+	M. Böhme – unpubl. data
Lacertidae Oppel, 1811						
20	*Lacerta* s. l. sp. - 1	(Lizard – 1)				M. Böhme – unpubl. data
21	*Lacerta* s.l. sp. - 2	(Lizard – 2)				M. Böhme – unpubl. data
Anguidae Gray, 1825						
22	*Anguis fragilis* Linnaeus, 1758	Slow Worm			+	M. Böhme – unpubl. data
23	*Pseudopus* aff. *apodus* (Pallas, 1775)	European glass lizard			+	M. Böhme – unpubl. data
Colubridae Oppel, 1811						
24	Colubrinae sp. - 1	(Rat snakes/ etc. - 1)				M. Böhme – unpubl. data

25	Colubrinae sp. - 2	(Rat snakes/ etc. - 2)				M. Böhme – unpubl. data
Natricinae Bonaparte, 1838						
26	Natricinae sp.	(European grass snakes etc.)				M. Böhme – unpubl. data
Viperidae Oppel, 1811						
27	Viperidae sp.	(Vipers)			+	M. Böhme – unpubl. data
Boidae Gray, 1825						
28	? Erycinae Bonaparte, 1831 sp.	(Sand boas etc.)			+	M. Böhme – unpubl. data
TESTUDINES Linnaeus, 1758						
Testudinidae Batsch, 1788						
29	*Testudo* Linnaeus, 1758 sp.	(Tortoises)				M. Böhme – unpubl. data
Emydidae Rafinesque, 1815						
30	*Emys* Duméril, 1805 sp.	(Pond turtles)				N. Tzankov – unpubl. data
Subtotal: > 1500						
AVIALE Gauthier, 1986						
AVES Linnaeus, 1758						
ANSERIFORMES (Wagler, 1831)						
Anatidae Vigors, 1825						
31	Anatinae gen.	Dabbling ducks	1			Boev (2007)
ACCIPITRIFORMES Vieillo1816						
Accipitridae (Vieillot, 1816)						
32	*Gyps bochenskii* Boev, 2010	Gryffon of Zygmunt Bocheński	6	+	+	Boev (2010)
33	*Aquila kurochkini* Boev, 2013b	Eagle of Evgeniy Kurochkin	8	+	+	Boev (2013b)
34	*Circaetus haemusensis* Boev, 2015a	Haemus Mountain Snake-eagle		+		Boev (2015a)

35	*Buteo* sp.	Buzzard	1		+	Boev (2002; 2007)
36	*Accipiter* sp.	Goshawks/ sparrowhawk	2		+	Boev (1996; 2002; 2007)
37	Acctpitndae gen.	(Hawks etc.)	1			Boev (2002; 2007)
FALCONIFORMES (Sharpe, 1874)						
Falconidae Vigors, 1824						
38	*Falco bakalovi* Boev, 1999a	Falcon of Petar Bakalov	27	+	+	Boev (1999a; 2011)
GALLIFORMES Temminc1820						
Tetraonidae Vigors, 1825						
39	*Lagopus balcanicus* Boev, 1995a	Balkan ptarmigan	41	+	+	Boev (1994; 1995a)
40	*Tetrao partium* (Kretzoi, 1962)	Partial grouse	15		+	Boev (1994; 1999b 2002)
41	*Tetrao/Lagopus*	Grouse/Ptarmigan	3			Boev (1994; 1996; 2002)
Phasianidae Vigors, 1825						
42	*Chauvireria balcanica* Boev, 1997	Balkan Partridge of Cécile Mourer-Chauviré	1138	+		Boev (1997)
43	cf. *Perdix* sp.	Grey partridge	13			Boev (1991)
44	Perdicinae gen. indet.	Partidge	1			Boev (2002; 2007)
45	Phasianidae gen. indet.	Phasianid	15			Boev (2007)
GRUIFORMES Coues, 1884						
Rallidae Reichenbach, 1882						
46	*Gallinula balcanica* Boev, 1999c	Balkan Moorhen	1	+	+	Boev (1999c)
47	*Porzana botunensis* Boev, 2015b	Crake of Botunya River)	1	+	+	Boev (2007; 2015b)

Otitidae Gra1845						
48	*Otis* cf. *khosatzkii*	Khosatzkii's bustard	5		+	Boev (1999d)
49	Otididae gen. indet.	Bustard	2			Boev (1996; 1999d; 2002; 2007)
CHARADRIIFORMES Huxley, 1867						
Scolopacidae Vigors, 1825						
50	*Actitis balcanica* Boev, 1998a	Balkan sandpipper	1	+	+	Boev (1998a)
51	Charadriiformes fam. indet.	(Waders etc.)	1			Boev (2002; 2007)
COLUMBIFORMES (Latham, 1790)						
Columbidae (Illiger, 1811)						
52	*Columba* sp. - 1	Wood-pigeon	2		+	Boev (1997; 2002; 2007)
53	*Columba* sp. - 2	Wood-pigeon	4		+	Boev (1997; 2002; 2007)
54	*Streptopelia* sp.		3		+	Boev (2002; 2007)
STRIGIFORMES (Wagler, 1830)						
Strigidae Vigors, 1825						
55	*Athene* sp.	Little owl	1		+	Boev (2002; 2007)
APODIFORMES Peters, 1940						
Apodidae (Hartert, 1897)						
56	*Apus baranensis* Janossy, 1977		9		+	Boev (2000)
PASSERIFORMES (Linnaeus, 1758)						
Alaudidae (Vigors, 1825)						
57	*Alauda xerarvensis* Boev, 2012	Dry-field skylark	4	+	+	Boev (2012)
58	*Galerida bulgarica* Boev, 2012	Bulgarian crested lark	2	+	+	Boev (2012)

