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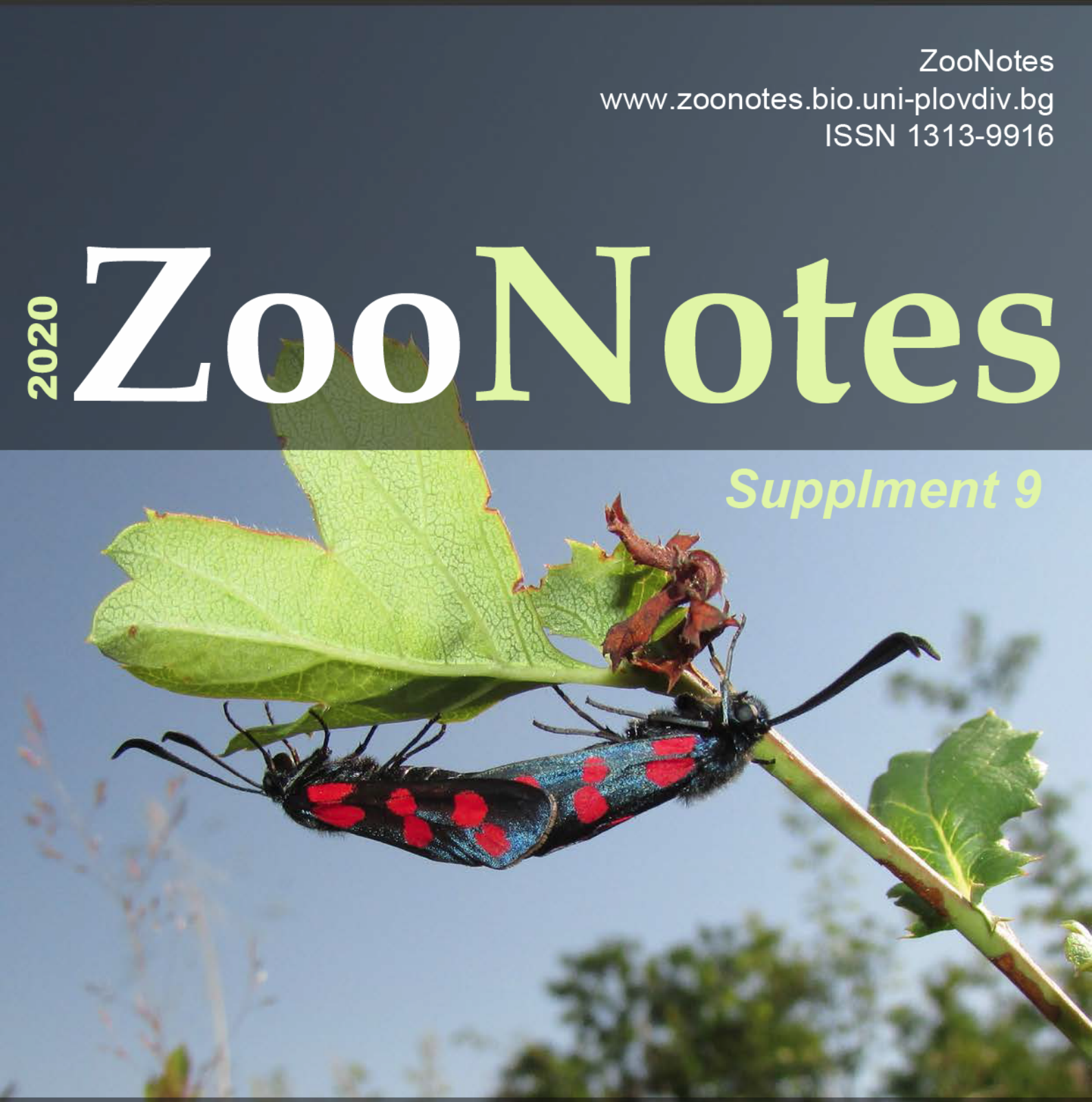

FAUNA OF SARNENA SREDNA GORA MTS

Part 1

Университетско издателство “Паисий Хилендарски”
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ZooNotes *Supplement 9*

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PART 1

Editors

Dilian Georgiev, Dimitar Bechev, Vesela Yancheva

Plovdiv University Press “Paisii Hilendarski”
Plovdiv, 2020

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Photo of the cover: *Zygaena filipendulae*
Photo: Dilian Georgiev

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Introduction

DILIAN GEORGIEV, Editor in Chief

The initiative for the faunal investigations of Sarnena Gora Mts. was provoked because of two reasons – the first one is a scientific one (there are very few studies of this area), and the second one is a personal one (I was born in Stara Zagora city and I currently live in the mountains in Hrishteni village). At the hills of Sarnena Gora (especially along the Bedechka River) my friend, Ivailo Klisurov (NGO "Green Balkans") and I grew up as naturalists and conservationists. Our "expeditions," inspired by the books of Gerald Durrel and Petar Beron were full of interesting adventures, which are still remembered with a smile.

Here I use also the opportunity to express my gratitude to all colleagues and friends who were involved in this project. It is a project without any finances and all work was paid by our enthusiasm of naturalists. Some of the team members had started later their own projects with financial supports to explore the target area. The idea grew up and many new relationships between colleagues were established.

I wish to send many thanks to the ZooNotes team: Dimitar Bechev (founder of the journal), Vesela Yancheva and Anelia Pavlova, for their constant support (again, without any payment), vital for the journal survival.

Here as a support to the faunal studies we tried to include and some data on the geology, soils, and habitats of the region.

From January 2020 ZooNotes was opened for papers about the faunistic diversity of Sarnena Gora Mts. There was no limit of 4 pages per article as it is for the regular issues. The authors were strongly advised to include also photo/s of the most fascinating or rare species in their papers.

All accepted papers are going to be published one after another, and will not be arranged in a systematic order according to the various taxonomic groups. This was done in favor of the authors in terms of fast manuscript publishing and according to technical reasons. Because of time needed for some more terrain and/or laboratory work of some of the teams we decided to publish the "Fauna of Sarnena Gora" in two parts, one in 2020 and a second at the end of 2021.

Dilian Georgiev (left) and Ivaylo Klisurov (right) in 1994 at fifteen and sixteen years of age, respectively, observing birds (photo: Simeon Marin, "Green Balkans").

Georgiev, D., Bechev, D. & Yancheva, V. (Eds.)
Fauna of Sarnena Sredna Gora Mts, Part 1
ZooNotes, Supplement 9, 2020

Geology and morphotectonics of Sredna Gora Mountains (Southern Bulgaria)

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Abstract. The tectonics of Sredna Gora Mts includes three structural complexes: Precambrian, Caledonian-Herzinian and Alpine, in which several structural levels and sub-levels are distinguished. They form the main structures of the Sredna Gora Mts: Ihtimanski anticlinorium, Srednogorie horst-anticlinorium, Bailovo-Panagyuriski synclinorium (Panagyurishte Strip) and the Stara Zagora synclinorium (Stara Zagora Strip). The geological characteristics of the Sredna Gora Mts are a result of their geological development. Some limestones and marls have been formed at the end of the Mesozoic. At the beginning of the Neozoic era (through the Paleogene), the rock layers in the region were folded. The process was accompanied by active volcanic activity, so there were formed andesite, tuffs and tuffites, which in some places created unified volcano-sedimentary complexes. At the same time, the introduction of magma into the Earth's layers led to the formation of intrusive bodies. Older rocks - granites, gneisses, mica shales, have also been discovered in the process of surface formation. After the folding process, younger sedimentary rocks and deposits were formed.

Key words: granitoids, plutons, ore deposits, gold, copper, Srednogorie structural zone.

Introduction

Sredna Gora Mountains (Mts) is part of the Srednogorie Mountain System (Srednogorie). It extends subparallel to the main chain of the Stara Planina Mountains, south of the line of the Sub-Balkan Valleys - Sofiyska, Saranska, Kamarska, Mirkovska, Zlatishko-Pirdopska, Karlovska, Kazanlashka, Tvardishka and Slivenska, and north of the Kraishte, the Rila-Rhodope massif and the Upper Thracian Lowland. The highest peak of Sredna Gora Mts is Bogdan Peak - 1604 m a.s.l. With its relatively low average altitude of only 464 m, Sredna Gora Mts refers to the low mountains (Kopralev *et al.* 2002).

Fig. 1. Sredna Gora Mountains (Source: https://bg.wikipedia.org/).

GEOLOGY

According to its geological structure, morphostructural and morphohydrographic features, the Srednogorie Mountain System is divided into four large zones: Zavalsko-Planska (also called Vitoshko Srednogorie, to which are referred to: Zavalska Planina Mt, Viskyar Mt, Lyulin Mt, Vitosha Mt and Plana Mt), Sredna Gora Mts, Bakadzhitsite Mt and Karnobatsky Hissar Mt. Particularly important are the Svetiiliyskite Vazvishenia Heights, the Manastirskite Vazvishenia Heights, the Cherny Ridge (Karatepe) and the Bosnia Ridge as "transitional" between the Srednogorie Mountain System and the Sakar-Strandzha Mountain Region.

The borders of Sredna Gora Mts, with the exception of the western one, have a clearly pronounced morphostructural and morphological character. In this sense, the western boundary, the Pancharevo Gorge (between Plana Mountain and Lozenska Mountain), is conditional, but it is well known and is officially accepted. The eastern boundary is delineated by the Tundzha River, which, entering the Sliven Valley, sharply changes direction and turns south, tearing off the Bakadzhitsite Mt to the east. The northern boundary is marked by the relatively steep end of the Sredna gora Mts slopes to the Sub-Balkan valley fields and has an almost straight outline, unlike the southern one, which has a complex pattern. To the west, the southern boundary is faulty, but Sredna Gora Mts is tightly squeezed into the Rila Mts, and to the east, the border is a "ruffled" erosion line, along which Upper Thracian Lowland enters with some large "bays" in the mountain (Kopralev *et al.* 2002).

Fig. 2. Location of Sredna Gora Mountains.

Within the boundaries described, Sredna Gora Mts has a straight (aerial) length of 256 km and a width of 40-50 km (in the western part) to 3 km (in the easternmost). It is the third longest in Bulgaria after the Stara Planina Mts and the Sub-Balkans Range. Its area is approximately 6000 km^2, which is about 6% of the country's territory. In addition to the west, where Sredna Gora Mts connects to the mountains of Kraishte structural zone, a series of transverse ridges also connect it to the Stara Planina Mts. Such a connection, though less distinct, is also to the south with the Rila Mts, Rhodope Mts, Sakar Mts and Strandzha Mts. From the west to the east, the transverse thresholds of Negushevsky Ridge, Gulabets Ridge, Koznitsa Ridge, Strazhata Ridge (Krustets) and Mezhdenika Ridge connect Sredna Gora Mts with Stara Planina Mts. Particularly expressive in orographic terms is this connection through the Gulabets Ridge, the Koznitsa Ridge and the Strazhata Ridge (Kopralev *et al.* 2002).

The Shipochansky Ridge and the Schumnatitsa Ridge make the connection between Cherni Ridge from the Ihtimanska Sredna Gora Mts and the Rila Mts in the south. A little to the east, such a connection is made between Golak Ridge (Ihtimanska Sredna Gora Mts) and the transverse ridge Rakovitsa. Further to the east, the Chirpanskite Vazvishenia Hights, elevated to the south in Thracian Lowland, by a wide footstep had a direct connection with the eastern Rhodopes' ridges Dragoina and Mechkovets. This connection, although deeply eroded and torn apart by the Maritza River, also has a clear morphological appearance (Kopralev *et al.* 2002).

Morphotectonic zonation of Bulgaria

The evolution of the ideas concerning morphotectonic zonation of Bulgaria and geomorphological zonation as derived from it, is very well discussed in the review of Zagorchev (2009). As the author emphasizes, the morphotectonics has played an important role in the evolution of geotectonic. Even at the first geological observations, explorers have found out some direct relations between the relief and tectonics, and specifically, between the young fold belts and the mountain chains. So, the first tectonic syntheses have a morphotectonic character as far as they reflect the relationship of the tectonic structure to its surface – a geomorphological expression.

The first tectonic zonation of Bulgaria and the Balkans was published by Cvijic (1904). It represented a morphotectonic zonation based upon five large tectonic and morphological elements: the Bulgarian (later called Moesian) plate (platform), the Carpathian system (mountain range), the Balkan system (mountain range), the Transitional zone and the Rhodope mass. All later morphotectonic (Bonchev 1946, 1971), geomorphological (Galabov 1946) and neotectonic (Tzankov *et al.* 1998) maps are based on this fundamental distinction as stated by Zagorchev (2009).

The differentiation between geomorphological and morphotectonic zonation of Bulgaria has been proposed by J. Galabov and E. Bonchev in 1946 (Zagorchev 2009). Almost 25 years later, Bonchev (1971) introduced two other basic concepts in the morphotectonic zonation: 1) the lineaments and lineament-geosynclinal zones related to deep faulting, and 2) the transversal crypto-lineaments that divide the country into three megablocs: Western, Central and Eastern. Next big step in the evolution of ideas concerning the geotectonic zonation was made by Boyanov *et al.* (1989) and Dabovski *et al.* (2002) which introduced the plate tectonics postulates. These authors implemented also the idea about the consecutive superposition of several Alpine orogens to form the complex Alpine orogenic edifice on the Balkan Peninsula: Late Triassic (Early Cimmerian), Middle Jurassic (Late Cimmerian), Mid Cretaceous (Austrian), Late Cretaceous (Subhercynian and Laramide), Middle Eocene (Illyrian), Late Eocene - Oligocene (Pyrenean) and latest Oligocene - earliest Miocene (Savian). As a result of their studies, the maps produced have a purely geotectonic and geodynamic character, but they have lost almost all links to the geomorphological and morphotectonic zonation (Zagorchev 2009).

In the present structural terms, the morphotectonic picture of Bulgaria is entirely subordinated to the structures of the Alps-Himalayan orogeny. With the emergence of this complex geotectonic structure, the main morphotectonic units in Bulgaria are formed. They differ not only in morphology and tectonic style, but also in the character of the sedimentary, magmatic and metamorphic rocks that build them. The differences are related to the different fate of these areas during the long evolution of our geological space.

The Bulgarian continental microplate is disposed in eastern part of the Balkan Peninsula (South East Europe). The last one covers the territories to the east from the Timok River, South Morava, Pchinya and Vardar River. It includes the territories of Bulgaria and parts

from East Serbia, the eastern part of the Republic of Macedonia, the North-East Greece and the North-West Turkey.

According to Tzankov *et al.* (2018), the territory of Bulgaria, as a part from the Balkan Peninsula, is composed by numerous micro morphotextures (Fig. 3). Those continental microplates were separated from the northern passive paleo margin the Gondwana Continent in different moments of the Phanerozoic evolution. Authors explain their movement to the north during the closing of the Tethys Ocean as islands or archipelagos with different geological and tectonic history. These continental fragments were arrived to the south and south west margin of the Paleo-Europe continental massif in the time of the ending of the Tethys oceanic crust subduction (Early Paleogene) where they built the modern southwestern and southern margin of the European continent – Neo Europe. The Neo Europe uniform geotectonic evolution was begun in Early Paleogene but the last more important deformations on the Balkan Peninsula were realized during the Paleocene and Eocene Epochs and the Early Oligocene Age. Main Alpidian tectonic processes were related to deep crust folding and over thrusting deformations, revealing to the end of the Alpidian geotectonic era. The Paleocene-Early Oligocene predominantly low or hill-low mountain relief in the region was connected with intensive volcanic activity (Tzankov *et al.* 2018). That is the reason for the presence of the contemporary mosaic pattern of continental crust (25 microplates) in the southeastern parts of Neo Europe as presented on Fig. 3. Tzankov *et al.* (2018) conceived that the oriental part of the Balkan Peninsula includes the Bulgarian, Halkidikian and southern part from Moesian continental microplates.

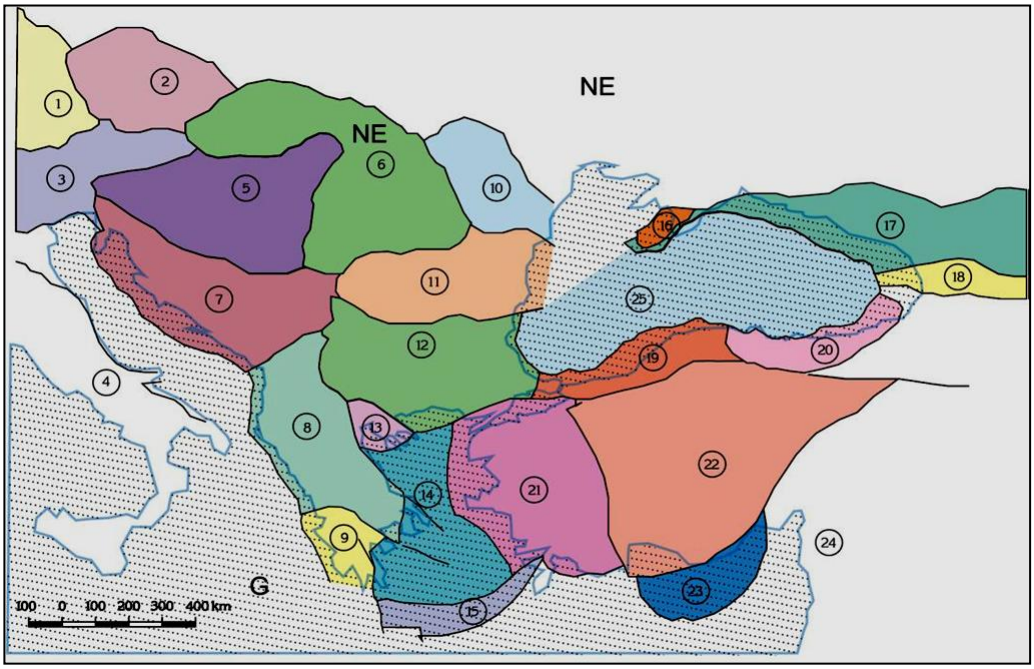

Fig. 3. Mosaic tectonic pattern schematic model of the Neo Europe South-eastern part (after Tzankov and Iliev, 2015, with modification and addition) (Source: Tzankov *et al.*, 2018). G- Gondwana continental macroplate (Continent); NE - Neo Europe continental macroplate. 1-20 - Neo Europe continental microplates: 1-Bavarian, 2-Bohemian, 3-Alpean, 4-Apeninian, 5-Moravian, 6-Carpathian, 7-Dinarian, 8-Pindian, 9-Heladian, 10-Scitian, 11-Moesian, 12-Bulgarian, 13-Halkidikian, 14-Aegean, 15-Cretean, 16-West Pontian, 17-East Pontian 18-West Anadolian, 19-East Anadolian, 20-Cyprian; 21-23, Paleo Europe Continental Microplates: 21-Creamean, 22-Caucasian, 23-Georgian; 24-Arabian Continental Plate; 25, Black Sea Oceanic Microplate.

The Bulgarian continental microplate is composed by the Sub Balkan, Upper Thracian, Strumeshnitsa, Middle Struma, Middle Mesta, West Thracian, Lower Thracian, South Morava, Hemus, Kraishte-Sredna gora, Bregalnitsa, Rila-Rhodope, Sakar-Strandzha and Gradesh-Belasitsa morphostructural zones (Tzankov *et al.* 2018) (Fig. 4).