59	*Eremophila prealpestris* Boev, 2012	Pre-Alpine horned lark	2	+	+	Boev (2007; 2012)
60	*Lullula balcanica* Boev, 2012	Balkan woodlark	1	+	+	Boev (2007; 2012)
61	*Melanocorypha donchevi* Boev, 2012	Steppe lark of Stefan Donchev	3	+	+	Boev (2007; 2012)
Motacillidae Vigors, 1825						
62	*Anthus* sp.	Pipit	3		+	Boev (1996; 1997; 2002; 2007)
63	*Motacilla* sp.	Wagtail	1		+	Boev (1997; 2002; 2007)
Fringillidae Vigors, 1825						
64	*Coccothraustes simeonovi* Boev, 1998b	Hawfinch of Simeon Simeonov	6	+	+	Boev (1998b)
65	*Loxia patevi* Boev, 1999e	Crossbill of Pavel Patev	5		+	Boev (1999e)
66	*Fringilla* cf. *coelebs*	Common chaffinch	8		+	Boev (1994; 2007)
67	*Fringilla* sp.	Finch	4			Boev (2007)
68	*Carduuelis* cf. *carduelis*	European goldfinch	5		+	Boev (2007)
69	*Carduelis* sp.	Finches/ Linnets/ Serins	7			Boev (1997; 2007)
70	*Pyrrhula* sp.	Bullfinch				Boev (1997)
71	Fringillidae gen. indet.	Finches	8			Boev (2007)
Paridae Boie, 1826						
72	*Parus* sp. ex gr. *major*	Great tit	3		+	Boev (2002; 2007)
73	*Parus* sp.	Tit	5			Boev (1997; 2002; 2007)
74	Paridae gen.	Tits	1			Boev (2002; 2007)

Sylviidae (Vigors, 1825)						
75	cf. Sylviidae gen.	Old World Warblers	1			Boev (2002; 1997)
Regulidae, Vigors, 1825						
76	*Regulus bulgaricus* Boev, 1999f	Bulgarian kinglet	1	+	+	Boev (1999f)
Muscicapidae Vigors, 1825						
77	cf. *Muscicapa* sp.	Flycatcher	1			Boev (1996; 2002; 1997)
Corvidae Vigors, 1825						
78	*Pyrrchocorax* cf. *pyrrhocorax*	Red-billed chough	1			Boev (2002; 2007)
79	*Pyrrhocorax* cf. *graculus*	Yellow-billed chough	12			Boev (1991; 1994; 2002)
80	*Pyrrhocorax* sp.	Chough	20			Boev (1996; 2002; 2007)
81	*Nucifraga* sp.	Nutcracker	1		+	Boev (2002; 2007)
81	*Pica* sp.	Magpie	14		+	Boev (2002; 2007)
81	*Corvus* cf. *monedula*	Western jackdaw	34			Boev (1991; 2002)
84	*Corvus* sp.	Crow/Rook	4			Boev (1997; 2002)
85	Corvidae gen. indet.	Corvids	3			Boev (2002; 2007)
Sturnidae Vigors, 1825						
86	*Sturnus* sp.	Starling	3		+	Boev (1994; 1996; 2002; 2007)

Turdidae Bonaparte, 1838						
87	*Turdus* sp. ex gr. *merula*	Blackbird	2		+	Boev (2002; 2007)
88	*Turdus* sp.	Trush	2			Boev (1997; 2002; 2007)
89	*Turdus* sp. ex gr. *philomelos*	Song trush	3			Boev (2002; 2007)
90	*Turdus* cf. *iliacus*	Redwing	1		+	Boev (2002; 2007)
91	*Erilhacus* sp.	Robin	1		+	Boev (2002; 2007)
92	Turdidae gen. indet.	Trushes	1			Boev (2002; 2007)
Emberizidae Vigors, 1831						
93	*Emberiza* sp.	Bunting	4		+	Boev (1996; 1997; 2002; 2007)
94	Emberizidae gen. indet.	Buntings	2			Boev (2002; 2007)
Aves indet.						
95	Oscines fam. indet.	Song birds	7			Boev (2002; 2007)
96	Aves ordo indet.	Birds	156			Boev (2007)
						Subtotal: 1589
MAMMALIA Linnaeus, 1758						
SORICOMORPHA Gregory, 1910						
Soricidae G. Fischer, 1814						
97	*Beremendia fissidens* (Petenyi, 1864)	(Red-toothed shrew)	218		+	Popov (2004b); Rzebik-Kowalska, Popov (2005)

98	*Asoriculus gibberodon* (Petenyi, 1864)	(Red-toothed shrew)	256		+	Popov (2004b); Rzebik-Kowalska, Popov (2005)
99	*Asoriculus kubinyii* (Kormos, 1934)[2]	(Red-toothed shrew)			+	Popov (2004b)
100	*Petenyia hungarica* Kormos, 1934	Hungarian petenyia shrew	>45		+	Popov (2004b); Rzebik-Kowalska, Popov (2005)
101	*Mafia* cf. *csarnotensis* Reumer, 1984	Csarnota mafia shrew			+	Popov (2004b); Rzebik-Kowalska, Popov (2005)
102	*Sorex* cf. *minutus* Linnaeus, 1766	Eurasian pygmy shrew	39		+	Popov (2004b); Rzebik-Kowalska, Popov (2005)
103	*Sorex runtonensis* Hinton, 1911	Runton's shrew	22		+	Popov (2004b); Rzebik-Kowalska, Popov (2005)
ERINACEOMORPHA Gregory, 1910						
Erinaceidae Fischer von Waldheim, 1817						
104	*Erinaceus* sp.	Hedgehog				Popov (2004a)
105	*Erinaceus* cf. *lechei* Kormos, 1934	Leche's hedgehog	9		+	Popov (2004a); Rzebik-Kowalska, Popov (2005)

[2] Recently considered as *Asoriculus gibberodon* (Petenyi, 1864) (Mészáros, L. G. 1999).

Talpidae Fischer von Waldheim, 1817						
106	*Talpa* cf. *levantis* Thomas, 1906	Levant mole	59			Popov (2004a); Rzebik-Kowalska, Popov (2005)
107	*Talpa* cf. *csarnotana* Kretzoi, 1959	Csarnota mole			+	Popov (2004a)
108	*Talpa* sp.	Mole				Popov (2004a)
109	*Scalopoides* cf. *copernici* (Skoczen, 1980)	Copernicus' SCALOPINE	4		+	Popov (2004a); Rzebik-Kowalska, Popov (2005)
110	*Quyania polonica* (Skoczen, 1980)[3]	Polish neurotrichus mole	6		+	Popov (2004a); Rzebik-Kowalska, Popov (2005)
111	*Desmana* cf. *polonica* Pashkov et Topachevskyj, 1990	Polish desman	4		+	Popov (2004a); Rzebik-Kowalska, Popov (2005)
LAGOMORPHA Brandt, 1855						
Leporidae Fischer, 1817						
112	*Trischizolagus* sp.					Popov (2004b)
CHIROPTERA Blumenbach, 1779						
Rhinolophidae Gray, 1825						
113	*Rhinolophus* cf. *lissiensis* (Mein, 1964)	(Horseshoe bat)			+	Popov (2004b)
114	*Rhinolophus* ex gr. *ferrumequinum* (Schreber, 1774)	Greater horseshoe bat				Popov (2004b)
Vespertilionidae Gray, 1821						
115	*Vespertilio* sp.	(Evening bat)			+	Popov (2004b)
116	*Myotis* cf. *blythii* Tomes, 1857	Lesser mouse-eared bat			+	Popov (2004b)

[3] Recently considered as *Neurotrichus polonicus* Skoczeń, 1980 (Rzebik-Kowalska, B. 2014).

117	*Myotis* cf. *gundersheimensis* Heller, 1936	Estramos mouse-eared bat			+	Popov (2004b)
118	*Myotis estramonensis* Topal, 1983	Shaub's mouse-eared bat			+	Popov (2004b)
119	*Myotis* cf. *shaubi* Kormos, 1934	Mouse-eared bat			+	Popov (2004b)
120	*Myotis* cf. *exillis* He1ler, 1936	Mouse-eared bat			+	Popov (2004b)
121	*Plecotus* cf. *crassidens* Kormos, 1930	Long-eared bats			+	Popov (2004b)
122	*Miniopterus schreibersii* (Kuh1, 1819)	Common bent-wing bat				Popov (2004b)
RODENTIA Bowdich, 1821						
Cricetidae J. Fischer, 1817						
123	*Cricetus runtonensis* (Newton, 1909)	Runton's hamster			+	Popov (2004b)
124	*Ungaromys nanus* Kormos, 1933	Lesser Hungarian vole			+	Popov (2004b)
125	*Clethrionomys primitivus* Popov, 2001[4]	Primitive red-backed vole	547	+	+	Popov (2004b)
126	*Cseria opsia* Rabeder, 1981	(Cseria vole)	23		+	Popov (2004b)
127	*Borsodia petenyii* (Mehely, 1914)	Petenyi's vole	5		+	Popov (2004b)
128	*Villanyia exilis* Kretzoi, 1956	Slender villany vole			+	Popov (2004b)
129	*Villanyia petenyii*	Petenyii's villany vole			+	Popov (2004b)
130	*Villanyia altisomosa*	(Villanyi vole)			+	Popov (2004b)
131	*Castillomys* sp.	(Castile mouse)			+	Popov (2004b)
132	*Mimomys pliocaenicus* Forsyth Major, 1902	Pliocene vole	790		+	Petrov (1992); Popov (2001; 2004b)
133	*Mimomys* (*Pusillomimus*) *reidi* Hinton, 1910	Reid's vole	483		+	Popov (2001; 2004b)
134	*Mimomys* (*Pusillomimus*) *stenokorys* Rabeder, 1981	(Stenokorys vole)	385		+	Petrov (1992; 2001; 2004b)
Muridae Illiger, 1811						
145	*Sylvaemus dominans* Kretzoi, 1959				+	Popov (2004b)
136	*Rhagapodemus* sp.				+	Popov (2004b)
Gliridae Muirhead in Brewster, 1819						
137	*Myomimus* sp.	Mouse-tailed dormouse			+	Popov (2004b)

[4] Recently the genus *Clethrionomys* Tilesius, 1850 is considered as *Myodes* Pallas, 1811 (Musser, Carleton. 2005).