The Balkanides occupy the central part of the Bulgarian lands. To the south they are bounded by the Marishka Fault and to the north by the Brestnitsa-Preslav Flexure. To the west, they continue to eastern Serbia, and to the east they reach the Black Sea shelf, in whose boundaries they turn south and connect with the Pontids. The rocks that are revealed in their range can be conditionally combined into three structural complexes: lower, middle and upper (Strashimirov & Moev 1988).

The lower structural complex lies in the core of the large positive structures located in the southern reaches of the Balkanides. It is made of high-metamorphic rocks and granitoids with a revealed thickness up to 4 km. It is genetically and spatially linked to the upper part of the Pra-Rhodope complex.

The middle structural complex is revealed most fully in the core of the anticlinoric structures from the central parts of the Balkanides and Strandzha Mountains. Its distribution clearly marks the direction of the Paleobalkanides. It is made of low-metamorphic and diverse sedimentary rocks which make a typical formational order for geosynclinals areas: diabasic-phyllitoid and aspidic (clay) formation of the Early Paleozoic age (Cambrian, Ordovician, Silurian), terrigenous-carbonate and flysch formation of the Devonian and Early Carboniferous and molasses of Carboniferous and Permian ages (bottom-up direction). The total thickness of the complex is about 8 km. The Plutonites of Stara Planina are implemented in the middle structural complex. In this regard, its lower parts are affected not only by regional but also by contact metamorphosis (Strashimirov & Moev 1988).

The upper structural complex is revealed very widely, but in the most complete sections it is preserved in the northern areas of the Balkanides (Pre-Balkan). It covers the Mesozoic and Neozoic groups. It is made of various marine and continental sedimentary rocks. The upper Cretaceous rocks in the southern parts of the Balkanides have specific composition and construction. Upon closer examination, they are clustered into a separate structural complex, characteristic only of the Srednogorie structural zone. In the upper structural complex there are many disagreements and peculiarities that allow it to be broken down into a whole series of structural series and sub-series. Usually they are not sustained over the entire area of the Balkanides and their occurrence is conditioned by the specific behavior of the individual earthquake blocks. Unlike other structural complexes, the upper structural complex constructs the mantles of anticlinoric and entire synclinoric structures. Its thickness varies widely and in some sections exceeds 6 km (Strashimirov & Moev 1988).

Geomorphological zonation of Bulgaria

The geomorphological zonation of Bulgaria also derived from the original morphotectonic zonation of Cvijic (1904), as have discussed by Zagorchev (2009). The most popular geomorphological zonation was proposed by Galabov (1946). He distinguished four morphological regions on the Bulgarian territory: I. Danubian hilly plain; II. Stara Planina zone (IIa. Foothills of Stara Planina (Forebalkan, Pre-balkan), and IIb. Main Stara Planina chain); III. Transitional strip (zone) (IIIa. Sredna Gora with the Cis-Balkan basins (IIIb), the Kraishte (IIIc) and the Thracian plain (IIId)); IV. Rila-Rhodope massif (Rhodopes (IVa), Rila (IVb), Pirin (IVc), Osogovo-Maleshevo Mountains (IVe) and the Sakar-Strandzha Mountains (IVf)). Alternative zonation was proposed by Gerasimov (1957), based on the morphological regions of Galabov (1946) and the geostructural elements of E. Bonchev (1946).

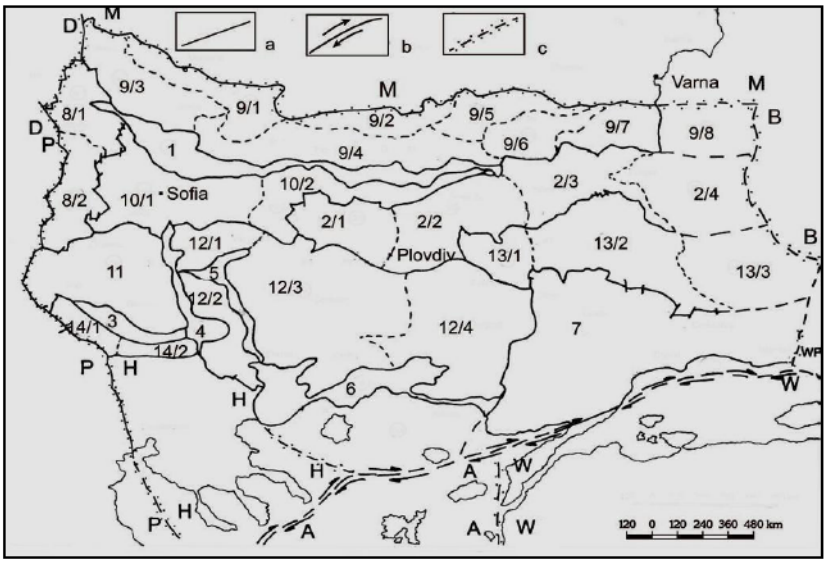

Fig. 4. Bulgarian continental microplate (zones and areas) (after Tzankov et al., 2018)
1- Sub Balkan, 2- Upper Thracian (2.1- Plovdiv, 2.2- Zagore, 2.3- Burgas), 3- Strumeshnitsa, 4- Middle Struma, 5- Middle Mesta, 6- West Thracian, 7- Lower Thracian, 8- South Morava (8.1- Nishava, 8.2- Surdulitsa), 9- Hemus (9.1- Vratsa, 9.2- Veliko Tarnovo, 9.3- Preslav, 9.4- Midzhur, 9.5- Mazalat, 9.6- Udvoy-Matoria, 9.7- Primorsko), 10- Kraishte-Sredna gora (10.1- Kraishte, 10.2- Sredna gora), 11- Bregalnitsa, 12 - Rila-Rhodope (12.1- Rila, 12.2- Pirin, 12.3- West Rhodope, 12.4- East Rhodope), 13- Sakar-Strandzha (13.1- Sakar, 13.2- Strandzha), 14- Gradesh-Belasitsa (14.1- Gradesh, 14.2- Belasitsa).

The geomorphological zonation of Bulgaria has been further developed by Galabov (1982) and Kopralev *et al.* (2002). Authors accept as a base the morphostructural analysis of the relief, the principal stages in the geologic evolution, the planation surfaces, the valley network and terrace spectra, loess, karst relief and the Black Sea shelf, similarly to the findings of Zagorchev (2009). The proposed zonation includes four big geomorphological regions which coincide with the principal morphographic regions (Fig. 5).

Zagorchev (2009) emphasizes also that that the Neogene evolution and the development of the relief are controlled mostly by vertical tectonic movements in extension conditions, so the geomorphological regions and subregions are closely related to the young tectonic evolution. Par example, some geomorphological and neotectonic studies in Bulgaria and on the Balkan Peninsula demonstrated that the planation surfaces (the initial peneplain formed in Early Miocene to early Middle Miocene times, and subsequent younger surfaces) in the mountain horsts show a step-wise distribution, and their altitude is dependent on the amount of uplift posterior to their formation (Zagorchev 1992, 2009). In some cases, it is possible to correlate some of the surfaces with corresponding stagnation levels in the neighbor sedimentary basins. Alternatively, destruction of some surfaces during intense uplift and erosion is correlated with very coarse sediments (megabreccia, coarse conglomerate) that form fans within adjacent grabens, some of which are buried by younger sediments (Zagorchev 2009).

Fig. 5. Map of the geomorphological zonation of Bulgaria (according to Kopralev *et al.* 2002; redrawn in color by Zagorchev 2009) (Source: Zagorchev 2009).
A – Region of Moesian (Danube) plain: Ab – Subregion of Pleven-Pavlikeni; Ac – Ludogorie-Dobrudzha Subregion (Ac1 – Ludogorie-Dobrudzha plateau; Ac2 – Shumen-Provadiya plateau; Ac3 – Peri-Black Sea low plateau and lowlands; Ac4 – Danube low plateau and lowlands); B – Stara Planina Region: Ba – Subregion of Pincipal Stara Planina Range; Bb – Fore-Balkan Subregion (Bb1 – Belogradchik-Veslets hilly area; Bb2 – Teteven-Elena hilly area; Bb3 – Preslav-Gerlovo hilly area); C – Kraishte-Sredna Gora Region: Ca – Kraishte-West Srednogorie Subregion (Ca1 – Kraishte area; Ca2 – West Srednogorie area); Cb1 and Cb2 – Sredna Gora range; Cc1 – Sofia basin; Cc2 – Cis-Balkan basins; Cd – Upper Trace-Middle Tundzha Subregion (Cd1 – Plovdiv and Stara Zagora basins; Cd2 – Middle Tundzha lowland and hilly area; Cd3 – Burgas lowland); Ce – Sakar-Strandzha Subregion (Ce1 – Sakar area; Ce2 – Strandzha area); D – Macedonian-Rhodope Region: Db – Subregion of Osogovo-Belasitsa (Db1 – Osogovo-Ograzhden mountain area; Db2 – Struma graben area); Dc – Subregion of Rila, Pirin and Mesta basins (Dc1 – Rila-Pirin high mountain area; Dc2 – Mesta graben area); Dd – East Rhodope Subregion (Dd1 – Middle Arda hilly area; Dd2 – Maglenitsa hilly area; Dd3 – Haskovo low mountain step).

Morphotectonic zonation of Sredna Gora Mts

The tectonics of Sredna Gora Mts are closely related to the Srednogorie structural zone, which has a long and complex geo-historical development. The ideas about the place of the Sredna Gora Mts in the tectonic scheme of Bulgaria, its relative independence or belonging to one or another tectonic zone also undergo a long and complex evolution.

Considering the first tectonic division that was made by the Serbian geomorphologist Cvijic in 1904, the unfinished scientific debate has been going on for more than a century. According to some researchers and authors, the Srednogorie zone belong to the Rhodope Massif (Rila-Rhodope Massif, Macedonia-Rhodope Massif) and, according to others, to the Balkanides or the Alpine folded system. Researchers who distinguish it as a separate tectonic unit are no exception. Among the last are the great Bulgarian geologists Acad. J. Galabov and Acad. E. Bonchev. Either way, the dispute continues. So far, the only undisputed thing is that Sredna Gora Mountain is part of the Srednogorie structural zone.
The boundaries of the Srednogorie structural zone are determined by the Marishky and Pernik rifts in the south and Sub-Balkan rift in the north. To the west and east, the zone continues beyond the borders of Bulgaria. Within this range, specific cretaceous rocks with a volcanic-sedimentary character and a thickness of 1 to 5 km have been developed. For these reasons, it is also known as the Central Bulgarian Volcanic Belt. It originated on a

heterogeneous basis and slightly oblique to the Paleobalkanides and Mesobalkanides. On the upper Cretaceous complex are deposited thick molassoid sediments, which are located in separate depressions and grabs. Because of its specific construction, many authors have tried to view it separately from the Balkanides, such as a separate geosyncline space, called the tafrogeosyncline, the lineament-geosyncline, the continental rift, etc. Such a solution encounters serious difficulties in interpreting the neotectonic development of Balkanides and the Plate-tectonic reconstructions of our lands (Strashimirov & Moev 1988).

According to Tzankov *et al.* (2019), the origin of the Sredna Gora morphostructural area should be referred to the Late Pleistocene-Holocene, after the full destruction of the post Early Pleistocene orthoplain. The authors revealed that the new build positive morphostructures belong to one older Late Pleistocene generation and one younger Late Pleistocene-Holocene generation. The first one is presented today through the more or less partial conserved traces of the eroded morphounits. The second generation morphostructures build the modern complete regional morphostructural plan of the area (Tzankov *et al.* 2019).

According to Tzankov *et al.* (2019), the geodynamic genesis of the Sredna Gora morphostructural zone is connected with the Early Paleogene saturation between the Moesian and Balkan Continental Microplate during the building of New Europe Continental massif. The morphotectonic position of the Sredna Gora morphostructural zone corresponds with the first-order regional morphostructural threshold – the Srednogorie Threshold. It separates the Tsaribrod-Tvarditsa Complex morphostructural passage (Sub Balkan morphostructural zone) from the Thracia Complex morphostructural passage (Upper Thracian morphostructural zone) between Iskar River and Tundzha River (Fig.6).

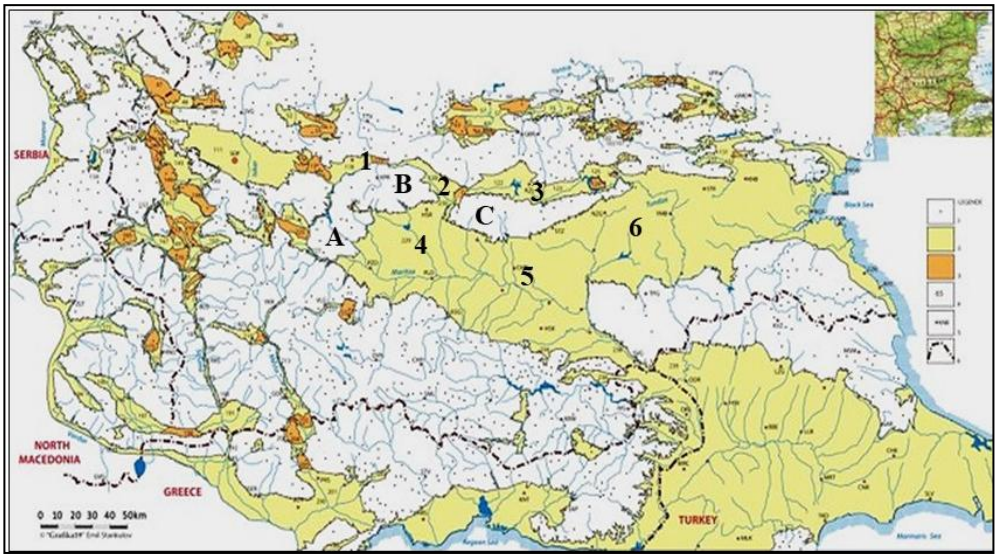

Fig. 6. Morphotectonic position of the Sredna Gora morphostructural area in the east part of the Balkan Peninsula (Source: Tzankov *et al.* 2019).
1-3-east part of the Tsaribrod-Tvarditsa Complex morphostructural passage (Sub Balkan morphostructural zone): 1-Zlatitsa Valley morphostructure; 2-Karlovo Valley morphostructure; 3 -Kazanlak Valley morphostructure; 4-6-west part of the Thracia Complex morphostructural passage (Upper Thracian morphostructural zone): 4-Plovdiv Lowland morphostructure; 5-Spassovo morphostructural threshold; 6-Zagore Lowland morphostructure; A-Eledzhik Morphostructural Region (Babuhnitsa-Vitosha morphostructural area); B-C-Sredna Gora morphostructural area: B - Panagyurishte and Hisarya Morphostructural Regions, C-Sarnena Sredna Gora Morphostructural Region.

In the transitional direction, the Srednogorie structural zone is divided into Western, Central and Eastern zone (Strashimirov & Moev 1988).

Western Srednogorie zone is also known as Sofiysko Srednogorie. The Etropole diagonal crypto-fault is considered to be its eastern border. To the east, the Upper Cretaceous complex is buried by the Paleogene sedimentary rocks of the Pernishki graben and the Pliocene deposits of the Sofiyski graben. Between them remains highly elevated Vitosha central-magmatogenic structure (Strashimirov & Moev 1988).

Central Srednogorie zone covers the lands between the Etropole crypto-fault and the Tvardishki strait. It develops several positive and negative structures, which were formed during the late Alpine structure. In the western part of the Central Srednogorie zone is the Ihtimanski horst block, built mainly by the high-metamorphic rocks of the lower structural complex. It is surrounded by grabens with different size and time of formation. In the northern part of the Central Srednogorie zone is the Srednogorie horst anticlinorium, which in orographic terms encompasses Sashtinska and Surnena Sredna Gora. At its core are revealed the high-metamorphic rocks of the Balkanides' lower structural complex, which are strongly fragmented and assimilated by granitoid intrusions. Immediately south of the Srednogorie anticlinorium are the Bailovo-Panagyurishte and the Stara Zagora structural strip. They are long and narrow syncline structures that are composed of intricately folded and dislocated Triassic, Jurassic and mainly Upper Cretaceous rocks. The southern part of the Central Srednogorie zone is occupied by the Upper Thracian complex trench. Its borders include the Plovdivski graben and Zagorski graben, and the Chirpanski threshold separating them. The grabens are filled with Paleogene, Neogene and Quaternary deposits. Relatively smaller ridges have developed along the boundary faults of the structural zone, which are filled mainly with Pliocene and Quaternary sediments. There are the Zlatitsa, Karlovski, Sheinovski and Kazanlashki grabens to the north, and the Palakariyski, Kostenetski, Uzundzhovski grabens to the south (Strashimirov & Moev 1988).

Eastern Srednogorie zone comprises two first-class structures: the Strandzha anticlinorium and the Burgas synclinorium. Some authors view these structures as separate zones or sub-zones (Strashimirov & Moev 1988). The Strandzha anticlinorium begins east of the Zagora graben and continues east-southeast in Turkey. In the modern structural plan there are clearly several second-order fold structures, of which the Central Strandzha anticlinorium is the most expressed. Of the syncline structures, the most significant sizes have Stoilovski and Topolovgradski synclinorium. The Burgas synclinorium begins in the region of Nova Zagora, expanding and deepening in the east. To the south it reaches the North Strandzha flexure, and to the north - to the Aytos anticlinorium. It is filled with a variety of sedimentary, volcanic and intrusive rocks of Early Cretaceous, Paleogene and Neogene age (Strashimirov & Moev 1988).

Fault tectonics determines the block-mosaic structure of the Sredna Gora Mts, especially pronounced in the Ihtimanska Sredna Gora Mts, and play an important role in its neotectonic geomorphological development when shaping the actual landscape.

Geological characteristics of Sredna Gora Mts

Sredna Gora Mts includes rocks and rock complexes of different types, composition and age. Almost all major rock species are represented here: magmatic - plutonic (intrusive) and volcanic, sedimentary, metamorphic. Their age spans a huge range, from the Precambrian to the Quaternary, i.e. more than 2 billion years. The oldest rocks that are now being discovered in Sredna Gora Mts are metamorphic (various types of gneisses, schists, gneiss-schists, etc.) and have a Precambrian age. They, together with the slightly younger (Paleozoic) granitoids, make up about 75% of the Sredna Gora Mountains and play a major role in its geological features (Valev & Filipov 1983).

Granitoids (granites, granodiorites, gabbro, etc.) make plutons of varying size (rocks whose magma, unlike volcanic rocks, has stuck in the Earth's interior, subsequently discovered by denudation processes). The more famous such plutons in Sredna Gora are: Vershilski, Gutsalski and Boshulski plutons (Ihtimanska Sredna Gora Mts) (Dabovski *et al.* 1965; Georgiev *et al.* 2009), Poibrenski, Panagyuriski, Koprivshtenski, Hisarski plutons (Panagyurska Sredna Gora Mts) (Valchev & Nikolova 2017), Bratanski, Pustrovski, Zmeyovski plutons (Sarnena Sredna Gora Mts) (Valev & Filipov 1983).

The Mesozoic and Neozoic sedimentary rocks (various types of limestone, dolomites, marls, sandstones, conglomerates, etc.) are also widespread and play important role in the geological structure of the Sredna Gora Mts. Essential for the geomorphology are also volcanic and volcano-sedimentary rocks - andesite, andesite lava breccia, tuffs - the result of intense underwater volcanism which occurred during the Upper Cretaceous especially intense in Panagyurska Sredna Gora Mts and Sarnena Sredna Gora Mts (Fig. 7) (Vangelov *et al.* 2019).