138	*Glis minor* Kowalski, 1956	Lesser edible dormouse			+	Popov (2004b)
139	*Glis* cf. *sackdillingensis* (Heller, 1930)	Sakdillingen edible dormouse			+	Popov (2004b)
Spalacidae Gray, 1821						
140	*Pliospalax compositodontus* (Topachevskyi, 1969)	(Pliocene subterranean mole-rat)			+	Popov (2004b)
CARNIVORA Bowdich, 1821						
Canidae G. Fischer de Waldheim, 1817						
141	*Canis* ex gr. *etruscus* Major, 1877	Etruscan jackal			+	
142	*Vulpes alopecoides* F. Major, 1877	Bald fox	2		+	Spassov (1997; 2000); Spassov, Cregut-Bonnoure (1999)
143	*Nyctereutes* cf. *tingi* Tedford et Qiy, 1991	Ting's raccoon dog	>3		+	Spassov (1997] 2000); Spassov, Cregut-Bonnoure (1999)
Ursidae G. Fischer de Waldheim, 1817						
144	*Ursus* cf. *wenzensis* Stach, 1953	Weze bear			+	
145	*Ursus minimus* D. de Chabriol, Bouillet, 1827 - *U. etruscus* Cuv. 1823	Lesser bear			+	Spassov (1997); Spassov, Cregut-Bonnoure (1999)
Mustelidae G. Fischer de Waldheim, 1817						
146	*Martes wenzensis* Stach, 1959 - *M. vetus* Kretzoi, 1942	Weze martin	1		+	Spassov (1997; 2000); Spassov, Cregut-Bonnoure (1999)

147	*Pannonictis ardea* (Bravard, 1828)	(Pannonictis mustelid)	1		+	Spassov (1997; 2000); Spassov, Cregut-Bonnoure (1999)
148	*Vormela petenyii* Kretzoi, 1942	Petenyi's marbled polecat	2		+	Spassov (2000; 2001); Spassov, Cregut-Bonnoure (1999)
148	*Meles thorali* Viret, 1951	Thoral's badger	2		+	Spassov (1997; 2000)
150	*Baranogale balcanica* Spassov, 2001	Balkan baranogale		+	+	Spassov (2000; 2001)
		Hyaenidae Gray, 1821				
151	Hyaenidae gen. (non P. *breviroslris*)	(Hyaena)	3			Spassov (2000)
152	*Pliocrocuta perrieri* (Croizet, Jobert, 1828)	Perrier's hyaena	1		+	Spassov (1997; 2000) ; Spassov, Cregut-Bonnoure (1999)
		Felidae Waldheim, 1817				
153	*Lynx issiodorensis issiodorensis* (Croizet, Jobert, 1828)	Issoire lynx			+	Spassov (1997; 2000); Spassov, Cregut-Bonnoure (1999)
154	*Panthera* cf. *gombaszogensis* (Kretzoi, 1938)[5]	European jaguar			+	

[5] Recently considered as *Panthera onca gombaszoegensis* (Kretzoi, 1938) (Moll et al., 2011).

155	*Acinonyx pardinensis* Croizet, Jobert, 1828	Giant cheetah	>4		+	Spassov (1997; 2000; 2011); Spassov, Cregut-Bonnoure (1999)
156	*Viretailurus* aff. *schaubi* (Hemmer, 1964)[6]	Owen's panther	>2		+	Spassov (1997; 2000); Spassov, Cregut-Bonnoure (1999)
157	*Megantereon cultridens* (Cuvier, 1824)	Long-toothed megantereon	2		+	Boev (2008)
ARTIDACTYLA Owen, 1848						
Cervidae Goldfuss, 1820						
158	cf. *Cervus philisi* Schaub, 1941[7]	Philis' deer	>3		+	Spassov (1997; 2000); Spassov, Cregut-Bonnoure (1999)
159	*Eudadoceros* cf. *senezensis seneszensis*[8] (Deperet, 1910)	(Senez well-branched antler Deer)			+	Popov (2004)
160	*Eudadoceros senezensis* cf. *vireti* Heintz, 1970	(Senez well-branched antler deer)	~		+	Spassov (1997; 2000); Spassov, Cregut-Bonnoure (1999)
161	*Eucladoceros ctenoides*	Well-branched antler				Spassov (2005)
162	Cervidae gen. et sp. indet.	Deers	>2			Spassov (1997; 2000)

[6] Recently considered as *Puma pardoides* (Owen, 1846).

[7] Recently considered as *Metacervoceros rhenanus* (Dubois, 1904).

[8] After Nikolay Spassov (NMNHS) this subspecies is not found in the locality.

Bovidae Gray, 1821						
163	*Megalovis* aff. *latifrons* Schaub, 1923	Wide-fronted megalovis	>2		+	Spassov (1997; 2000); Spassov, Cregut-Bonnoure (1999)
164	*Gazellospira* sp.	Spiral-horned gaszella/antelope	1			Spassov (1997); Spassov, Cregut-Bonnoure (1999)
PERISSODACTYLA Owen, 1848						
Rhinocerotidae Gray, 1820						
165	cf. *Stephanorhinus etruscus*	Etruscan rhinoceros				Spassov (2005)
Equidae Gray, 1821						
166	*Equus stenonis vireti* Prat, 1964	Stenon's horse	>2		+	Spassov (1997; 2000)
						Subtotal: >2976
						Total: >6921

Table 2. Habitat distribution of the established taxa from the Early Pleistocene locality near Varshets.

No	Scientific name	Open-land	Wood-land	Rock	Aquatic
1	*Celtis praebalcanica*	+			
2	*Prunus fruticosa fossilis*	+			
3	*Crataegus pentagyna fossilis*	+			
4	*Pyracantha coccinea fossilis*	+			
5	*Swida sanguinea fossilis*	+			
6	Gastropoda terrestria indet. - 1				
7	Gastropoda terrestria indet. - 2				
8	*Triturus* sp.				+
9	Salamandridae sp. indet.				+
10	*Lissotriton* sp.				+
11	Palaeobatrachidae sp. indet.				
12	*Eopelobates* sp.	+			
13	*Pelophylax* sp.				+
14	*Rana temporaria*				+
15	*Rana* cf. *graeca*				+
16	*Bufo* cf. *bufo*		+		
17	*Bufo viridis* [1]			+	
18	*Mabuya* (*Trachylepis* cf. *aurata*)				
19	*Mabuya* sp.				
20	*Lacerta* s. l. sp. - 1				
21	*Lacerta* s.l. sp. - 2				
22	*Anguis fragilis*		+		
23	*Pseudopus* aff. *apodus*	+			
24	Colubrinae sp. - 1				
25	Colubrinae sp. - 2				
26	Natricinae sp.				+
27	Viperidae sp.				
28	? Erycinae	+			
29	*Testudo* sp.	+			
30	*Emys* sp.				+
31	Anatinae gen.				+
32	*Gyps bochenskii*	+			
33	*Aquila kurochkini*		+		
34	*Circaetus haemusensis*	+			
35	*Buteo* sp.		+		
36	*Accipiter* sp.		+		
37	Acctpitndae gen.		+		
38	*Falco bakalovi*	+			
39	*Lagopus balcanicus*	+			
40	*Tetrao partium*		+		
41	*Tetrao/Lagopus*				
42	*Chauvireria balcanica*	+			
43	cf. *Perdix* sp.	+			
44	Perdicinae gen. indet.				
45	Phasianidae gen. indet.				
46	*Gallinula balcanica*				+
47	*Porzana botunensis*				+
48	*Otis* cf. *khosatzkii*	+			

49	Otididae gen. indet.	+			
50	*Actitis balcanica*				+
51	Charadriiformes fam. indet.				+
52	*Columba* sp. - 1				
53	*Columba* sp. - 2				
54	*Streptopelia* sp.	+			
55	*Athene* sp.	+			
56	*Apus baranensis*			+	
57	*Alauda xerarvensis*	+			
58	*Galerida bulgarica*	+			
59	*Eremophila prealpestris*	+			
60	*Lullula balcanica*		+		
61	*Melanocorypha donchevi*	+			
62	*Anthus* sp.	+			
63	*Motacilla* sp.				+
64	*Coccothraustes simeonovi*		+		
65	*Loxia patevi*		+		
66	*Fringilla* cf. *coelebs*		+		
67	*Fringilla* sp.		+		
68	*Carduuelis* cf. *carduelis*	+			
69	*Carduelis* sp.	+			
70	*Pyrrhula* sp.		+		
71	Fringillidae gen. indet.				
72	*Parus* sp. ex gr. *major*		+		
73	*Parus* sp.		+		
74	Paridae gen.		+		
75	cf. Sylviidae gen.		+		
76	*Regulus bulgaricus*		+		
77	cf. *Muscicapa* sp.		+		
78	*Pyrrchocorax* cf. *pyrrhocorax*			+	
79	*Pyrrhocorax* cf. *graculus*			+	
80	*Pyrrhocorax* sp.			+	
81	*Nucifraga* sp.		+		
82	*Pica* sp.		+		
83	*Corvus* cf. *monedula*	+			
84	*Corvus* sp.				
85	Corvidae gen. indet.				
86	*Sturnus* sp.		+		
87	*Turdus* sp. ex gr. *merula*		+		
88	*Turdus* sp.		+		
89	*Turdus* sp. ex gr. *philomelos*		+		
90	*Turdus* cf. *iliacus*		+		
91	*Erilhacus* sp.		+		
92	Turdidae gen. indet.				
93	*Emberiza* sp.	+			
94	Emberizidae gen. indet.	+			
95	Oscines fam. indet.				
96	Aves ordo indet.				
97	*Beremendia fissidens*		+		
98	*Asoriculus gibberodon*		+		
99	*Asoriculus kubinyii*		+		
100	*Petenyia hungarica*		+		