The Pliocene is relatively widespread in the southern parts of the Sarnena Sredna Gora Mts where is represented by lake-type sediments. There are two main facies that differ horizontally. One of them is external, coastal, consisted of coarser gravels and boulders. The other one is an internal, comparatively finer, made up of clayey-sandy sediments. The transition between the two facies is gradual, and the differences in the size of the material are due to the dynamic environment during their formation (Valev & Filipov 1983).

The Quaternary in the Sarnena Sredna Gora Mts is represented by Pleistocene, Holocene and other genetic types of Quaternary deposits. To the Pleistocene are related the coarse sedimentary materials of some deluvial cones northeast of the village of Rozovets, as well as the gravel-boulder deposits around the village of Chehlare, Turiya, Gorno Novo selo. The Holocene is widespread mainly in the valleys of almost all larger and smaller rivers. the materials that build it are developed in boulder-gravel and sandy-gravel facies, without any particular differentiation (Valev & Filipov 1983).

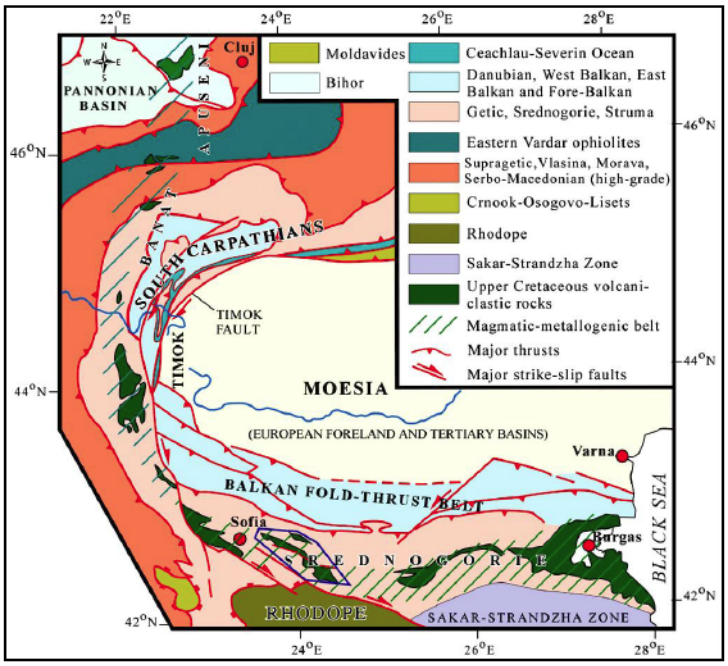

Fig. 7. Regional sketch map of the Apuseni-Banat-Timok-Srednogorie magmatic and metalogenic belt (after Knaak *et al.*, 2016, modified by Vangelov *et al.* 2019) (Source: Vangelov *et al.* 2019).

Stratigraphy of Sredna Gora Mts

Sredna Gora Mts is a small fragment of the giant Rhodope Massif, the oldest "land" and an indisputable morphological core in the Balkans. Many studies have proved that Sredna Gora zone is a part of a complex, elongated Late Cretaceous-Tertiary magmatic arc that can be traced from the Apuseni Mountains in Romania to Iran (Bergougnan & Fourquin 1980, Sandulescu 1984, Mitchell 1996, Jankovic 1977, 1997, Berza *et al.* 1998, Stampfli & Mosar 1999, Neubauer, 2002). According to some authors, this zone could be regarded as a volcanic island arc (Boccaletti *et al.* 1974, 1978), back-arc basin (Hsu *et al.* 1977) or intra-arc basin with submarine volcanism (Nachev 1978), or even as an intracontinental rift, which originated in connection with the Vardar subduction (Dabovski 1980). Widespread in the Sredna Gora zone are intrusive and volcanic rocks, the products of Upper Cretaceous magmatic activity (Georgiev *et al.* 2009).

During the Paleozoic (about 300 million years ago), this protomorphostructure (over 2-3 billion years old) begins to disjoint and disintegrate. From then until the Upper Cretaceous-Paleogene stage (60-70 million years ago), the area of present-day Sredna Gora Mts is an arena for the introduction of granitoid plutons (Upper Paleozoic and Upper Cretaceous), supplemented by contact metamorphic changes, long-standing regional metamorphism, multiple transgressions (invasion of sea basins), underwater volcanism and emersion - "floating" over the waters and intense destruction (Strashimirov & Moev 1988).

The Upper Cretaceous sedimentary successions in the western part of the Central Srednogorie tectonic subzone crop out in the so called Chelopech and Panagyurishte strips (Fig. 8). As a whole, both strips show similar structure and composition: basal siliciclastic sediments, an interval including magmatic rocks, followed by a volcaniclastic and epiclastic deposits, covered by white, red and green limestones (regionally developed in peri-Tethyan realm facies), with fast transition to sandy low-density turbidities. The crystalline basement of the Srednogorie zone consists of Cadomian and Palaeozoic high-grade metamorphic rocks intruded by granitoids with different age, whereas, in the southern slopes of the Stara Planina Mts (along the northern rim of the Chelopech strip), mostly lower Palaeozoic low-grade metasediments are exposed (Iliev & Katskov 1990, Velichkova *et al.* 2004).

Permian and Triassic clastic and carbonate rocks are locally preserved in both strips (Antonov *et al.* 2010). The findings of Tzankov (1961), Iliev & Katskov (1990) revealed that Carboniferous, Permian, Triassic and Jurassic rocks in the western part of the Panagyurishte strip are also part of the pre-Upper Cretaceous basement (Fig. 8). The heterogeneity of the basement lithology is a result of the intensive Early Alpine orogeny, during which different levels of exhumation and erosion were achieved, the most prominent being those in the Central Srednogorie tectonic subzone, as summarized by (Vangelov *et al.* 2019).

The Upper Cretaceous stratigraphy in the Eastern Sredna Gora zone is based mainly on the results of the systematical field descriptions (cited above) as well as on the studies of microfaunistic associations (Petrova *et al.* 1980, Nachev & Dimitrova 1995). In the Eastern Sredna Gora zone there is Lower Cenomanian conglomerates, calcareous-sandy, siltstone, quartzite-sandstone, and sandy-limestone horizon, Turonian basal conglomerate-sandstone, shale, coal, supra-coal horizons and flysch-like series as well as Maastrichtian basal breccia-conglomerate, tuffic-volcanogenic, marl-limestone with tuffs, volcanogenic and limestone horizons (Tzankov *et al.* 1962, Tzankov 1968).

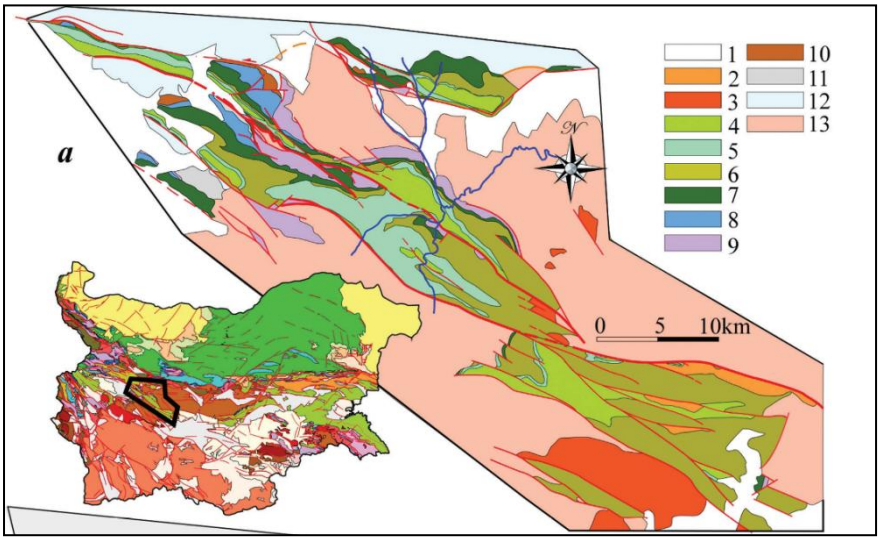

Fig. 8. Geological sketch map of the studied area (modified from Iliev & Katskov 1990, and Antonov *et al.* 2010, modified by Vangelov et al., 2019) (Source: Vangelov *et al.* 2019)
1 – Neogene–Quaternary; 2 – Paleocene; 3 – Upper Cretaceous plutons; 4 – Chugovitsa Formation; 5 – Mirkovo Formation; 6 – volcano-terrigenous complex; 7 – basal terrigenous unit; 8 – Jurassic; 9 – Triassic; 10 – Permian; 11 – Upper Carboniferous; 12 – Paleozoic low-grade metamorphites; 13 – Paleozoic high-grade metamorphites.

Gradishte Formation occurs as a stripe to the west of Sliven Town with a height of 90 m up to 130 m. The rocks of the Formation lie with a transition (sub flysch) over black shales, calcareous shales and argillaceous limestones of the Cerovska Formation (Petrova et al., 1980). Fossils in Gradishte Formation are extremely rare and represented by *Globotruncana linneiana* (d'Orbigny), *Hedbergella* sp., Heterohelicidae and *Lenticulina* sp. (Nachev & Dimitrova 1995). The age of the formation is considered as Coniacian-Campanian (conditionally). A part of the flysch provisionally is referred to the Turonian (Tzankov 1968, Kunchev 1971, Kulaksazov 1974).

Glushnik Formation is named after the Glushnik Village, located at 15 km east of the town of Sliven. The thickness of the rocks there is rising from 10 m up to 200 m (Nachev & Dimitrova 1995). The features of the Glusnik Formation are related to the presence of grey up to reddish micritic and argillaceous limestones which are partly ironized. They contain also silicate concretions, bedded quartz (jasper) and manganese ores. As described by Nachev & Dimitrova (1995), the rocks of the Glushnik Formation lie over the Sinemorec Formation with a sharp contact, locally with a submarine erosion. Fossils of Glushnik Formation are presented mainly by planktonic foraminifers and microfossil associations. The following taxa have been determined: *Globotruncana tricarinata* (Quereau), *Globotruncana bulloides* Vogler, *Contusotruncana fornicate* (Plummer), *Rugoglobigerina rugosa* (Plummer) and *Pseudotextularia elegans* (Rzehak). The age of the Glushnik Formation is Campanian (Nachev & Dimitrova 1995).

During the Paleogene, Sredna Gora Mts begins to "float", rising above the surrounding water basins (seas). And then one of the most important geotectonic events happens - huge masses gravitationally slip into the Paleogene Sea to the north, from where the Stara Planina Mts was born. The Central Balkan uplift is formed and whose fragment, the Botevvrashka part, is a classic example in the tectonics of the Balkans. The highest peaks of the Kalofer Mts are made of allochthonous (alien) rocks, ie. from Srednogorie granitoids (Strashimirov & Moev 1988).

Mineral and ore deposits

Sredna Gora Mts can be described as rich in minerals and ore deposits. The most famous one is the Panagyurishte ore region, whose copper deposits are noted in the world copper almanac. In addition to the well-known deposits, there are dozens of indications of various ore, non-metallic and other minerals that have been found in Sredna Gora Mts. There were also deposits of polymetallic minerals, manganese, titanium-manganese, manganese-iron, hematite ores, molybdenum, and especially gold-containing ores. Many of them were subject to extraction and production in the distant past, when the ancient miners have followed their amazing talent and have shown excellent knowledge.

The history of gold mining in Bulgaria, the Balkans and Europe is closely related to Sredna Gora Mts. Information about the prehistoric and antique ore production in Bulgaria, and more precisely, in the Srednogorie Region, can be found in a number of publications (Skorpil 1882, 1884, 1888, Karaoglanov 1924, Radoslavov 1934, Peev 1975, 1980, 1990, Georgiev 1978, 1987, Cernykh & Raduncheva 1972, Cernykh 1978, Kovachev 1994, Nenov 1994, 1997, Nenov & Nenov 2008a, b, Avdev 2005). Another data on mining activities in the region are given in the notes of many travelers, in chroniques and historical documents (Nenov 2008). The study of Cernykh (1978) has proved that the oldest copper mines in Europe have been located in Sarnena Sredna Gora Mts. Traces of them can be found near the villages of Hrishteni and Rakititsa, the village of Mineral Baths, in the area "Mechi Kladenets" ("Ai Bunar"), "Tumyanka" and other places in the Stara Zagora Region. Their age could be attributed to the Chalcolithic period (5000-4000 BC). The copper ores in the region have been with high gold content – only in the "Mechi Kladenets" area it has been estimated that over 300 kg of gold have been produced (Cernykh 1978). There was found an evidence for the application of "fire" method in ore production which age is about one hundred years before the same practice in the Pyrenean Peninsula (Avdev 2005).

Another significant evidence for the ancient ore production in Sarnena Sredna Gora Mts is the unique archaeological monument "Kutela" (the "Mortar") at the Southern slope of Bratan Peak (Fig. 9). It has been modelled from a granite block with thickness of the walls 0.40 m, depth 1.00 m, inside diameter from top to bottom 1.30-0.50 m, outside perimeter 4.30 m, and with two stone "handles" of 0.55 x 0.25 x 0.15 m. As Nenov (1997) emphasizes, its close location to gold and gold-bearing occurrences and deposits is remarkable - only around the mountain area of Bratan-Kavakliika can be traced over 150 ancient ore production sites and two shafts (near the villages of Kolio Marinovo and Gorno Novo Selo), as well as many traces of washing placer gold. This evidence gives the opportunity to accept its relation to the ancient ore production and not as monument of a cult character (Nenov, 2008).

Fig. 9. The unique geoarchaeological monument "Kutela" below the Bratan Peak in Sarnena Sredna Gora Mts (granite) (Source: Nenov, 2008).

There are both autochthonous (endogenous) and placer (river, alluvial) deposits and manifestations of gold, which have been the subject of extraction of the most ancient times until the present day. The indigenous gold deposits are the gold-containing copper deposits “Assarel”, “Medet”, “Radka”, “Elshitsa”, “Tsar Assen”, “Vaykov Peak”, “Petelovo” in the Panagyurishte ore region, gold-bearing deposits and manifestations in the Ihtimanska Sredna Gora Mts (around Golyama Rakovitsa and Verinsko), in the Sarnena Sredna Gora Mts (around the villages of Svezhen, Osetenovo, Chehlare, Slavyanin, Kolyu Marinovo, Gorno Novo Selo, etc.) (Valev & Filipov 1983, Nenov 2008).

The deposits of many rivers in Sredna Gora Mts contain placer gold, ie. "native" gold released from the parent rock (Nenov 2008). The river beds and river terraces of the Stara Reka River, the river valley of the Topolnitsa River and its middle tributaries (especially the Mechenska River and Panagyurska Luda Yana River), the left tributaries of the Maritza River (Rahmanliyska River, Omurovska River, Sazliyka River), the tributaries of the Tundzha River (flowing from the massifs of Bratan, Cavakliyka and Moruley) are gold-bearing. During antiquity the gold production has been well developed by washing (panning) of placer gold from young Quaternary placers. Material traces of this activity are mounds of washed pebble materials, which are rarely found. They have been periodically destroyed by the high waters of the rivers or as a result of anthropogenic activity. Nevertheless, such mounds have been preserved along the Topolnitsa River (near the village of Chavdar), Saplama River, Turiiska River, Golyamata Reka River, and near the villages of Chehlare, Slavyanin and Medovo. Such mounds have been known also along the Sazliika River, but now they are under the waters of the Chatalka Dam. Some ancient shafts for gold production were found during recent digging for a channel near the village of Pancharevo – in Pliocene (more probably in Pleistocene) gold bearing conglomerates. In many of them, there is an amateur production and nowadays (Nenov 2008).

The uranium deposits in the adjacent parts of the Upper Thracian Lowland to the Sredna Gora Mts represent a significant resource. With proven reserves of such ores, Bulgaria occupies one of the first places in Europe, but after 1989 their production in Bulgaria is closed. The deposits of asbestos, talc and vermiculite around the town of Ihtiman, pegmatites and pegmatite fields for the production of feldspar, muscovite, kyanite were noted from the non-metallic minerals. The largest barite deposit (with gold content) in Bulgaria, now closed, is located in Sarnena Sredna Gora Mts (around the city of Stara Zagora). In Chirpan region, there are also manifestations of gypsum and various types of clay, including bentonite (Ruseva & Grozdanov 1983).

Conclusion

The tectonics of Sredna Gora Mts includes three structural complexes: the Precambrian, the Caledonian-Herzinian and the Alpine, in which several structural levels and sub-levels are distinguished. They form the main structures of the Sredna Gora Mts: Ihtimanski anticlinorium, Srednogorie horst-anticlinorium, Bailovo-Panagyuriski synclinorium (Panagyurishte Strip) and the Stara Zagora synclinorium (Stara Zagora Strip). To the west and east, these large structures are bounded respectively by the Sofia and Burgas synclinories (which in tectonic terms refer to Srednogorie zone), and to the north and south by a series of imposed depressions (grabens), on whose expand the valleys. From the north these are: Sofiyski, Saranski, Dolno Kamarski (Mirkovski), Pirdopski, Karlovski, Sheinovski, Kazanlashki, Gurkovsko-Tvardishki and Belenski grabens, and from the south - Kostenetski graben and Upper Thracian depression. Internal to the zone are the Rakitski (Gabrenski, Chukurovski) and Ihtimanski grabens.

The geological characteristics of the Sredna Gora Mts are a result of their geological development. It is connected with the development of the Srednogorie geosynclinorium which was formed at the end of the Mesozoic. Some limestones and marls have been formed

at its bottom. At the beginning of the Neozoic era (through the Paleogene), the rock layers in the region were folded. The process was accompanied by active volcanic activity, so there were formed andesite, tuffs and tuffites, which in some places were mixed with sedimentary rocks, thus forming a unified volcano-sedimentary complex. At the same time, the introduction of magma into the Earth's layers led to the formation of intrusive bodies. Older rocks - granites, gneisses, mica shales, have also been discovered in the process of surface formation. After the folding process, younger sedimentary rocks and deposits were formed.

The area of the Sredna Gora Mts is rich in minerals and ores. Significant deposits of copper ores have been discovered in Sashtinska Sredna Gora Mts, in the region of Panagyurishte Town. Polymetallic ores containing copper, lead, zinc and some other metals were found in Bakadzhitsite, while the valleys of the Topolnitsa rivers (around the town of Zlatitsa) and Luda Yana (near Strelcha and Panagyurishte) are rich in placer gold.

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Fauna of Sarnena Sredna Gora Mts, Part 1
ZooNotes, Supplement 9, 2020

Soil characteristics in the region of Sarnena Sredna Gora Mountains (Southern Bulgaria)

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Abstract. The present paper is focused on the soil characteristics of the Sarnena Sredna Gora Mts. In the lower altitude zone, with warmer and drier climate, deciduous (mostly oak) vegetation and heterogeneous rock composition, mainly Cinnamon forest soils are developed. The taller, relatively wetter and colder altitude zone, with beech forests and non-carbonate rocks, is dominated by Brown forest soils. In the highest parts of Sarnena Sredna Gora Mts, with well-developed grasslands, there are Mountain meadow soils. In the lower parts of the relief, made up of upper Cretaceous volcanics and pyroclastites, there is a localized development of Smolnitsa, and in the valleys of the rivers and depressions with low alluvial-proluvial deposits - Alluvial and Alluvial-meadow soils.

Key words: Vertisols, Umbrisols, Cambisols, Fluvisols, Rendzic Leptosols, Luvisol.

Introduction

The Sredna Gora Mts is situated in the central part of Bulgaria, bounded on the north by the Sub-Balkan Plains and on the south the Upper Thracian Lowland. The mountain is bordered by the Iskar River to the west and Tundzha River to the east. The Sredna Gora Mts is some 285 km long and about 50 km wide with highest peak Bogdan 1603 m a.s.l. Its area is approximately 6000 km^2, which is about 6% of the country's territory. Sredna Gora Mts is divided to three parts: Ihtimanska Sredna Gora (western part), Sashtinska Sredna Gora (central part) and Sarnena Sredna Gora (eastern part) (Michev *et al.* 1980, Petrova 2020).

Sarnena Sredna Gora has a distinct "chain" character, parallel to the main chain of Stara Planina Mts. It extends east from the Pesnopoy Gorge of the Stryama River, developed between the Karlovo Field and the Upper Thracian Lowland to the turn of the Tundzha River north of the town of Yambol, where is located its last hill - Zaichy Peak (Fig. 1). To the north it borders with the valleys of Kazanlak, Tvarditsa and Sliven, and to the south – with the Upper Thracian Lowland, and it wedges into this valley through the Chirpanski Vazvisheniya Hights (Fig. 1).

The length of the Sarnena Sredna Gora Mts is 135 km (half of the total length of the Sredna Gora Mts), the average width is about 20 km, at Chirpanski Vazvisheniya Heights it is just over 40 km, and to the east it is only 1-2 km. Its highest peak Bratan (1236 m a.s.l.) rises in the western part. Sarnena Sredna Gora Mts is made up of granites, gneisses, andesite, tuffs and various sedimentary rocks. In general, the relief can be defined as mountain-hilly.

The climate is mainly transcontinental, but around the region of Bratan Peak is mountainous. The middle winter temperatures rising from –4˚C to 1˚C, and the middle summer ones from 18˚C to 23˚C. The rainfalls are from 550 to 700 mm per year (Dobrev 1979, Georgiev 2005).

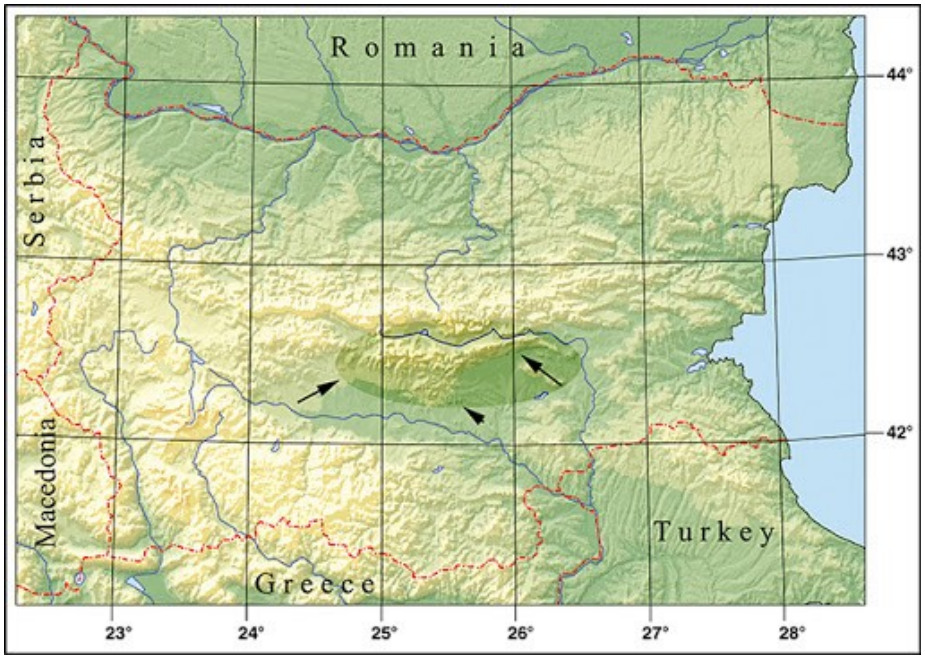

Fig. 1. Location of Sarnena Sredna Gora Mts.

Results

Soils and pedoclimatic zones of Bulgaria

Soils of Bulgaria are developed in different climatic conditions. The country lies between the strongly contrasting Temperate continental and Mediterranean climatic zones (Fig. 2). Bulgarian mountains and valleys act as barriers or channels for air masses, causing sharp contrasts in weather over relatively short distances. The climate is one of the major driving force of soil formation (Constatini *et al.* 2013). Soil climate regimes, expressed via soil moisture and soil temperature regimes, are important in a wide range of applications as soil quality, farming, and ecosystem management. Soils themselves may respond to climate change, leading to both positive and negative effects (Hristov & Filcheva 2017).

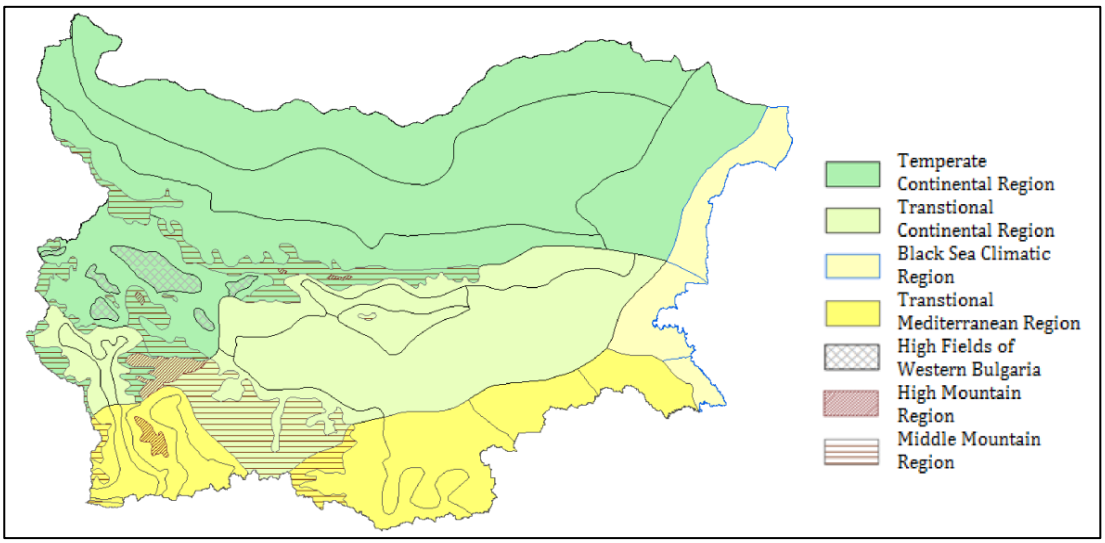

Fig. 2. Climatic map of Bulgaria (Subev *et al.* (1963) digitized by Dimitrov (2014), after Hristov & Filcheva 2017).

Five climatic regions are typical for the territory of Bulgaria (Fig. 2) – Temperate continental, Transitional continental, Transitional Mediterranean, Black Sea coast, and Mountainous (Subev *et al.* 1963, Dimitrov 2014, Hristov & Filcheva 2017). All these climatic regions have influence over soil temperature and moisture regimes as defined in Soil Taxonomy (Soil Survey Staff, 1999, 2010; FAO, 2006). Boyadjiev (1989) applied the model of Newhall (1972) and identified six different combinations of temperature and moisture regimes over the territory of Bulgaria (Fig. 3): Thermic-Xeric, Mesic-Xeric, Mesic-Ustic, Mesic-Udic, Cryic-Udic and Pergelic–Udic (after Hristov and Filcheva, 2017). The last one Pergelic - Udic is too small and it is united with Cryic - Udic zone, which is spread mainly on mountainous area of Bulgaria. The Mesic – Udic zone is cover the area of fore-mountains, high fields of central and western Bulgaria and the region of "Ludogorie" of North-East Bulgaria. Soils with Mesic – Ustic regime cover also some regions with lower hilly-mountain relief in South and West Bulgaria. Mesic - Xeric and Thermic - Xeric zones are spread over the lowest and driest places of Bulgaria, the first one covers northern parts the second one is in the south parts of Bulgaria (Hristov & Filcheva 2017).

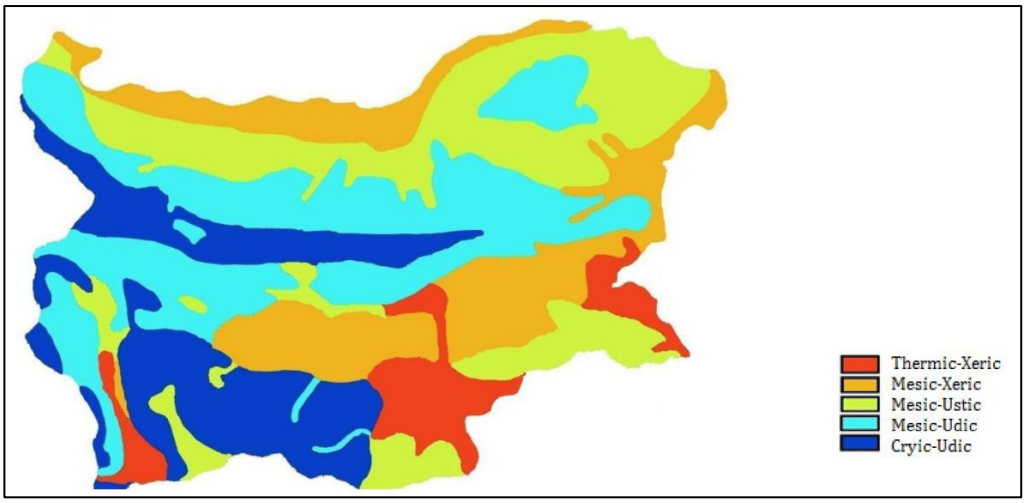

Fig. 3. Temperature and moisture regimes of Bulgarian soils (Boyadjiev 1989, after Hristov & Filcheva 2017).

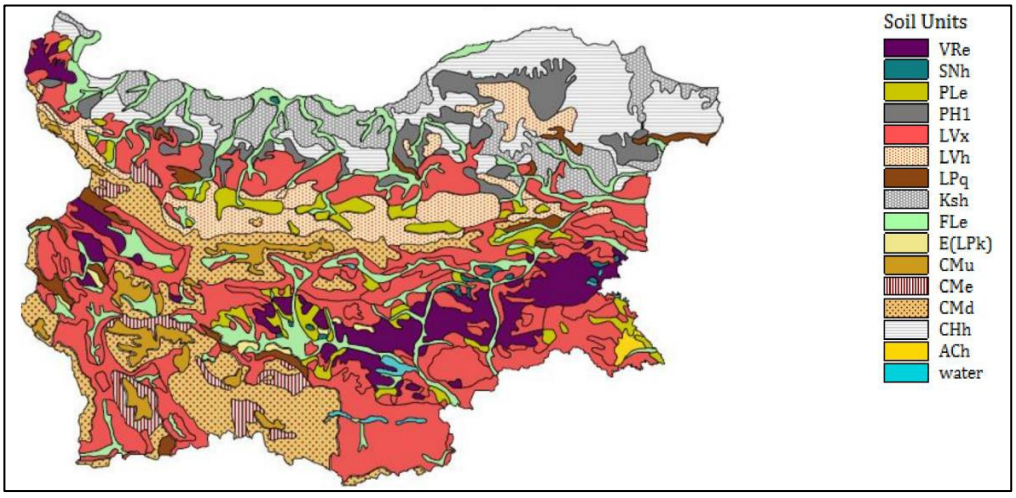

Fig. 4. Soil map of Bulgaria (Kolchakov 1994, after Hristov & Filcheva 2017).

Legend (from Fig. 4): Soil Units: VRe - Eutric Vertisols; SNh - Haplic Solonetz; PLe - Eutric Planosols; PHl - Luvic Phaeozems; LVx - Chromic Luvisols; LVh - Haplic Luvisols; LPq - Lithic Leptosols; KSh - Haplic Kastanozems; FLe - Eutric Fluvisols ; LPk - Rendzic Leptosols ; CMu - Humic Cambisols; CMe – Eutric.

The soil map of Bulgaria was made on the basis of typical soil profiles data and presented according to specific soil group of WRB (2014) (Fig. 4) (Kolchakov 1994, after Hristov & Filcheva 2017).

Soils in the region of Sarnena Sredna gora Mts

Sredna Gora Mts soil cover is closely dependent on geological structure, relief, vertical zoning of bioclimatic conditions, etc.

According to data from Hristov & Filcheva (2017) and Jordanova (2017), among the most common soils in the Sarnena Sredna Gora Mts are: Cinnamon forest soils (Luvisol), Brown forest soils (Cambisols), Smolnotsa (Vertisols), Alluvial soils (Fluvisols), Mountain meadow soils (Umbrisols), Rendzini (Rendzic Leptosols), etc.

Cinnamon forest soils (Luvisol): Both varieties are common - typical and podzolic. They occupy the low parts of hills, usually up to 800 m a.s.l., characterized by warmer and drier climate, with deciduous (mostly oak) vegetation and heterogeneous rock composition.

Brown forest soils (Cambisols): They are widespread in the mountain slopes with altitudes from 800 to 1600-1700 m a.s.l., relatively wetter and colder climate, with beech forests and non-carbonate rocks.

Smolnitsa (Vertisols): They have little distribution in the lower parts of the relief. They are mainly developed in the valley bottoms and made up of upper Cretaceous volcanic rocks and pyroclastites, tuffs and tuffites.

Mountain meadow soils (Umbrisols): They are limited only in the highest mountain parts, with well-developed grassland (around Bratan Peak).

Alluvial and alluvial-meadow soils (Fluvisols): They have limited distribution in the valleys of rivers and in the valleys and depressions, filled with young alluvial-proluvial deposits.

Rendzini (Rendzic Leptosols): These are soils distributed on calcareous (calcareous) terrains. They are characteristic of the Chirpanski Vazvisheniya Hights.

An attempt for agro-ecological zoning of soil and climate conditions in the watershed of Tundzha River with respect to the main agricultural crops is made by Pankov (2014) as presented below.

In the region of Karlovo, Kazanlak and Sliven fields, as well as part of the fence slopes of Sarnena Sredna Gora, the soil cover dominates Deluvial, Alluvial-meadow and Cinnamon forest soils. The region has a specific climate, which is due to its valley character and its protection by the north. The average annual temperature is about 10.5°C. The temperature sum for the growing season in agriculture, which starts on average around the 10th March, is about 3800°C. Rainfall is 660 mm. The balance of atmospheric humidity for the growing season is represented by a deficit of about -200 mm (Pankov 2014).

In the region around the town of Yambol the relief is relatively flat, however, affected by tectonic movements with predominant subsidence. The soil cover is composed mainly of Smolnitsa, Leached Cinnamon forest soils and Alluvial-meadow soils. In terms of climate, this region is characterized by relatively mild winters and hot summers. The average annual temperature is 12°C. The vegetation period has very good thermal insulation - a temperature sum of about 4250°C. There is too little humidity - 600 mm of rainfall here annually, with high evaporation. The deficit in

the atmospheric humidity balance for the growing season is about -380 mm (Pankov 2014).

In the northwest direction of the town of Yambol (northeast part of the Stara Zagora Field), the soil cover is made up of Leached Cinnamon forest soils, Pseudopodzolic forest soils, Smolnitsa, Rendzini, Alluvial-meadow and Deluvial-meadow soils. The territory falls in the climatic region of Eastern Central Bulgaria, which is distinguished by its transitional continental character. The average annual temperature is high - about 12°C. The heat supply of the area is very good and allows the development of many thermophilic crops. The temperature sum for the growing season is about 4200°C. Annual rainfalls here averages 600 m, of which 320 mm fall during the growing season. The balance of the atmospheric humidity is with very large deficit - about -450 mm as the area is quite arid (Pankov, 2014).

In the region of the southern foothills of Sarnena Sredna Gora Mts, the terrain is rugged, low mountainous, with extensive flattening, with thick and deeply incised hydrographic network and strongly expressed conditions for the erosion processes. The soil cover is variegated, but the Leached Cinnamon forest soils, Pseudopodzolic forest soils and undeveloped soils are more prevalent. The geographical location determines the climatic characteristics. The average annual temperature for the higher parts is about 10°C and for the lower is 12°C. Temperature amounts during the growing season reach 3500-4000°C. The amount of precipitation is about 600 mm. The deficit in the atmospheric humidity balance, depending on the orographic features, varies in wide limits from -100 mm to -480 mm.

Description of some soil profiles from the region of Sarnena Sredna Gora Mts

Description of soil profile of typical Cinnamon forest soil (Haplic Luvisol, Chromic) near the Chirpanski Vazvisheniya Hights (at 274 m a.s.l.) was made by Jordanova (2017):

Ak horizon: 0–10 cm, humic horizon, brown-red color, dense, clayey, presence of rock fragments, vegetation roots and carbonate concretions

Btk1 horizon: 10–38 cm, illuvial horizon, red-brown color, heavy clayey, dense, presence of rock fragments, vegetation roots and carbonate concretions

Btk2 horizon: 38–60 cm, illuvial horizon, light brown color, clayey, carbonate concretions and rock fragments present, transition with Btk1— sharp

BCk horizon: 60–78 cm, transitional horizon, beige color with orange and grayish-green mottles, loose texture, abundant rock fragments

Ck horizon: C horizon, light beige color, mottled, abundant rock fragments
Parent rock: marls with chert.

Description of soil profile of Brown forest soil in the central part of Sredna Gora Mts was made by Shishkov *et al.* (2016):

Ah 0-7 cm, color 10YR 4/3 (dry) and 10YR 3/3 (moist), very friable fine granular structure 1-2 mm size, weak ped development, many fine roots and residiums

A 7-27 cm, color 10YR 5/3 (dry) and 10YR 4/2 (moist), friable medium granular structure 2-5 mm size, moderate ped development, some fine roots

AB 27-60 cm, color 10YR 6/3 (dry) and 10YR 4/3 (moist), firm coarse granular structure 5-10 mm, strong ped development, few roots 1-2 mm diameter

Bw 60-120 cm, color 10YR 6/4 (dry) and 10YR 4/4 (moist)), friable fine 5-10 mm subangular blocky structure, strong ped development

BC 120-170 cm, color 10YR 6/6 (dry) and 10YR 5/8 (moist), friable single grain structure and massive.

Description of soil profile of Vertisols near the town of Chirpan (at 160 m a.s.l.) was made by Jordanova (2017):

0–6 cm: humic (A1) horizon, dark gray, sandy-clayey, no carbonates

6–40 cm: humic (A2) horizon, black-gray, heavy clayey, dense, slickensides present

40–100 cm: humic (A3) horizon, tarry black, no carbonates, heavy clayey, slickensides present

100–140 cm: transitional AB horizon, dark brown, dense, carbonate and Fe-Mn concretions

140–155 cm: illuvial (Bk) horizon, gray-brown, clayey, carbonate concretions, Fe-Mn concretions present

155–183 cm: transitional (BCk) horizon, light brown, carbonates and carbonate concretions present

183–240 cm: Ck horizon, light brown-beige, sandy
Parent rock: Pliocene clays

Conclusion

The soil cover of Sarnena Sredna Gora Mts is closely dependent on geological structure, relief, vertical zoning of bioclimatic conditions, etc. In the lower altitude zone, with warmer and drier climate, deciduous (mostly oak) vegetation and heterogeneous rock composition, mainly Cinnamon forest soils are developed. The taller, relatively wetter and colder altitude zone, with beech forests and non-carbonate rocks, is dominated by Brown forest soils. In the highest parts of Sarnena Sredna Gora Mts, with well-developed grasslands, there are Mountain meadow soils. In the lower parts of the relief, made up of upper Cretaceous volcanics and pyroclastites, there is a localized development of Smolnitsa, and in the valleys of the rivers and depressions with low alluvial-proluvial deposits - Alluvial and Alluvial-meadow soils.