101	*Mafia* cf. *csarnotensis*		+		
102	*Sorex* cf. *minutus*		+		
103	*Sorex runtonensis*		+		
104	*Erinaceus* sp.		+		
105	*Erinaceus* cf. *lechei*		+		
106	*Talpa* cf. *levantis*		+		
107	*Talpa* cf. *csarnotana*		+		
108	*Talpa* sp.		+		
109	*Scalopoides* cf. *copernici*				
110	*Quyania polonica*				
111	*Desmana* cf. *polonica*				+
112	*Trischizolagus* sp.	+			
113	*Rhinolophus* cf. *lissiensis*		+		
114	*Rhinolophus* ex gr. *ferrumequinum*			+	
115	*Vespertilio* sp.	+			
116	*Myotis* cf. *blythii*			+	
117	*Myotis* cf. *gundersheimensis*			+	
118	*Myotis estramonensis*			+	
119	*Myotis* cf. *shaubi*			+	
120	*Myotis* cf. *exillis*			+	
121	*Plecotus* cf. *crassidens*			+	
122	*Miniopterus schreibersii*			+	
123	*Cricetus runtonensis*	+			
124	*Ungaromys nanus*	+			
125	*Clethrionomys primitivus*	+			
126	*Cseria opsia*	+			
127	*Borsodia petenyii*	+			
128	*Villanyia exilis*	+			
129	*Villanyia petenyii*	+			
130	*Villanyia altisomosa*	+			
131	*Castillomys* sp.	+			
132	*Mimomys pliocaenicus*	+			
133	*Mimomys* (*Pusillomimus*) *reidi*	+			
134	*Mimomys* (*Pusillomimus*) *stenokorys*	+			
135	*Sylvaemus dominans*		+		
136	*Rhagapodemus* sp.				
137	*Myomimus* sp.		+		
138	*Glis minor*		+		
139	*Glis* cf. *sackdillingensis*		+		
140	*Pliospalax compositodontus*	+			
141	*Canis* ex gr. *etruscus*	+			
142	*Vulpes alopecoides*	+			
143	*Nyctereutes* cf. *tingi*	+			
144	*Ursus* cf. *wenzensis*		+		
145	*Ursus minimus - U. etruscus*		+		
146	*Martes wenzensis - M. vetus*		+		
147	*Pannonictis ardea*	+			
148	*Vormela petenyii*	+			
149	*Meles thorali*		+		
150	*Baranogale balcanica*	+			
151	Hyaenidae gen. (non P. *breviroslris*)	+			
152	*Pliocrocuta perrieri*	+			

153	*Lynx issiodorensis issiodorensis*		+		
154	*Panthera* cf. *gombaszogensis*		+		
155	*Acinonyx pardinensis*	+			
156	*Viretailurus* aff. *schaubi*	+			
157	*Megantereon cultridens*	+			
158	cf. *Cervus philisi*		+		
159	*Eudadoceros* cf. *senezensis seneszensis*		+		
160	*Eudadoceros senezensis* cf. *vireti*		+		
161	*Eucladoceros ctenoides*		+		
162	Cervidae gen. et sp. indet.		+		
163	*Megalovis* aff. *latifrons*	+			
164	*Gazellospira* sp.	+			
165	cf. *Stephanorhinus etruscus*	+			
166	*Equus stenonis vireti*	+			
	Total	**(59)**	**(56)**	**(13)**	**(15)**

[1] At present the scientific name of that species is *Bufotes viridis* (Laurenti, 1768).

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Палеобиоразнообразието на Врачанска планина през вилафранка: примерно изследване на ранно-плейстоценското находище Вършец (Долно Озирово) на фосилна фауна и флора

ЗЛАТОЗАР БОЕВ

(Резюме)

Обобщени са всички данни за фосилната биота, установени в най-богатото палеонтологично находище в България. Представени са данните за общо 166 таксона (ок. 7000 определяеми останки) от висши растения и безгръбначни и гръбначни животни. Анализирано е тяхното значение за палеоекологията на Югоизточна Европа. Установени са: Magnoliophyta (2 разреда, 3 семейства, 5 таксона), Mollusca (1 разред, 2 таксона), Amphibia (2 разреда, 5 семейства, 10 таксона, Reptilia (2 разреда, 8 (9) семейства, 13 таксона), Aves (10 разреда, 22 семейства, 66 таксона), Mammalia (8 разреда, 19 семейства, 70 таксона). Брой на новите за световната наука таксони, описани от находището: 1 вид и 4 подвида дървета и храсти, 17 птици (1 род, 16 вида) и 2 вида бозайници. Съставът доказва доминирането на лесостепен саваноподобен ландшафт в околностите на находището преди около 2,25 млн. г. в условията на по-топъл и по-сух климат от съвременния в района.