Vegetation is closely dependent on physical and geographical conditions, but is also influenced by human economic activity. Alluvial soils are accompanied by hydrophilic grass and forest vegetation - alder, willow, poplar. Areas with the distribution of Cinnamon forest soils and Smolnitsa constitute arable land, and in the higher parts there are oak, hornbeam and oak-hornbeam forests. Significant areas of the forest fund have been artificially replaced by coniferous forest plantations, mainly pine.

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The habitats of Sarnena Gora Mountains: a short review

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Abstract. A short literature review on the vegetation associations and the habitats of Sarnena Gora was done.

Key words: vegetations, associations, habitats.

Introduction

This review article aims to support the analysis and other data processing according to the fauna of Sarnena Gora Mts.

Material and Methods

The literature survey includes a short list of sources (Toshev 1903, Stanev 1973, 1975, Michev *et al.* 1980, Penin 2007, Radanova, 2015, Radukova & Lacheva 2017). A small amount of information was collected and by the original observations of the author during years.

Results

Geographical features

Sredna Gora (Sarnena Gora) is a mountain massif of the easternmost part of Sredna Gora Mts. It's a hilly area between the rivers Stryama (to the west) and Tundzha (to the east). Its northern borders are Karlovska, Kazanlashka and Slivenska Valleys, and also the Mezdenishki Gorge of Tundzha River. To the south the mountain slopes gradually transform into the Upper Thracian Lowland and the Yambol Plain. There is a mountain bridge between Sredna Gora and Stara Planina Mts near Kalofer town, called Strazhata (Krastets).

The total mountain length from west to east is 153 km, and its width varies from 35 km (in the middle) to 5 km (the easternmost part). The area is situated on 2280 km^2. The mean altitude is 416 m a.s.l. with highest point Bratan Peak, 1235.8 m a.s.l. South of Bratan area there is a hilly part extending to the south and almost reaching Chirpan town called Chirpanski Heights (or "vazvishenia" = heights in Bulgarian) with highest point Kitkata Peak (651 m a.s.l.).

The climate is dry, transitional-continental with some areas of strong submediterranean influence. For example in some villages of the southern slope of the mountains some worm loving plants can survive winters without any protection (or just mulching): *Nerium oleander*, *Washingtonia* sp., *Opuntia ficus-indica*, *Agave americana*, *Arundo donax* and others. However in such places the winter temperatures can occasionally drop dramatically during some years (for examples to -12 or -15° C).

The whole area of Sarnena Gora is situated in the catchment of Maritsa River having a lot of springs of its left tributaries as: Svezhenska (tributary of Stryama), Srebra, Brezovska, Omurovska (with its tributary Novoselska Reka), Tekirska, Starata Reka,

Merichlerska, Martinka and Sazlyika (with its tributaries Azmaka, Bedechka and Kumurdzha), and the two right tributaries of Tundzha River – Turyiska and Gyurlya.

Urbanization and other human influence

Human settlements are known from the Neolith and the Bronze Ages. Now there are one city (Stara Zagora), one town (Pavel Banya) and 90 villages in the area of Sarnena Gora.

The agriculture and horticulture are mainly developed at the low areas of Sarnena Gora.

The logging and hunting pressure on the wildlife are intense. Tourism and recreation activities are poorly developed, mainly at the area of the highest peak at Kavaklyika Hut area. The pollution of waters and soils are very intense near the villages and roads.

Vegetation

Main ecosystems in the mountains. Toshev (1903) divided the whole chain of Sredna Gora Mts into 4 zones according to vegetation: 1. *Paliurus* zone; 2. *Quercus* zone; 3. *Fagus sylvatica* zone, to which the scarce zone of coniferous trees was also assigned; 4. Lower Alpine zone. The last zone is lacking in Sarnena Gora Mts. In contrast, the *Paliurus* and *Quercus* zones strongly dominated in large areas. The subdominants in these zones are mainly *Carpinus orientalis*, *C. betulus*, *Tilia* spp., *Ulmus* spp., *Fraxinus* spp. and some others. The natural *Fagus sylvatica* forests are restricted around the highest mountain parts – near Bratan Peak and Kavakliyka Hut. Kochev (1969) determined common fir, hornbeam and black pine as subdominants in common beech associations of a mixed tree forests.

The most remarkable azonal plant associations are the remnants of flood forests along the lower river parts. Areas of dense bushes dominated by *Clematis vitalba*, *Salix alba*, *S. fragilis*, *S. caprea*, *Rubus* sp., *Petasites* sp. and *Thypha* sp. can be observed along Bedechka River, north of Stara Zagora city. At some river banks gallery forest of *Salix* sp. and *Populus* sp. occur.

At the very small karst areas there are a kind of “islands” of wet and very rich on mosses and ferns among the xeric habitats dominated the mountains (Fig. 1). Such places are situated around some caves and limestone rock niches. There are around 10 caves and niches registered near Ostra Mogila, Novo Selo, Zemeevo and Dalboki villages, and Zhrebchevo Dam.

Rare species and species of conservation importance. In the published by Stanev (1973, 1975) floristic materials about Eastern Sredna Gora Mt. some new and rare plant species were mentioned for this floristic region: *Oryzopsis holciformis*, *Rumex tuberosus*, *Silene trinervia*, *Lathyrus aureus*, *Hypericum hirsutum*, *Amelanchier oveli*, *Carex depauperata*, *Ophris cortuna*, and *Iris sintenisii* (according Radukova & Lacheva 2017).

A large list of species was later published by Radanova (2015): *Cyclamen hederifolium*, *Fritilaria pontica*, *Ruscus aculeatus*, *Himanthoglossum hircinum*, *Bupleurum flavum*, *Dianthus moesiacus*, *Echinops ritro*, *Digitalis viridiflora*, *Paeonia peregrina*, *Bupleurum rotundifolium*, *Erytronium dens-canis*, *Asparagus officinalis*, *Lilium mortagon*, *Anacamptis pyramidalis* and others.

Invasive or introduced plant species. Possibly *Amorpha fruticosa* is one of the most notable invader species at the low wetland areas of Sarnena Gora. Most of the introduced and/or invasive grass species occur at and around the human settlements or in degraded natural habitats.

There are a lot of *Pinus nigra* and *Robinia pseudoacacia* plantations at the lower mountain parts, and such of *P. sylvestris* mainly at the areas above 400-800 m a.s.l. There are also some small patches of planted *Cedrus* species (e.g. south of Shanovo vill. and Ayazmoto Park, north of Stara Zagora city) and *Picea abies* (mostly at the higher areas).

Fig. 1. A small, newly found karstic niche near a stream south of Shanovo village (15.5.2018).

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Records of limno-terrestrial tardigrades (Tardigrada) from Sarnena Gora

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Abstract. There is no previously published data on tardigrades found in Sarnena Gora region. During the study period a total of 13 samples were collected. Specimens from genera *Echiniscus* C.A.S. Schultze, 1840, *Milnesium* Doyère, 1840, *Isohypsibius* Thulin, 1928, *Ramazzottius* Binda & Pilato, 1986, *Adropion* Pilato, 1987 and family Macrobiotidae Thulin, 1928 were discovered.

Key words: Sarnena Gora, tardigrades, distribution.

Introduction

Tardigrades, also known as water bears, are micrometazoans (500 – 1200 μm) that occupy a diversity of niches in freshwater, marine, and terrestrial habitats. As a phylum, tardigrades have a worldwide distribution. Some species with broad ecological requirements are still considered to be cosmopolitan, whereas others with more narrow tolerances are rare or endemic (Nelson *et al.* 2015).

Data on Bulgarian tardigrades is limited and for now it is not an object of international research interest. Recent studies have been conducted by Kaczmarek *et al.* (2011), Georgiev (2016), Geogiev & Kenderov (2017) and Morek *et al.* (2019) with the latter describing new species for science. Older records reported by Iharos (1961, 1973, 1982) should be confirmed by modern methods of tardigrade research.

There is no previously published data on tardigrades found in Sarnena Gora region. During the study period a total of 13 samples were collected. Specimens from the genera *Echiniscus* C.A.S. Schultze, 1840, *Milnesium* Doyère, 1840, *Isohypsibius* Thulin, 1928, *Ramazzottius* Binda & Pilato, 1986, *Adropion* Pilato, 1987 and family Macrobiotidae Thulin, 1928 were discovered.

The presented data in the paper is a starting point for further research of the diversity of Bulgarian tardigrades, including Sarnena Gora region. Long term research and more samples are needed for better quantitative and ecological data on water bears in the country.

Material and Methods

Samples from ground, tree and rock substrate were collected and later soaked in water for 12 to 24 hours. After that period, the water containing tardigrades was examined under stereomicroscope and light microscope. Species were identified to genus level using published description and modern keys. The taxonomy follows Degma *et al.* (2019).

Results and Discussion

Tardigrades were established in 61.5% of the samples. A total of 165 tardigrades were extracted with *Milnesium* species found in 47% of all samples. It's worth to be noted that from a single sample of algae in a spring *Milnesium* specimen with claw configuration [2-3][2-2] was extracted and *Adropion* sp. exuvia was found.

Class Heterotardigrada Marcus, 1927

Family Echiniscidae Thulin, 1928
Genus *Echiniscus* C.A.S. Schultze, 1840
***Echiniscus merokensis* Richters, 1904**

Material collected on 16.05.2015, North of Stara Zagora City, near Tabashka River; Habitat: bush and grass vegetation; Sample: moss *Grimmia* sp. on limestone rocks; GPS: N42 27 20.5 E25 37 58.4, 287 m a.s.l.; Number of specimens discovered: 3 (without B and D appendages); Material collected on 30.05.2015, Northwest of Zmeevo vill.; Habitat: bush and grass vegetation; Sample: moss *Grimmia* sp. on limestone rocks; GPS: N42 30 34.8 E25 35 46.8, 472 m a.s.l; Number of specimens discovered: 2.

***Echiniscus testudo* (Doyère, 1840)**

Material collected on 16.05.2015, North of Stara Zagora City, near Tabashka River; Habitat: bush and grass vegetation; Sample: moss *Grimmia* sp. on limestone rocks; GPS: N42 27 20.5 E25 37 58.4, 287 m a.s.l.; Number of specimens discovered: 8; Material collected on 30.05.2015, Northwest of Zmeevo vill.; Habitat: bush and grass vegetation; Sample: moss *Grimmia* sp. on limestone rocks; GPS: N42 30 34.8 E25 35 46.8, 472 m a.s.l; Number of specimens discovered: 11.

Remark: Ten unidentified specimens from genus *Echiniscus* were also found from the mentioned localities.

Class Apotardigrada Guil, Jørgensen & Kristensen, 2019

Family Milnesiidae Ramazzotti, 1962
Genus *Milnesium* Doyère, 1840
***Milnesium* sp.**

Material collected on 27.02.2015, Samarsko Zname National Monument, Stara Zagora; Habitat: Park; Sample: moss from alley; GPS: 42 433 922N 25 653 094E, 226 m a.s.l; Number of specimens discovered: 6 (Sex: ♀; Claws configuration: [2-3]-[3-2] and [2-3]-[3-3]). Material collected on 16.05.2015, North of Stara Zagora City, near Tabashka River; Habitat: bush and grass vegetation; Sample: moss *Grimmia* sp. on limestone rocks; GPS: N42 27 20.5 E25 37 58.4, 287 m a.s.l.; Number of specimens discovered: 6 (Sex: ♀; Claws configuration: [2-3]-[3-2]). Material collected on 30.05.2015, Northwest of Zmeevo vill.; Habitat: bush and grass vegetation; Sample: moss *Grimmia* sp. on limestone rocks; GPS: N42 30 34.8 E25 35 46.8, 472 m a.s.l; Number of specimens discovered: 16 (Sex: ♀; Claws configuration: [2-3]-[3-2], [2-3]-[3-3] and [3-3]-[3-3]). Material collected on 28.03.2018, Ostra Mogila; Habitat: Spring; Sample: algae; GPS: 42 27 10.8N 25 28 27.5E, 368 m a.s.l.; Number of specimens discovered: 2 (Sex: ♀; Claws configuration: [2-3]-[2-2]).

***Milnesium* cf. *berladnicorum* Ciobanu, Zawierucha, Moglan & Kaczmarek, 2014**

Material collected on 01.03.2015, Krairechen park, Stara Zagora; Habitat: Park; Sample: *Bierkandera* sp. from *Populus* sp.; GPS: N42 26 31.5 E25 38 19.5, 228 m a.s.l.; Number of specimens discovered: 1 (Sex: ♀; Claws configuration: [2-3]-[2-2]).

***Milnesium inceptum* Morek, Suzuki, Schill, Georgiev, Yankova, Marley & Michalczyk, 2019**

Published by Morek *et al.* (2019): Material collected on 25.08.2015, Shanovo vill., Kazanlak Valley, North Slope of Sarnena gora; Habitat: Village; Sample: *Grimmia* sp. moss from brick wall; GPS: 42 33 27N 25 37 51E, 300 m a.s.l.; Number of specimens discovered: 1 (Sex: ♀; Claws configuration: [3-3]-[3-3]).

Class Eutardigrada Richters, 1926

Family Isohypsibiidae Sands, McInnes, Marley, Goodall-Copestake, Convey & Linse, 2018

Genus *Isohypsibius* Thulin, 1928

***Isohypsibius* cf. *prosostomus* Thulin, 1928**

Material collected on 30.05.2015, Zmeevo Quarry; Habitat: Oak forest; Sample: moss from *Quercus* sp.; GPS: N42 30 09.2 E25 36 33.8, 427 m a.s.l.; Number of specimens discovered: 3.

Family Macrobiotidae Thulin, 1928

Genus *Macrobiotus* C.A.S. Schultze, 1834

***Macrobiotus* sp.**

Material collected on 27.02.2015, Samarsko Zname National Monument, Stara Zagora; Habitat: Park; Sample: moss from alley; GPS: 42 433 922N 25 653 094E, 226 m a.s.l; Number of specimens discovered: 2. Material collected on 16.05.2015, North of Stara Zagora City, near Tabashka River; Habitat: bush and grass vegetation; Sample: moss *Grimmia* sp. on limestone rocks; GPS: N42 27 20.5 E25 37 58.4, 287 m a.s.l.; Number of specimens discovered: 3.

Genus *Mesobiotus* Vecchi, Cesari, Bertolani, Jönsson, Rebecchi & Guidetti, 2016

Material collected on 16.05.2015, North of Stara Zagora City, near Tabashka River; Habitat: bush and grass vegetation; Sample: moss *Grimmia* sp. on limestone rocks; GPS: N42 27 20.5 E25 37 58.4, 287 m a.s.l.; Number of specimens discovered: 1.

Remark: Eggs are required for detailed taxonomic identification of specimens from genus *Macrobiotus* and *Mesobiotus*, which were not found in the collected samples.

Family Hypsibiidae Pilato, 1969

Genus Adropion Pilato, 1987

***Adropion scoticum* (Murray, 1905) species complex**

Material collected on 28.03.2018, Ostra Mogila; Habitat: Spring; Sample: algae; GPS: 42 27 10.8N 25 28 27.5E, 368 m a.s.l.; Number of specimens discovered: 2 (Sex: ♀; Claws configuration: [2-3]-[2-2]).

Genus *Ramazzottius* Binda & Pilato, 1986
***Ramazzottius* cf. *oberhaeuseri* (Doyère, 1840)**

Material collected on 16.05.2015, North of Stara Zagora City, near Tabashka River; Habitat: bush and grass vegetation; Sample: moss *Grimmia* sp. on limestone rocks; GPS: N42 27 20.5 E25 37 58.4, 287 m a.s.l.; Number of specimens discovered: 1; Material collected on 30.05.2015, Northwest of Zmeevo vill.; Habitat: bush and grass vegetation; Sample: moss *Grimmia* sp. on limestone rocks; GPS: N42 30 34.8 E25 35 46.8, 472 m a.s.l. Number of specimens discovered: 16.

Sarnena Gora is one of the many regions in Bulgaria that lack records of tardigrade fauna. The present paper would like to put stress on the new localities for the country, including Sarnena Gora, for future tardigrade research.

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The malacofauna (Mollusca: Gastropoda and Bivalvia) of Sarnena Gora Mts – published data and new records

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Abstract. All literature data was surveyed and critically reviewed. The new materials were collected as sieved soil and detritus samples, or by hand. A total of 109 mollusc species are known to occur in Sarnena Gora Mts. Eight were new records to the area.

Key words: gastropods, mussels, distribution.

Introduction

The malacofauna of Sarnena Sredna Gora Mts was studied for a long period of time.

First data was reported by Damjanov & Liharev (1975). Only tree species were known: *Tandonia kusceri* (Wagner 1931), *Limax macedonicus* Hesse 1928 (= *graecus* species complex) and *Helix figulina* Rossmassler 1839.

In 2002 our colleague Dian Georgiev from the Trakia University published some terrestrial snails as intermediate hosts of protostrongylid nematodes (Georgiev & Georgiev, 2002).

From 2002 to 2017 intense studies on the mollusc species divesity were carried out mainly by the first author (Georgiev 2005, 2006, 2014, 2015, 2016, 2017; Georgiev & Stoycheva 2009, Georgiev *et al.* 2015, Glöer & Georgiev 2009, Irikov & Georgiev 2002, 2008, Irikov *et al.*, 2004).

Four species were found in the region of Stara Zagora during the work on the MSc thesis of Dilian Georgiev but were not published in future papers (Georgiev 2003): *Aegopinella pura* (Alder, 1830), *Bulgarica denticulata* (Olivier, 1801), *Limax conemenosi* Boettger, 1882 and *Pupilla muscorum* (Linnaeus, 1758).

Material and Methods

All literature data was surveyed and critically reviewed. The new materials were collected as sieved soil and detritus samples, or by hand.

Results

A total of 109 mollusc species are known to occur in Sarnena Gora Mts (Tab. 1). Eight were new records to the area:

***Arion subfuscus* (Draparnaud, 1805)**

Material examined: 26.5.2018, S of Shanovo village, broad leaf forest near stream, N42 31 47.7 E25 38 39.8; 450 m a.s.l., 1 live specimen below dead tree trunk, D. Georgiev, leg.

***Boettgerilla pallens* Simroth, 1912**

Material examined: 19.10.2018, Starozagorski Bani Resort, near Birenata Kashta restaurant, N42.453418, E25.497744, 407 m a.s.l., 3 live specimens (Fig. 1), U. Schneppat, R. Cornu, I. Dedov, leg. Second known locality of this species in Bulgaria (Dedov *et al.*, 2015).

***Bulgarica denticulata* (Olivier, 1801)**

Material examined: 2.5.2016, Chirpanski Heights, Partizanin vill., yard og a house, N42 14 56.02 E25 15 2.92, 183 m a.s.l., empty shells, D. Georgiev, leg.

***Truncatellina claustralis* (Gredler, 1856)**

Material examined: 14.2.2018, S of Lyulyak vill., limestone rocks, N42 29 23.3 E25 41 16.3; 331 m a.s.l., empty shells, D. Georgiev, leg.

***Vitrea transsylvanica* (Clessin, 1877)**

Material examined: 14.2.2018, S of Lyulyak vill., limestone rocks, N42 29 23.3 E25 41 16.3; 331 m, empty shells, D. Georgiev, leg.

***Dreissena polymorpha* (Pallas, 1771)**

Material examined: 2018, Kolena Dam, W of Kolena vill., N42 28 46.31 E25 42 10.84, 288 m a.s.l., empty shells, D. Georgiev, leg.

***Pisidium moitessierianum* (Paladilhe, 1866)**

Material examined: 27.12.2003, Stara Zagora city, deposits of Bedechka River, N42 26 12.66 E25 38 28.27, 212 m a.s.l., 1 shell, D. Georgiev, leg.

***Stagnicola montenegrinus* Glöer & Pešić, 2009**

Material examined: 2019, Hrishteni vill., frog pond in yard, accidently introduced with water vegetation from the nearby Tundzha River at Shanovo vill., N42 27 13.41 E25 42 19.06, 232 m a.s.l., many live specimens, D. Georgiev leg.

Fig. 1. *Boettgerilla pallens* Simroth, 1912 from Starozagorski Bani Resort, Sarnena Gora Mts. Photo: Ivailo Dedov.

Table 1. All published and newly recorded mollusc species known to occur in Sarnena Gora Mts in alphabetical order. New records are in gray color. The authors which reported the species firstly are arranged in the second column.

№	Species	Author
	Terrestrial species	
1	*Acanthinula aculeata* (O. F. Müller, 1774)	Irikov & Georgiev (2002)
2	*Aegopinella minor* (Stabile, 1864)	Irikov & Georgiev (2002)
3	*Aegopinella pura* (Alder, 1830)	Georgiev (2003)
4	*Agardhiella parreyssii* (L. Pfeiffer, 1848)	Irikov & Georgiev (2002)
5	*Agardhiella rumelica* (Hesse, 1916)	Irikov & Georgiev (2002)
6	*Alinda* (*Alinda*) *biplicata* (Montagu, 1803)	Irikov & Georgiev (2002)
7	*Arion silvaticus* Lohmander, 1937	Irikov & Georgiev (2002)
8	*Arion subfuscus* (Draparnaud, 1805)	new record
9	*Balea perversa* (Linnaeus, 1758)	Irikov & Georgiev (2002)
10	*Boettgerilla pallens* Simroth, 1912	new record
11	*Bulgarica denticulata* (Olivier, 1801)	new record
12	*Bulgarica fritillaria* (Frivaldsky, 1835)	Georgiev & Georgiev (2002)
13	*Bulgarica* (*Bulgarica*) *varnensis* (L. Pfeiffer, 1848)	Irikov & Georgiev (2002)
14	*Carychium minimum* O. F. Müller, 1774	Irikov & Georgiev (2002)
15	*Caucasotachea vindobonensis* (Férussac, 1821)	Irikov & Georgiev (2002)
16	*Cecilioides acicula* (O. F. Müller, 1774)	Irikov & Georgiev (2002)
17	*Cecilioides spelaeus* (A. J. Wagner, 1914)	Irikov & Georgiev (2002)
18	*Cernuella virgata* (Mendes da Costa, 1778)	Irikov & Georgiev (2002)
19	*Chondrina avenacea* (Bruguière, 1792)	Georgiev & Stoycheva (2009)
20	*Chondrula* (*Chondrula*) *microtragus* (Rossmässler, 1839)	Irikov & Georgiev (2002)
21	*Chondrula* (*Chondrula*) *tridens* (O. F. Müller, 1774)	Irikov & Georgiev (2002)
22	*Cochlicopa lubrica* (O. F. Müller, 1774)	Irikov & Georgiev (2002)
23	*Cochlicopa lubricella* (Porro, 1838)	Irikov & Georgiev (2002)
24	*Cochlodina laminata* (Montagu, 1803)	Irikov & Georgiev (2002)
25	*Daudebardia* (*Daudebardia*) *brevipes* (Draparnaud, 1805)	Irikov & Georgiev (2002)
26	*Daudebardia* (*Daudebardia*) *rufa* (Draparnaud, 1805)	Irikov & Georgiev (2002)
27	*Deroceras* (*Agriolimax*) *reticulatum* (O. F. Müller, 1774)	Irikov & Georgiev (2002)
28	*Deroceras* (*Agriolimax*) *turcicum* (Simroth, 1894)	Irikov & Georgiev (2002)
29	*Deroceras* (*Deroceras*) *laeve* (O. F. Müller, 1774)	Irikov & Georgiev (2002)
30	*Deroceras* (*Deroceras*) *sturanyi* (Simroth, 1894)	Irikov & Georgiev (2002)
31	*Eubrephulus bicallosus* (L. Pfeiffer, 1847)	Irikov & Georgiev (2002)
32	*Euconulus fulvus* (O. F. Müller, 1774)	Irikov & Georgiev (2002)
33	*Euomphalia strigella* (Draparnaud, 1801)	Irikov & Georgiev (2002)
34	*Fruticicola fruticum* (O. F. Müller, 1774)	Irikov & Georgiev (2002)
35	*Helix* (*Helix*) *lucorum* Linnaeus, 1758	Irikov & Georgiev (2002)
36	*Helix* (*Helix*) *pomatia* Linnaeus, 1758	Georgiev (2005)
37	*Helix* (*Pelasga*) *figulina* Rossmässler, 1839	Damyanov & Liharev (1975)
38	*Krynickillus urbanskii* (Wiktor, 1971)	Georgiev (2005)
39	*Laciniaria plicata* (Draparnaud, 1801)	Irikov & Georgiev (2002)

40	*Limacus flavus* Linnaeus, 1758	Irikov & Georgiev (2002)
41	*Limax* (*Limax*) *conemenosi* Boettger, 1882	Georgiev (2003)
42	*Limax* (*Limax*) *graecus* (Simroth, 1889) - complex	Damyanov & Liharev (1975)
43	*Limax* (*Limax*) *maximus* Linnaeus, 1758 - complex	Georgiev (2005)
44	*Lindholmiola girva* (Frivaldsky, 1835)	Irikov & Georgiev (2002)
45	*Macedonica marginata* (Rossmässler, 1835)	Irikov & Georgiev (2002)
46	*Mastus rossmaessleri* (L. Pfeiffer, 1846)	Georgiev (2005)
47	*Merdigera obscura* (O. F. Müller, 1774)	Irikov & Georgiev (2002)
48	*Monacha* (*Monacha*) *carascaloides* (Bourguignat, 1855)	Irikov & Georgiev (2002)
49	*Monacha* (*Monacha*) *cartusiana* (O. F. Müller, 1774)	Irikov & Georgiev (2002)
50	*Monacha* (*Monacha*) *claustralis* (Menke, 1828)	Georgiev (2016)
51	*Monacha* (*Monacha*) *oshanovae* I. Pintér et L. Pintér, 1970	Georgiev (2016)
52	*Monachoides incarnatus* (O. F. Müller, 1774)	Irikov & Georgiev (2002)
53	*Oxychilus camelinus tracicus* (Hesse, 1913)	Georgiev (2014)
54	*Oxychilus* (*Mediterranea*) *hydatinus* (Rossmässler, 1838)	Irikov & Georgiev (2002)
55	*Oxychilus* (*Morlina*) *glaber striarius* (Westerlund, 1881)	Irikov & Georgiev (2002)
56	*Oxychilus* (*Riedelius*) *inopinatus* (Ulièny, 1887)	Irikov & Georgiev (2002)
57	*Oxychilus translucidus* (Mortillet, 1853)	Irikov & Georgiev (2002)
58	*Oxyloma elegans* (Risso, 1826)	Irikov & Georgiev (2002)
59	*Pomatias elegans* (O. F. Müller, 1774)	Irikov & Georgiev (2002)
60	*Pseudochondrula seductilis* (Rossmässler, 1846)	Irikov & Georgiev (2002)
61	*Pseudotrichia rubiginosa* (Schmidt, 1853)	Irikov & Georgiev (2002)
62	*Punctum pygmaeum* (Draparnaud, 1801)	Irikov & Georgiev (2002)
63	*Pupilla muscorum* (Linnaeus, 1758)	Georgiev (2003)
64	*Sphyradium doliolum* (Bruguière, 1792)	Irikov & Georgiev (2002)
65	*Succinea oblonga* Draparnaud, 1801	Irikov & Georgiev (2002)
66	*Tandonia budapestensis* (Hazay, 1881)	Irikov & Georgiev (2002)
67	*Tandonia cristata* (Kaleniczenko, 1851)	Irikov & Georgiev (2002)
68	*Tandonia kusceri* (H. Wagner, 1931)	Damyanov & Liharev (1975)
69	*Truncatellina claustralis* (Gredler, 1856)	new record
70	*Truncatellina cylindrica* (Férussac, 1807)	Irikov & Georgiev (2002)
71	*Vallonia costata* (O. F. Müller, 1774)	Irikov & Georgiev (2002)
72	*Vallonia enniensis* (Gredler, 1856)	Irikov & Georgiev (2002)
73	*Vallonia excentrica* Sterki, 1892	Irikov & Georgiev (2002)
74	*Vallonia pulchella* (O. F. Müller, 1774)	Irikov & Georgiev (2002)
75	*Vertigo* (*Vertigo*) *antivertigo* (Draparnaud, 1801)	Georgiev & Stoycheva (2009)
76	*Vitrea contracta* (Westerlund, 1871)	Irikov & Georgiev (2002)
77	*Vitrea neglecta* Damjanov & Pinter 1969	Georgiev (2005)
78	*Vitrea pygmaea* (Boettger, 1880)	Georgiev (2005)
79	*Vitrea transsylvanica* (Clessin, 1877)	new record
80	*Vitrea vereae* Irikov, Georgiev et Riedel, 2004	Irikov *et al.* (2004)
81	*Vitrina pellucida* (O. F. Müller, 1774)	Irikov & Georgiev (2002)
82	*Xerolenta obvia* (Menke, 1828)	Irikov & Georgiev (2002)
83	*Zebrina detrita* (O. F. Müller, 1774)	Irikov & Georgiev (2002)
84	*Zonitoides nitidus* (O. F. Müller, 1774)	Irikov & Georgiev (2002)

	Freshwater species	
	Gastropoda & Bivalvia	
1	*Acroloxus lacustris* (Linnaeus, 1758)	Georgiev (2005)
2	*Ancylus fluviatilis* O. F. Müller, 1774	Georgiev (2005)
3	*Anodonta anatina* (Linnaeus, 1758)	Georgiev & Stoycheva (2009)
4	*Anodonta cygnea* (Linnaeus, 1758)	Georgiev (2005)
5	*Dreissena polymorpha* (Pallas, 1771)	new record
6	*Galba truncatula* (O. F. Müller, 1774)	Georgiev (2005)
7	*Grossuana falniowskii* Georgiev & Glöer, 2015	Georgiev *et al.*(2015)
8	*Gyraulus albus* (O. F. Müller, 1774)	Georgiev (2005)
9	*Gyraulus crista* (Linnaeus, 1758)	Georgiev (2012)
10	*Musculium lacustre* (O. F. Müller, 1774)	Georgiev (2005)
11	*Physella acuta* (Draparnaud, 1805)	Georgiev (2005)
12	*Pisidium casertanum* (Poli, 1791)	Georgiev (2005)
13	*Pisidium moitessierianum* (Paladilhe, 1866)	new record
14	*Pisidium nitidum* Jenyns, 1832	Georgiev (2017)
15	*Pisidium personatum* Malm, 1855	Georgiev (2012)
16	*Pisidium pseudosphaerium* Schlesch, 1947	Georgiev (2017)
17	*Pisidium tenuilineatum* Stelfox, 1918	Georgiev (2015)
18	*Planorbarius corneus* (Linnaeus, 1758)	Georgiev (2005)
19	*Planorbis planorbis* (Linnaeus, 1758)	Georgiev (2012)
20	*Pontobelgrandiella zagoraensis* (Glöer & Georgiev, 2009)	Glöer & Georgiev (2009)
21	*Radix auricularia* (Linnaeus, 1758)	Georgiev (2005)
22	*Radomaniola bulgarica* Glöer & Georgiev, 2009	Glöer & Georgiev (2009)
23	*Stagnicola montenegrinus* Glöer & Pešić, 2009	new record
24	*Unio pictorum* (Linnaeus, 1758)	Georgiev (2005)
25	*Valvata piscinalis* (O. F. Müller, 1774)	Georgiev (2005)

Species which could be expected to occur in the mountains.

Zebrina kindermanni (L. Pfeiffer, 1853), *Multidentula ovularis* (Olivier, 1801), *Monacha ovularis* (Bourguignat, 1855), Monacha solidior (Mousson, 1863), *Radix labiata* (Rossmässler, 1835) and *Segmentina nitida* (O. F.Müller, 1774) were reported for the very closely situated Svetiiliiski Heights (Georgiev, 2006), and can be expected at the low, eastern parts of Sarnena Gora. In the same paper the species *Xeropicta krynickii* (Krynickii, 1833) was reported for Nova Zagora town, which is even closer to these mountains.

During 2018 *Eobania vermiculata* (Müller, 1774) was found by Dilian Georgiev as newly introduced in the lowland areas of Stara Zagora city (south part in the industrial zone at one big market). This species is invasive and could easily spread in the other city parts at the foothills of Sarnena Gora.

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Fauna of Sarnena Sredna Gora Mts, Part 1
ZooNotes, Supplement 9, 2020

Freshwater Decapoda (Crustacea: Malacostraca) in Sarnena Sredna Gora Mountains (Bulgaria)

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Abstract. Literature data for the presence of *Astacus astacus*, *Astacus leptodactylus* and *Austropotamobius torrentium* in Sarnena Sredna Gora are summarized.

Key words: Decapoda, Astacidae, Sarnena Sredna Gora.

Introduction

There are three native species of crayfish, *Astacus astacus* (Linnaeus,1758), *Astacus leptodactylus* (Eschscholtz, 1823), *Austropotamobius torrentium* (Schrank, 1803) and one species of freshwater crab, *Potamon ibericum* (Bieberstein, 1809) known in Bulgaria. Also, two alien freshwater decapod species are found: *Orconectes limosus* (Rafinesque, 1817) (Decapoda: Cambaridae) and *Eriocheir sinensis* H. Milne-Edwards, 1853 (Decapoda: Varunidae). The data for the distribution of these species are summarized in Bechev & Kazndzhieva (2018).

Material and Methods

The presented data are on the base of literature sources only and cover the territory of Sarnena Sredna Gora and the Tundzha River from the north.

Results

FAUNISTIC LIST

Astacus astacus (Linnaeus,1758)

Tundzha River near the town of Pavel Banya (Janeva & Russev 1985).

Astacus leptodactylus (Eschscholtz, 1823)

Small dam, Starozagorski Bani Village (Georgiev 2004, 2006); Small dam, Kolena Village (Georgiev 2004, 2006); small dam on Tundzha River under Koprinka Dam (Trichkova *et al.* 2013); Small dam (Zagorka), Stara Zagora (Bechev & Kazndzhieva 2018); Koprinka Dam (Bechev & Kazndzhieva 2018).

***Austropotamobius torrentium* (Schrank, 1803)**

Koprinka Dam by the town of Kazanlak (Subchev & Stanimirova 1998; Trichkova *et al.* 2013); Mrachenik River (Hubenova *et al.* 2010).

***Potamon ibericum* (Bieberstein, 1809)**

Sarnena Sredna Gora Mountain - artificial lake in a park, (Starozagorski Bani Resort, UTM: LH70) (Georgiev 2006).

Note: This locality has been omitted in Bechev & Kazndzhieva (2018).

Discussion

All four native freshwater decapod species known from Bulgaria are occurring in the region of Sarnena Stedna Gora.

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Fauna of Sarnena Sredna Gora Mts, Part 1
ZooNotes, Supplement 9, 2020

Protura records in Sarnena Gora Mountains

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Abstract. Six species of Protura, *Acerentulus bulgaricus, Acerentulus exiguus, Acerentulus xerophilus, Acerella muscorum, Eosentomon longisquamum* and *Eosentomon zodion*, were collected from Sarnena Gora Mountains. The species *Acerentulus exiguus, Acerentulus xerophilus, Eosentomon longisquamum, Eosentomon zodion* and recently described *Acerentulus bulgaricus,* are new records for Bulgarian proturan fauna. The Proturan fauna of Bulgaria now includes eleven species.

Key words: Hexapoda, soil organisms, distribution.

Introduction

There are only few records of Protura from Bulgaria (Szeptycki 2007). Nosek (1961, 1973) recorded from Bulgaria *Acerentulus confinis* (Berlese, 1908), *Acerella muscorum* (Ionescu, 1930), *Acerella remyi* (Condé, 1944) and *Eosentomon transitorium* Berlese, 1908. Palissa (1964) recorded *Acerentulus gisini* Condé, 1952 and Szeptycki (2005) identified *Acerentulus traegardhi* Ionesco, 1937 from Bulgaria. From Sarnena Gora Mountains only one recently described species *Acerentulus bulgaricus* Shrubovych, 2019 is known (Shrubovych *et al.* 2019).

Material and Methods

The materials, 54 specimens of Protura, were collected during 2017-2018 years from Sarnena Gora Mountains as soil and detritus samples, and separated in Berlese traps by D. Georgiev. Specimens were mounted on glass slides in Faure's medium and identification was made by Julia Shrubovych. The materials were deposited at the Institute of Systematics and and Evolution of Animals, Polish Academy of Science.

Results

From Sarnena Gora Mountains we examined six proturan species, which belong to two orders, two families and three genera, including recently described species *Acerentulus bulgaricus*. Practically all from them, *Acerentulus exiguus* Condé, 1944, *Acerentulus*

xerophilus Szeptycki, 1979, *Eosentomon longisquamum* Szeptycki, 1986, *Eosentomon zodion* Szeptycki, 1985 and *Acerentulus bulgaricus,* are new records for Bulgarian fauna of Protura. The Proturan fauna of Bulgaria now includes eleven species.

Check-list of Protura from Sarnena Gora Mountains.

Order: **Acerentomata**
Fam.: **Acerentomidae** Silvestri, 1907

Genus ***Acerella*** Berlese, 1909

***Acerella muscorum* (Ionesco, 1930)**

Material examined: 4.06.2017, 1 female, Sarnena Gora Mountains, W of Kolena village, *Pinus nigra* plantation, detritus of *P. nigra*, 42°28'58.8'' N, 25°42'18.4'' E, 319 m elev.; 24.02.2018, 12 females and 5 males, Sarnena Gora Mountains, between villages of Lyulyak and Shanovo, *Quercus* sp. forest among rocks, 42°31'44.63'' N, 25°39'01.82'' E, 460 m elev.; 20.03.2018, 3 females, Zmeyova Dupka Cave, 42°30'30.33"N 25°38'5.26"E, 659 m elev..

Ecology. This species prefers forest ecosystems (Nosek 1973, Shrubovych 2006, 2010).