Bechev, D. & Georgiev, D. (Eds.),
Faunistic diversity of Vrachanski Balkan Nature Park.
ZooNotes, Supplement 3, Plovdiv University Press,
Plovdiv, 2016

Faunistic diversty of Vrachanki Balkan Nature Park

Dimitar Bechev, Anelia Stojanova, Aneliya Pavlova, Ivanka Popova

Abstract. The whole faunistic data in this issue are summarized for more realistic assessment of the number of the recent animal taxa inhabiting the region. About 2216 recent species that belong to 1217 genera and 350 families are recorded to the fauna of the Vrachanska Planina Mts. and the Vrachanki Balkan Nature Park. More than 36 species are considered as local endemics for Vrachanska Planina Mts., 20 species – as Bulgarian endemics and 34 species – as endemics for the Balkan Peninsula.

Key words: fauna, NW Bulgaria.

Introduction

The Vrachanska Planina Mts. is situated in North-Western Bulgaria, north of the main chain of Stara Planiana Mts. The main part of the mountain is a protected area, the Vrachanski Balkan Nature Park, and also the Vrachanski Karst Reserve. More information about the geographic features is presented in Bechev & Georgiev (2016).

Methods

The whole available information concerning the fauna of the region is summarized and compared from the Management plan of Nature Park "Vrachanski Balkan" (Plan) and from the publications in this issue (This issue). Based on the new data, more realistic assessment of the number of the recent animal taxa inhabiting the region was made. The exact number of the endemic species at this stage is difficult to calculate.

Results and Discussion

The summarized information about known animal taxa in the research area is presented in Table 1. Based on the included new data in this issue, we can conclude that to the fauna of the Vrachanska Planina Mts. and the Nature Park Vrachanski Balkan about 2216 species that belong to 1217 genera and 350 families have been reported till now. More than 36 species are considered as local endemics for Vrachanska Planina Mts., 20 species – as Bulgarian endemics and 34 species – as endemics for the Balkan Peninsula. Most of the endemics are cave species (troglobites).

The number of species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC is: Invertebrates – 13, Amphibia – 3, Reptilia – 3, Aves – 61, Pisces – 4, Mammalia – 16 (summarized from: Natura 2000 - Standard Data Form).

Table 1. Number of the recorded recent animal taxa to the region. **Abbreviations**: VM = local endemics for Vrachanska Planina Mts., BG = Bulgarian endemics, BP = endemics for the Balkan Peninsula.

		Number according Plan		Number according This issue			
Taxa	Rang	Total number	Number endemic species	Total number	New to region	Number endemic species	Revised total number
Acanthocephala	families			2			2
	genera			2			2
	species			4			4
Gastropoda and Bivalvia - aquatic	families	7	2 BP	7		3 VM	7
	genera	13		10			10
	species	20		13			13
Gastropoda terrestrial	families	28	4 VM, 4 BG, 9 BP	30		7 VM, 3 BG, 14 BP	30
	genera	59		54			54
	species	90		90	12		90
Crustacea - groundwater	families			10		2 VM, 1 BP	10
	genera			22			22
	species			31			31
Scorpiones	families	1		1		1 BP	1
	genera	1		1			1
	species	1		1			1
Pseudoscorpiones	families	4					4
	genera	6					6
	species	10					10
Araneae	families	19	4 VM, 3 BG, 3 BP	22		3 BG, 4 BP	22
	genera	72		77			77
	species	113		110	32		110
Myriapoda	families	12	2 VM, 3 BG, 3 BP				12
	genera	20					20
	species	36					36
Tardigrada	families			2			2
	genera			6			6
	species			6			6
Ephemeroptera	families			7			7
	genera			11			11
	species			18	12		18
Odonata	families			7			7
	genera			8			8
	species			8			8
Plecoptera	families			7		4 BP	7
	genera			12			12
	species			20	3		20

Blattodea	families			1			1
	genera			1			1
	species			1			1
Mantodea	families			1			1
	genera			1			1
	species			1			1
Orthoptera	families	7	2 BG, BP	6	2	1 BG, 5 BP	6
	genera	32		55	16		55
	species	47		79	31		79
Trichoptera	families	1		7	7	1 BP	7
	genera	3		13	13		13
	species	6		21	21		21
Carabidae (Coleoptera)	families	1	11 VM, 3 BG, 0 BP				1
	genera	35					35
	species	96					96
Scarabaeoidea (Coleoptera)	families			4			4
	genera			29			29
	species			64	45		64
Chrisomelidae (Coleoptera)	families			1			1
	genera			46			46
	species			154	82		154
Lepidoptera	families	17	2 BP				17
	genera	159					159
	species	214					214
Crabronidae (Hymrnoptera)	families	1					1
	genera	5					5
	species	6					6
Formicidae (Hymrnoptera)	families			1			1
	genera			13			13
	species			29	10		29
Sciaroidea (Diptera)	families	6	3 VM, 2 BP	5		1 VM, 1 BP	5
	genera	57		50			50
	species	162		165	3		165
Tabanidae (Diptera)	families	1		1			1
	genera	6		4			4
	species	13		13	3		13
Diptera	families	41	3 VM				40
	genera	248					238
	species	504					507
Terrestrial cave invertebrates	families		18 VM, 12 BG, 28 BP	83		23 VM, 13 BG, 3 BP	83
	genera	154		165			165
	species	217		218			218
Pisces	families			2			2
	genera	10		3			3
	species	11		8			8
Amphibia	families			5			5
	genera	6		9			9
	species	11		11	3		11