Distribution in Europe. Germany (Szeptycki 2005), Austria, Bosnia and Herzegovina, Bulgaria, Czech Republic, France, Greece, Hungary, Italy, Poland, Sardinia, Slovakia, Spain, Switzerland and Ukraine (Szeptycki 2007), Serbia (Blesić and Mitrovski-Bogdanović 2012); Romania (Shrubovych and Fiera 2016).

Distribution in Bulgaria. This species was known from Rhodope Mountains (district Plovdiv): mixed, beech-oak and hornbeam-oak forests, and from Šipka Mtountain: beech forest (Nosek 1961).

Genus ***Acerentulus*** Berlese, 1908

***Acerentulus bulgaricus* Shrubovych, 2019**

Published for the area by Shrubovych *et al.* (2019): "2 females, Bulgaria, Sarnena Gora Mountains, near Kolena village, bank of stream, soil and detritus in roots of *Alnus glutinosa* (L.) Gaerth., 42°29'62"N, 25°41'28.61"E, 300 m elev., 15.VI.2017, coll. D. Georgiev; 1 maturus junior, 1 larva II, Sarnena Gora Mountains, near Kolena village, *Pinus nigra* J. F. Arnold., soil and detritus, 42°24'03.1"N, 25°34'09.8"E, 296 m elev., 6.VI.2017, coll. D. Georgiev."

Remarks. New record for the Bulgarian fauna.

***Acerentulus exiguus* Condé, 1944**

Material examined: 6.03.2018, 1 female and 1 male, Sarnena Gora Mountains, S slope of Medven Hill, S of Kolena village, 42°27'03.4''N, 25°43'48.2''E, 221 m elev.; 24.02.2018, 2 females, 2 males, 1 maturus junior and 1 larva II, Sarnena Gora Mountains, between villages of Lyulyak and Shanovo, *Quercus* sp. forest among rocks, 42°31'44.63'' N, 25°39'01.82'' E, 460 m elev.; 20.03.2018, 1 female and 3 maturus juniors, Sarnena Gora Mountains, Zmeyova Dupka Cave, 42°30'30.33"N 25°38'5.26"E, 659 m elev.

Ecology. Eurytopic species; abundant in soil, litter, mosses, decaying wood and plant–debris of forests, meadows, xerothermic grasslands and shrubs on rocks (Szeptycki 1991, Shrubovych 2010).

Distribution in Europe. Greek mainland and Ukraine (Szeptycki 2005); Austria, Bosnia and Herzegovina, Corsica, Czech Republic, France, Germany, Poland, Sardinia,

Slovakia (Szeptycki 2007); Serbia (Blesić and Mitrovski-Bogdanović 2012); Romania (Shrubovych and Fiera 2016).

Remarks. New record for the Bulgarian fauna.

***Acerentulus xerophilus* Szeptycki, 1979**

Material examined: 20.03.2018, 3 females and 3 maturus juniors, Sarnena Gora Mountains, Zmeyova Dupka Cave, 42°30'30.33"N 25°38'5.26"E, 659 m elev.

Ecology. Xerophilous species; reported from soil and litter of forests, meadow-steppes, dry grasslands and city squares (Szeptycki 1991, Shrubovych 2010).

Distribution in Europe. Poland and Ukraine (Szeptycki 2007, Shrubovych 2010), Serbia (Blesić and Mitrovski-Bogdanović 2012); Romania (Shrubovych and Fiera 2016).

Remarks. New record for the Bulgarian fauna.

Order: **Eosentomata**

Fam.: **Eosentomidae** Berlese, 1909

Genus ***Eosentomon*** Berlese, 1908

E. longisquamum Szeptycki, 1986

Material examined: 15.06.2017, 1 female and 1 male, Sarnena Gora Mountains, near Kolena village, broad leaf forest on a bank of stream, soil and detritus in roots of *Alnus glutinosa* (L.) Gaerth., 42°29'62"N, 25°41'28.61"E, 300 m elev.

Ecology. This species prefers forest and urban park ecosystems (Szeptycki 1986, Christian and Szeptycki 2004).

Distribution in Europe. Poland and Austria (Szeptycki 2007)

Remarks. New record for the Bulgarian fauna.

***Eosentomon zodion* Szeptycki, 1985**

Material examined: 24.02.2018, 4 females, 3 males and 2 maturus juniors, Sarnena Gora Mountains, between villages of Lyulyak and Shanovo, *Quercus* sp. forest among rocks, 42°31'44.63'' N, 25°39'01.82'' E, 460 m elev.

Ecology. This species prefers meadow ecosystems (Szeptycki 1985, Shrubovych 2006).

Distribution in Europe. Poland and Ukraine (Szeptycki 2007, Shrubovych 2010).

Remarks. New record for the Bulgarian fauna.

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Mecoptera and Dermaptera from Sarnena Gora Mts

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Abstract. Four species of Mecoptera and four species of Dermaptera were collected from Sarnena Gora Mts. Second record of *Panorpa vulgaris* in Bulgaria is reported.

Key words: Insecta, Mecoptera, Dermaptera, Bulgaria.

Introduction

There are only two published records of Mecoptera from Sarnena Gora Mts (Dvořák & Georgiev 2017). Order Dermaptera was not reported so far from this mountain. Here we summarize all published data and present some new records of the species from these insect orders.

Material and Methods

The material was collected by hand, sweep netting or using beer traps by D. Georgiev. Identifications were made by L. Dvořák. Materials were deposited at private collection of L. Dvořák, Czech Republic and the the Municipal Museum Mariánské Lázně. L. Dvořák prepared the text on Mecoptera; A. Popov, the text on Dermaptera.

Results

Order Mecoptera

***Panorpa germanica germanica* Linnaeus, 1758**

Sarnena Gora Mts: 6–10.9.2016, near Kolena Dam, N42°29'10.8" E25°41'22.7", 315 m a.s.l., 1♀, beer trap on tree brunch; Sarnena Gora Mts, 6–10.9.2016, near a river above Kolena Dam, N42°29'06.0" E25°41'29.3", 301 m a.s.l., 1♂, beer trap on tree brunch; 16.5.2017, Sarnena Gora Mts, N of Stara Zagora City, along Bedechka River, flood forest, N42°27'06.9" E25°37'54.8", 227 m a.s.l., collected by sweep netting; 23.5.2017, Sarnena Gora Mts, N of Kolena Village, broadleaf forest, N42°29'11.35" E 25°43'20.18", 270 m a.s.l., 1♂, found dead on a grass and hand collected.

A common subspecies occurring in most of Europe south to Central Italy and northernmost part of Greece, also widely distributed and very common in Bulgaria.

***Panorpa communis* Linnaeus, 1758**

Sarnena Gora Mts: 23.5.2017, N of Kolena Village, broadleaf forest, N42°29'11.35" E 25°43'20.18", 270 m a.s.l., 3♀, found dead on a grass and hand collected.

This species is known from almost whole Europe, south to the northernmost part of Greece, east to Siberia, also widely distributed and very common in Bulgaria.

***Panorpa hybrida* McLachlan, 1882**

Published by Dvořák & Georgiev (2017): 16.5.2017, N of Stara Zagora City, along Bedechka River, flood forest, among *Petasites*, N42°27'06.9", E25°37'54.8", 227 m a.s.l., 1♂.

In Bulgaria, *Panorpa hybrida* is known only from Rila Mts, Rila Monastery (Zelený 1971) and Stara Zagora (Dvořák & Georgiev 2017). This species inhabits central and eastern parts of Europe, north to the southernmost parts of Scandinavia and south to Yugoslavia and Bulgaria; exact distribution is unclear due to often misidentification with untypical specimens of *P. vulgaris* and *P. germanica*.

***Panorpa vulgaris* Imhoff & Labram, 1845**

Published by Dvořák & Georgiev (2017): 16.5.2017, N of Stara Zagora City, along Bedechka River, flood forest, among *Petasites*, N42°27'06.9", E25°37'54.8", 227 m a.s.l., 1♀.

In Bulgaria, *Panorpa vulgaris* is known except from this single record from Stara Zagora also from Central Stara Planina Range Dermenka Chalet, N42°43'50.7", E24°40'54.7", grazing beech forest, 1500 m a.s.l., 1♂, M. Boukal leg.). This species occurs in Western, Central, and Northern Europe; Devetak (1988) reported *P. vulgaris* from Slovenia. As Dvořák & Georgiev (2017) wrote, the record from Stara Zagora represents the first records of *P. vulgaris* from Bulgaria and from the Balkan Peninsula except its northernmost hook in Slovenia.

Order Dermaptera

***Labia minor* (Linnaeus, 1758)**

Sarnena Gora Mts: 20.6.2018, yard in Hrishteni Village, near compost pit, N42°27'13.37" E25°42'18.66", 231 m a.s.l., 1♀; 31.8.2018, same locality, under light during night, 1♀ and 1♂.

Most likely, *Labia minor* is widely distributed and common species in Bulgaria, but its records are few because of the small size of the insect and the poor study of the order in this country. The known localities in Bulgaria are Svishtov and Sofia (Nedelkov 1908), German Monastery in Lozen Mts (Buresch 1939), Kyustendil (Nedelkov 1908), NW-Rila Mts (Hubenov *et al.* 2000) and Pazardzhik (Nedelkov 1909). This species is almost cosmopolitan in distribution. It originates from Europe and Western Asia, and as nonindigenous occurs also in all other continents.

***Forficula auricularia* Linnaeus, 1758**

Sarnena Gora Mts: 23.5.2017, yard in Hrishteni Village, on *Vicia faba*, N42°27'13.37" E25°42'18.66", 231 m a.s.l., 1♀.

A widely distributed and very common species in Bulgaria (Popov 2007). *Forficula auricularia* is a native species in the Western Palaearctic with secondary cosmopolitan distribution.

***Forficula smyrnensis* Serville, 1839**

Sarnena Gora Mts: 29.8.–5.9.2016, Hrishteni Village, yard, N42°27'12.7" E25°42'18.9", 231 m a.s.l., 1♀, beer trap on tree brunch; 6–10.9.2016, near Kolena Village, *Pinus nigra* forest, N42°28'45.6" E25°42'28.8", 292 m a.s.l., 1♂, beer trap on a pine tree brunch; 6–10.9.2016, near Kolena Dam, N42°29'10.8" E25°41'22.7", 315 m a.s.l., 1♀, beer trap on tree brunch; 23–25.5.2017, S of Kolena Village, Medven Hill, broadleaf forest (*Carpinus orientalis*, *Quercus* spp.), N42°27'23.6" E25°44'00.6", 215 m a.s.l., 1♀.

In Bulgaria, this species has been found north of Varna (Buresch 1939, Drensky 1942, Matzke 2000), in Ograzhden Mts (Harz 1985), Staro Zhelezare in Thracian Lowland

(Popov 1970), Kamchia Valley (Buresch 1939), Kosti and Gramatikovo in Strandzha Mts (Buresch 1939, Harz 1985). *Forficula smyrnensis* is distributed on the Balkan Peninsula and adjacent parts of Hungary and Romania, as well as in Crimea, Anatolia, Cyprus, Syria, Lebanon, Iraq, Transcaucasia and Iran. Information about the occurrence of the species in Corsica seems doubtful.

***Forficula aetolica* Brunner von Wattenwyl, 1882**

Sarnena Gora Mts: 22.9.2016, yard in Hrishteni Village, under dead wood, N42°27'13.37" E25°42'18.66", 231 m a.s.l., 1♂.

Distribution of *Forficula aetolica* in Bulgaria is restricted only in the southern part of the country. So far, the species is known from Svilengrad (4 km NW of the town), N41°47'35.2" E26°08'06", 57 m a.s.l., 26.10.2012, leg. G. Hristov and D. Chobanov, 1♀, (http://www.boldsystems.org/index.php/Taxbrowser_Taxonpage?taxon=Forficula%20aetolica) and from Veselie in Strandzha Mts (Murányi 2013).

The range of this species covers Greece, including Thrace, Central Greece, Peloponnesus and the islands of Rhodes, Karpathos, Crete and other Aegean islands (Reichardt 1978, Ingrisch & Pavićević 1985, Murányi 2013), Southern Bulgaria (see above), European Turkey (Ebner 1919), the whole Anatolia (Anlaş & Kočárek 2012, Özgen *et al.* 2016), Cyprus (Anlaş & Kočárek 2012), Lebanon (Steinmann 1993, according to Anlaş & Kočárek 2012), Crimea (Semenov-Tian-Shansky 1908, Stsherbakov 1913), Caucasus (Burr 1911) and Iran (Sakenin *et al.* 2010).

Because data on the ecology of *Forficula aetolica* are scarce and scattered throughout the literature, we summarize knowledge of the habitats of the species. In Bulgaria, it inhabits leaf litter of *Salix* sp. (http://www.boldsystems.org/index.php/Taxbrowser_Taxonpage?taxon=Forficula%20aetolica), and in Anatolia, *Quercus ithaburensis* and *Quercus infectoria*; meadows with shrubs of *Juniperus oxycedrus* and among the herbaceous vegetation with *Euphorbia anacampseros*; orchards of *Olea europaea*; orchards of *Malus domestica* (Anlaş *et al.* 2010); orchards of *Prunus armeniaca* (Özgen *et al.* 2016). *Forficula aetolica* is observed on folded leaves of *Prunus*, *Ficus* and *Pyrus*, and in dried fruits of *Colutea arborescens* in Crimea (Kusnezov 1903); in flower buds of *Cynara scolymus* in European Turkey (Ebner 1919); on the stems of *Euphorbia venata* in Greece (Le Restif 1987).

Fig. 1. The male of *Forficula aetolica* found in a yard in Hrishteni Village.

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Horse flies (Tabanidae, Diptera) of Sarnena Gora Mountains

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Abstract. The study on the composition of the tabanid fauna has been conducted on the territory of Sarnena Gora Mountains. The summarized references data and the results of the present study show that the Sarnena Gora Mountains tabanid fauna was represented by 53 species-group taxa (51 species and 2 subspecies). They belonged to 10 genera: *Silvius* (1 species), *Chrysops* (4 species), *Atylotus* (3 species), *Therioplectes* (2 species and 1 subspecies), *Hybomitra* (5 species), *Tabanus* (22 species and 1 subspecies), *Heptatoma* (1 species), *Haematopota* (10 species), *Dasyrhamphis* (2 species) and *Philipomyia* (1 species). Forty three tabanid localities have been registered in the study area of which 8 are new. Seven new localities of *Tabanus sudeticus* Zeller, 1842 have been reported on the territory of Sarnena Gora Mountains.

Key words: tabanids, fauna, Sarnena Gora Mountains, Bulgaria.

Introduction

Studies on the composition of the tabanid fauna in Sarnena Gora Mountains date from the beginning of the last century. At the beginning of the 20th century Nedialkov (1912) reported 5 species (*Chrysops relictus* Meigen, 1820, *Therioplectes gigas* (Herbst, 1787), *Tabanus lunatus* Fabricius, 1794, *Tabanus bromius* Linnaeus, 1758 and *Dasyrhamphis umbrinus* (Meigen, 1820) from Chirpan area. Drensky (1929) reported three species (*Silvius alpinus* (Scopoli, 1763), *Tabanus bromius* Linnaeus, 1758 and *T. glaucopis* Meigen, 1820) from the village of Turia, and two species (*Therioplectes gigas* (Herbst, 1787) and *Therioplectes tricolor* Zeller, 1842) from Chirpan. The presence of the species *Silvius alpinus*, *Tabanus bromius* and *T. glaucopis* in the fauna of Sarnena Gora Mountains was confirmed by Ganeva (1998) in a systematic study of the fauna and ecology of the tabanids in Stara Zagora region. She identified 47 species from 5 localities in the eastern part of Sarnena Gora Mountains (Ganeva, 1998). In her subsequent studies on the Tabanidae family, Ganeva (2002) reported another species, *Dasyrhamphis umbrinus* Mg., registered in the area of the village of Oryahovitsa. Studies on the diversity of the tabanid fauna of Sarnena Gora Mountains continued with field collections in the period 2002-2005. The analysis of the reference data and the collected material from 16 localities (13, of which, new ones) gives reason for Ganeva (2011) to summarize that the tabanid fauna of Sarnena Gora Mountains is represented by 48 species from 10 genera. New data on the species diversity of tabanids in the area are published by Ganeva & Kalmushka (2012) as a result of an in-depth and focused study of the fauna and phenology of tabanids in the Chirpan Eminences. They report 28 species, 13 of which are new to the area studied.

The episodic field collections, conducted in different localities on the territory of Sarnena Gora Mountains, indicate the presence of a rich, in relation to species, tabanid fauna, which has not been sufficiently studied. There is no information in the references about the composition and distribution of the tabanids in the other two parts of Sredna Gora Mountains - Sasthinska and Ihtimanska. This was the main reason for the initiation of a research project on the systematic study of the Sredna Gora Mountains tabanid fauna. The results in this paper are a part of this study concerning only Sarnena Gora Mountains and are published for the first time.

Material and Methods

The study on the species composition of the tabanids in Sarnena Gora Mountains is part of the conducted study of the group in Sredna Gora Mts. The tabanid fauna was studied on the basis of materials collected from 13 localities on the territory of Sarnena Gora Mountains. The altitude of the field collections varied from 285 m (L13) to 955m (L4). Horse flies were collected by sweep net between May and July, 2009. The processing of the insects was carried out in the laboratory. The collected specimens were identified according to the keys of Chvála *et al.* (1972) and Olsufjev (1977). A total of 319 (317♀ и 2♂) specimens were collected, processed and determined to species.

A list of the identified tabanid species and a list of the studied localities are presented. The sequence of species was done according to the Catalogue of Palaearctic Diptera (Chvála 1988). The list of the localities indicates the altitude, coordinates, collection dates and the number of collected specimens. Altitude and geographical coordinates were obtained through measurement with a Garmin GPS Navigator Etrex Vista HCx.

List of localities

Locality 1 (L1). Saedinenie village, 357 m a. s. l., 42.36N, 25.30E: 7.06.09, 7♀.

*Locality 2 (L2). Naydenovo village, 345 m a. s. l., 42.383N, 25.267E: 7.06.09, 10♀; 14.06.09, 9♀.

Locality 3 (L3). Gorno Novo selo village, 597 m a. s. l., 42.450N, 25.233E: 7.06.09, 1♀.

Locality 4 (L4). Kavakliyka chalet, 955 m a. s. l., 42.484N, 25.220E: 7.06.09, 14♀; 10.07.09, 4♀; 20.07.09, 3♀.

*Locality 5 (L5). 1 km after Kavakliyka chalet in the direction of Gorno Novo selo village, 902 m a. s. l., 14.06.09, 43♀; 10.07.09, 27♀.

*Locality 6 (L6). The fork for Kavakliyka chalet and Turia village, 14.06.09, 14♀+1♂; 10.07.09, 8♀; 20.07.09, 10♀.

Locality 7 (L7). Turia vilage, 475 m a. s. l., 42.567N, 25.183E: 10.07.09, 45♀; 20.07.09, 17♀.

*Locality 8 (L8). The fork for Bogdan peak, 10.07.09, 12♀.

*Locality 9 (L9). Babek village, 347 m a. s. l., 42.26N, 25.4E: 7.06.09, 9♀; 14.06.09, 7♀+1♂; 10.07.09, 11♀; 20.07.09, 2♀.