Reptilia	families			7			7
	genera	12		12			12
	species	15		16	5		16
Aves	families	40		43			43
	genera	100		112			112
	species	181		208	23		208
Mammalia	families	13		12			13
	genera	38		33			38
	species	58		43			58
Tatal number	families	199	45 VM,	274	9	36 VM,	350
	genera	1036	27 BG,	749	29	20 BG,	1217
	species	1811	60 BP	1332	285	34 BP	2216

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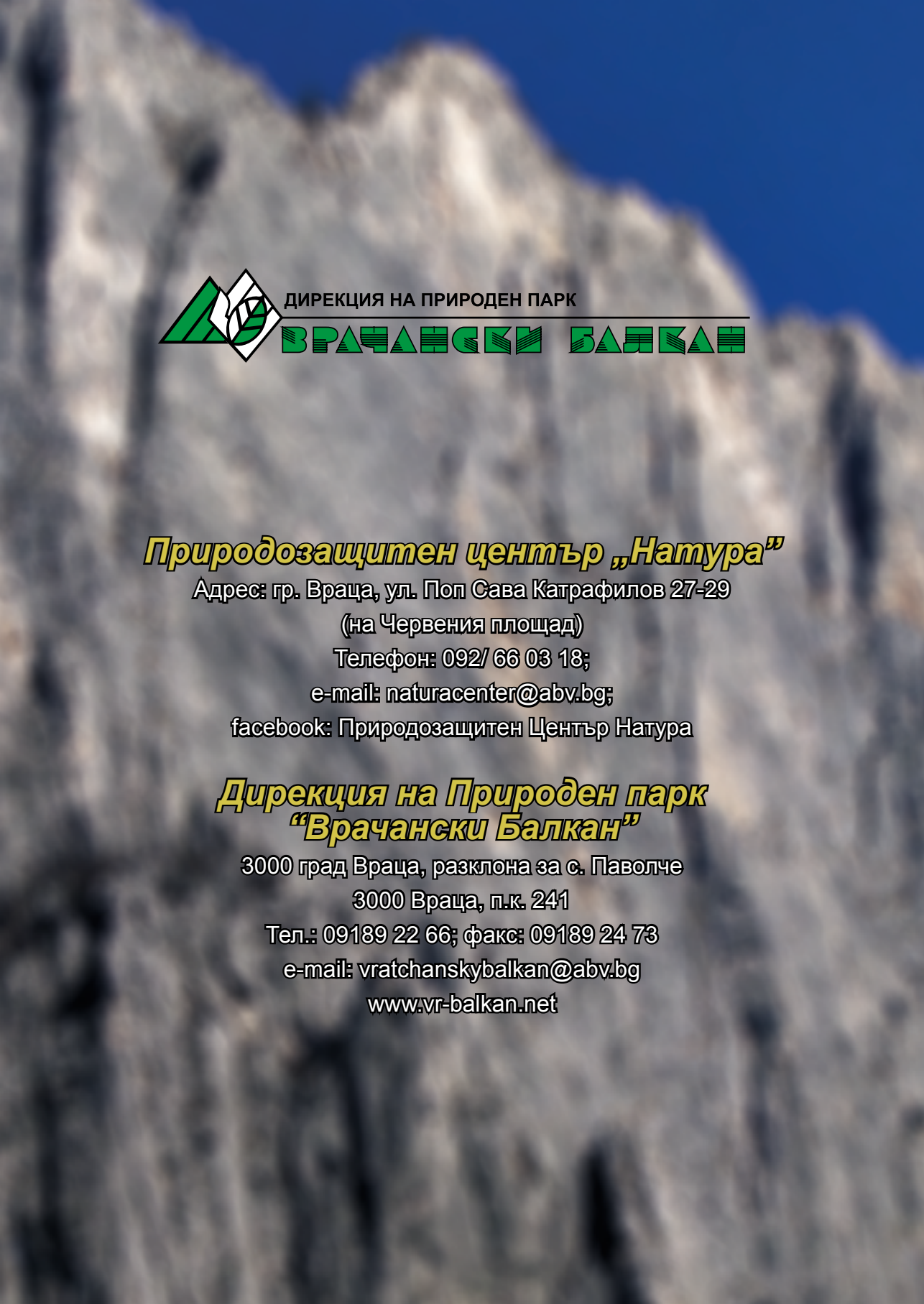
Фаунистично разнообразие на Природен парк Врачански Балкан

Димитър Бечев, Анелия Стоянова, Анелия Павлова, Иванка Попова

(Резюме)

Обобщени и сравнени са наличните данни за фауната на региона от План за управление на ПП "Врачански Балкан" и тези, включени в настоящото издание. На базата на новите данни е направен опит да се представи една по-реална оценка за броя на известните досега рецентни таксони животни.

За фауната Врачанска планина и Природен парк Врачански Балкан досега са съобщени около 2216 рецентни вида, принадлежащи към около 1217 рода и 350 семейства. Повече от 36 вида се приемат за локални ендемити за Врачанска планина, 20 – за български ендемити и 34 – за ендемити за Балканския полуостров. Точният брой ендемични видове на този етап е трудно да бъде изчислен. По-голямата част от ендемитите са пещерни видове.



ДИРЕКЦИЯ НА ПРИРОДЕН ПАРК
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