*Locality 10 (L10). Svezhen village, 720 m a. s. l., 42.500N, 25.017E: 7.06.09, 11♀; 10.07.09, 2♀.

*Locality 11 (L11). Mrachenik village, 596 m a. s. l., 42.500N, 24.967 E: 7.06.09, 16♀.

*Locality 12 (L12). Nauchen village, 415 m a. s. l., 42.560N, 26.083E: 22.05.09, 12 ♀; 30.06.09, 21♀.

Locality 13 (L13). Korten village, 285 m a. s. l., 22.05.09, 2 ♀;

* - new localities in Sarnena Gora Mountains.

Results and Discussion

As a result of the study up to 319 specimens (317♀ and 2♂) were collected and identified. Seventeen species of 7 genera were identified: *Silvius* (1 species), *Chrysops* (2 species), *Atylotus* (1 species), *Hybomitra* (2 species), *Tabanus* (9 species), *Haematopota* (1 species) and *Philipomyia* (1 species) (table 1). Tabanus genus stands out with the biggest species diversity - 9 species. The mass species *T. maculicornis*, *T. tergestinus* and *Tabanus quatuornotatus*, registered for the study period, are among them (table 1). The highest activity was reported for *T. maculicornis* (101 specimens, 31.66%) and *T. tergestinus* (68 specimens, 21.32%) during the study period (table 1). The peak in the *T. maculicornis* activity is in the first half of July (10.07.09 - 61 ♀ specimens) and of *T. tergestinus* - in the first half of June (14.06.09 - 27♀ + 1♂) (table 1). *Philipomyia graeca* (33 specimens, 10.34%) is also included in the dominant structure of the tabanid community in the study area (table 1). The activity peak of *Philipomyia graeca* is in the first half of June (7-14.06., table 1), which corresponds to its phenological characteristics.

Table 1. Tabanids (Tabanidae, Diptera) from Sarnena Gora Mountains, captured between May and July, 2009.

Species	22.05.09	7.06.09	14.06.09	30.06.09	10.07.09	20.07.09	N	R/A
Silvius alpinus					2♀	2♀	4♀	1.25
Chrysops caecutiens		5♀	1♀		2♀		8♀	2.51
Chrysops viduatus		1♀					1♀	0.31
Atylotus loewianus					1♀			0.31
Hybomitra ciureai		2	4		2		8♀	2.51
Hybomitra distinguenda			2				2♀	0.63
Tabanus bifarius		7	6				13♀	4.08
T. briani		1	1				2♀	0.63
T. bromius				5	8	7	20♀	6.27
T. cordiger		1	1		1		3♀	0.94
T. glaucopis						7	7♀	2.19
T. maculicornis		**11**	**15**	**2**	**61**	**12**	**101♀**	**31.66**
T. quatuornotatus	**13**	**13**	**4**				**30♀**	**9.40**
T. sudeticus			1♂		16♀		16♀+1♂	5.33
T. tergestinus	**1**	**14**	**27♀+1♂**	**14♀**	**7**	**4**	**67♀+1♂**	**21.32**
Haematopota pluvialis			1♀				1♀	0.31
Philipomyia graeca		**13**	**11**		**9♀**		**33♀**	**10.34**
Total number of species	2	10	12	3	10	5	17	
Total number of specimens	**14♀**	68♀	73♀+2♂	21♀	109♀	32♀	317♀+2♂	99.99

In terms of species diversity most species were recorded in the study localities in the area of Kavakliika chalet (L4) and in the village of Turia (L7) - with 9 species each, followed by L5 (1 km after Kavakliika chalet), L6 (fork for Kavakliyka chalet and Turia village) and L9 (Babek village) - with 8 species each (table 2). The largest is the number of tabanids caught in L5 (1 km after Kavakliika chalet) and L7 (Turia village) - 70 and 62 respectively (Table 2).

Table 2. Collected fly samples (Tabanidae, Diptera) in each locality from Sarnena Gora Mountains between May and July, 2009 (after the sign „+" the number of captured male specimens is given).

Species	L1	L2	L 3	L 4	L 5	L 6	L 7	L 8	L 9	L 10	L 11	L 12	L 13	N
S. alpinus					1♀		3♀							**4**
C. caecutiens		4♀		1♀					3♀					**8**
C. viduatus	1♀													**1**
A. loewianus							1♀							**1**
H. ciureai	1♀	1♀		1♀	3♀	1♀	1♀							**8**
H. distinguenda					1♀				1♀					**2**
T. bifarius		4♀			4♀	1♀			3♀	1♀				**13**
T. briani									1♀		1♀			**2**
T. bromius						1♀	13♀	1♀				5♀		**20**
T. cordiger	1♀				1♀		1♀							**3**
T. glaucopis				3♀		3♀	1♀							**7**
T. maculicornis				6♀	29♀	14♀	34♀	7♀	4♀	3♀	2♀	2♀		**101**
T. quatuornotatus	2♀	1♀		3♀	4♀				1♀	2♀	4♀	12♀	1♀	**30**
T. sudeticus				2♀	3♀	1♂	2♀	1♀	7♀	1♀				**16+1**
T. tergestinus	2♀	7♀		1♀	14♀	4♀	6♀	3♀	9♀+1	2♀	4♀	14♀	1♀	**67+1**
H. pluvialis		1♀												**1**
Ph. graeca		1♀	1♀	4♀	10♀	8♀				4♀	5♀			**33**
Total number of species	5	7	1	**9**	**8**	**8**	**9**	4	**8**	6	5	4	2	**17**
Total number of specimens	**7♀**	**19♀**	**1♀**	**21♀**	**70♀**	**32+1**	**62♀**	**12♀**	**29+1**	**13**	**16**	**33♀**	**2♀**	**317+2**

In the course of the study 7 new localities for *T. sudeticus* were recorded on the territory of Sarnena Gora Mountains. They are vertically located from 347 to 955 m a.s.l. So far, data on the distribution of *T. sudeticus* in the area have only been published by Ganeva & Kalmushka (2012). They report two localities of the species on the Chirpan Eminences territory. From the above it becomes clear that *T. sudeticus* has already been established in 9 localities in Sarnena Gora Mountains.

The analysis of the references data and the results of the present study give us the reason to summarize that the tabanid fauna of the Sarnena Gora Mountains is represented by 51 species and 2 subspecies from 10 genera: *Silvius* (1 species), *Chrysops* (4 species), *Atylotus* (3 species) , *Therioplectes* (2 species and 1 subspecies), *Hybomitra* (5 species), *Tabanus* (22 species and 1 subspecies), *Heptatoma* (1 species), *Haematopota* (10 species), *Dasyrhamphis* (2 species) and *Philipomyia* (1 species) (table 3). The established species diversity represents 66.25% of Bulgaria's tabanid fauna (80 species, Ganeva, 2017).

The data in Table 3 show that only the species *Chrysops relictus* and *Tabanus lunatus*, reported by Nedialkov (1912), and *Therioplectes tricolor*, reported by Drensky (1929), have not yet been confirmed in our studies. The other 50 species-group taxa were reported by us as a result of the region's collections during the1998-2012 period (table 3). Of these, *Hybomitra ciureai*, *Tabanus bifarius*, *T. bromius*, *T. glaucopis*, *T. quatuornotatus, T.tergestinus* and *Philipomyia graeca* have been recorded in all our studies and form the group of mass species in many localities. Together with 14 other species whose presence in the Sarnena Gora mountains fauna we have confirmed three or four times, they determine the type of the tabanid fauna in the area (Table 3).

Through this study we report 8 new tabanid localities in Sarnena Gora Mountains. The total number of localities in the study area where material was collected during the 1998-2012 period is 43. New localities are reported for *Silvius alpinus* (Kavakliyka chalet), *Chrysops viduatus* (Saedinenie village), *Atylotus loewianus* (Turia village) and *T. briani* (Babek village and Murchenik village).

Table 3. Horse flies (Diptera: Tabanidae) of Sarnena Gora Mountains as reported by various sources; + - species, reported by the authors as a result of the study, l. d. – by literature data.

Species 1	Nedyalkov (1912) 2	Drensky (1929) 3	Ganeva (1998) 4	Ganeva (2002) 5	Ganeva (2011) 6	Ganeva & Kalmushka (2012) 7	Present study 8
Silvius alpinus		+	+		l. d.		**4**♀
Chrysops caecutiens			+		+	+	**8**♀
Chr. ludens			+		+	+	
Chr. relictus	+					l.d.	
Chr. viduatus			+		+		**1**♀
Atylotus flavoguttatus			+		l.d.		
A. loewianus			+		+	+	**1**♀
A.rusticus			+		l.d.		
Therioplectes gigas	+	+				+	
Th. tricolor		+				l.d.	
Th. tricolor pallidicauda			+		l.d.	+	
Hybomitra caucasi			+		l.d.	+	
Hybomitra ciureai			+	+	+	+	**8**♀
H. decora			+		l.d.		
H.distinguenda			+		l.d.	+	**2**♀
H.pilosa			+		l.d.		
Tabanus autumnalis			+	+	+	+	
T. bifarius			+	+	+	+	**13**♀
T. bovinus			+		+		
T. briani			+		l.d.		**2**♀
T. bromius	+	+	+	+	+	+	**20**♀
T. cordiger			+		+		**3**♀
T. exclusus			+	+	+	+	
T. glaucopis		+	+	+	+	+	**7**♀
T. indrae			+		l.d.		
T. lunatus	+					l.d.	
T. maculicornis			+		+	+	**101**♀
T. miki			+		+		
T. prometheus			+	+	l.d.		
T. quatuornotatus			+	+	+	+	**30**
T. regularis			+		l.d.		
T. rupium			+		+		
T. shannonellus			+	+	+		
T. spectabilis			+	+	l.d.	+	
T. spodopterus ponticus			+		+	+	
T. sudeticus						+	**16**♀**+1**♂
T. tergestinus			+	+	+	+	**67**♀**+1**♂
T. tinctus			+	+	+	+	
T. unifasciatus			+	+	+	+	
Heptatoma pellucens			+		l.d.		
Haematopota bigoti			+		l.d.		
H. csikii			+		l.d.		
H.grandis			+		l.d.		
H. italica			+		+		
H. longeantennata			+		l.d.		
H. ocelligera			+		l.d.		
H. pandazisi			+		l.d.		

H. pluvialis			+		+	+	**1**♀
H. scutellata			+		l.d.		
H. subcylindrica			+		l.d.		
Dasyrhamphis ater			+		l.d.	+	
D. umbrinus	+			+	l.d.	l.d.	
Philipomyia graeca			+	+	+	+	**33**♀
Total number of specimens							**317**♀**+2**♂
Total number of species	**5**	**5**	**47**	**15**	**24+24 by l.d.**	**24+4 by l.d.**	**17**

Checklist of Tabanidae (Diptera) from
Sarnena Gora Mountains
Family Tabanidae

Subfamily Chrysopsinae

Genus *Silvius* Meigen, 1820

Silvius (Silvius) alpinus (Scopoli, 1763)

Genus *Chrysops* Meigen, 1803

Chrysops (Chrysops) caecutiens (Linnaeus, 1758)
Chrysops (Chrysops) ludens Loew, 1858
Chrysops (Chrysops) relictus Meigen, 1820
Chrysops (Chrysops) viduatus (Fabricius, 1794)

Subfamily Tabaninae

Genus *Atylotus* Osten-Sacken, 1876

Atylotus flavoguttatus (Szilady, 1915)
Atylotus loewianus (Villeneuve, 1920)
Atylotus rusticus (Linnaeus, 1767)

Genus *Therioplectes* Zeller, 1842

Therioplectes gigas (Herbst, 1787)
Therioplectes tricolor Zeller, 1842
Therioplectes tricolor pallidicauda (Olsufjev, 1937)

Genus *Hybomitra* Enderlein, 1922

Hybomitra caucasi (Szilady, 1923)
Hybomitra ciureai (Séguy, 1937)
Hybomitra decora (Loew, 1858)
Hybomitra distinguenda (Verrall, 1909)
Hybomitra pilosa (Loew, 1858)

Genus *Tabanus* Linnaeus, 1758

Tabanus autumnalis Linnaeus, 1761
Tabanus bifarius Loew, 1858
Tabanus bovinus Linnaeus, 1758
Tabanus briani Leclercq, 1962
Tabanus bromius Linnaeus, 1758
Tabanus cordiger Meigen, 1820
Tabanus exclusus Pandellé, 1883
Tabanus glaucopis Meigen, 1820
Tabanus indrae Hauser, 1939
Tabanus lunatus Fabricius, 1794

Tabanus maculicornis Zetterstedt, 1842
Tabanus miki Brauer in Br.& Bergenstamm,1880
Tabanus prometheus Szilady, 1923
Tabanus quatuornotatus Meigen, 1820
Tabanus regularis Jaennicke, 1866
Tabanus rupium (Brauer in Br.& Bergenstamm, 1880)
Tabanus shannonellus Kröber, 1936
Tabanus spectabilis Loew, 1858
Tabanus spodopterus ponticus Olsufjev, Moucha & Chvála, 1967
Tabanus sudeticus Zeller, 1842
Tabanus tergestinus Egger, 1859
Tabanus tinctus Walker, 1850
Tabanus unifasciatus Loew, 1858

Genus *Heptatoma* Meigen, 1803

Heptatoma pellucens (Fabricius, 1776)

Genus *Haematopota* Meigen, 1803

Haematopota bigoti Gobert, 1880
Haematopota csikii Szilady, 1922
Haematopota grandis Meigen, 1820
Haematopota italica Meigen, 1804
Haematopota longeantennata (Olsufjev, 1937)
Haematopota ocelligera (Kröber, 1922)
Haematopota pandazisi (Kröber, 1936)
Haematopota pluvialis (Linnaeus, 1758)
Haematopota scutellata (Olsufjev, Moucha & Chvála, 1964)
Haematopota subcylindrica Pandellé, 1883

Genus *Dasyrhamphis* Enderlein, 1922

Dasyrhamphis ater (Rossi, 1790)
Dasyrhamphis umbrinus (Meigen, 1820)

Genus *Philipomyia* Olsufjev, 1964

Philipomyia graeca (Fabricius, 1794)

Conclusions

On the basis of the references data and the results of the present study, it can be summarized that the tabanid fauna of Sarnena Gora Mountains was represented by 51 species and 2 subspecies belonging to 10 genera. Forty three tabanid localities have been found, 8 of which are new. Seven new localities have been recorded in Sarnena Gora Mountains for *T. sudeticus*. Up to now this species was currently known for the study area only from the Chirpan Eminences territory. The type of the tabanid fauna was formed by 21 species, 7 of which are the most common species in the area.

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Fauna of Sarnena Sredna Gora Mts, Part 1
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Stoneflies (Plecoptera, Insecta) from Sarnena Sredna Gora Mts

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Abstract. We recorded a total of nine species and four subspecies of stoneflies from eleven localities in the Sarnena Sredna Gora Mountains (Bulgaria). They belong to six families and eight genera of the order Plecoptera and represent 11.93% of the 109 stoneflies known up to now for Bulgaria. One of the registered species is endemic, while ten stoneflies have been found for the first time from the mountains.

Key words: Insecta, Plecoptera, new records, Bulgaria.

Introduction

There are only four published records of Plecoptera from the Sarnena Sredna Gora Mts. The first data on the stoneflies are reported by Braasch & Joost (1971). Summary data on the stonefly fauna of the Tundzha River are also reported in the studies of Russev *et al.* (1984) and Yaneva & Russev (1985). They found one species of the family Taeniopterygidae (Plecoptera) in the river. So far, only four species of stoneflies have been recorded from the study area. This scanty information is also included in the present paper.

The aim of this work is to present comprehensive data on faunistic composition of the species-group taxa of Plecoptera of the Sarnena Sredna Gora Mts and to divulge some patterns of the stonefly distribution from zoogeographical and conservation point of view.

Material and Methods

The present study summarises all information from the available literature up to now and gives new and recent unpublished faunistic data for the stoneflies from the Sarnena Sredna Gora Mts. The materials, six species and three subspecies of Plecoptera, were collected between July 2018 and May 2019. The list of stoneflies species was completed on the basis of available bibliographic data, mentioned above in the Introduction, and original data of the authors. All the material originated from 11 localities.

The collecting of the material was done using a hand-net with mesh size of 500 µm and through hand-collecting from stone, gravel and coarse sand substrata. Stoneflies larvae were separated from the other organisms, preserved in 80% ethanol and deposited in the collection of Institute of Biodiversity and Ecosystem Research (IBER), Bulgarian Academy of Sciences (BAS), Sofia, Bulgaria. The morphological examinations were carried out with a stereo-microscope. Nomenclature and systematic arrangements followed Murányi (2008) and DeWalt *et al.* (2020). The used criteria of IUCN were after Tyufekchieva *et al.* (2019).

Published records were presented according to the literature sources and UTM code numbers followed the Bulgarian UTM Directory computer programme (Michev 1999). New

data of individual records are listed in details, including the name of the water body, day, month and year, GPS coordinates, altitude and name(s) of collector(s).

Results

Check-list of stoneflies from the Sarnena Sredna Gora Mts

Order Plecoptera

Family Taeniopterygidae Klapálek, 1905
Genus *Taeniopteryx* Pictet, 1841
***Taeniopteryx schoenemundi* (Mertens, 1923)**

Literature data: Russev *et al.* (1984): 64 (MH01 - Tundzha River, above Zhrebchevo Reservoir, 28.10.1967; MH41 - Tundzha River, Slivenski Bani Resort, 13.10.1955); **Yaneva & Russev (1985)**: 20 (MH41 - Tundzha River, Slivenski Bani Resort, 15.11. 1981).

Distribution and ecology: Typical for inundated higher vegetation, stone and gravel substrata; found in colline, submontane and montane zones; inhabiting the epipotamal and hyporhitral along the Tundzha River (from 100 m to 320 m a.s.l.).

Family Leuctridae Klapalek, 1905
Genus *Leuctra* Stephens, 1835
***Leuctra fusca fusca* (Linnaeus, 1758)**

Material examined: Byala River, near Beguntsi Village, 24.08.2018, N42°32'34.9" E24°53'14.1", 317 m a.s.l., D. Gradinarov leg.; Turiyska River, 27.05.2019, N42°30'44.79" E25°12'17.71", 663 m a.s.l., Y. Vidinova, V. Evtimova leg.

Distribution and ecology: One of the most common stonefly species in Bulgaria with wide ecological spectrum. Prefers micro-, mesolithal and fine particulate organic matter. Recorded from all over Europe.

Remarks: New record for the Sarnena Sredna Gora Mts.

***Leuctra pseudosignifera* Aubert, 1954**

Material examined: Turiyska River, 27.05.2019, N42°30'44.79" E25°12'17.71", 663 m a.s.l., Y. Vidinova, V. Evtimova leg.

Distribution and ecology: The most common species of the genus in Bulgaria. Usual in lotic sections (between 50 and 2500 m a.s.l.) with gravel and stony bottoms. Larvae with preferences for moderate- to fast-flowing waters and less tolerant of lower oxygen concentrations unlike other species of the genus.

Remarks: New record for the Sarnena Sredna Gora Mts.

Family Nemouridae Newman, 1853
Genus *Protonemura* Kempny, 1898
***Protonemura auberti* Illies, 1954**

Material examined: Byala River, before Kurtovo Village, 27.05.2019, N42°35'45.74" E24°54'35.22", 415 m a.s.l., Y. Vidinova, V. Evtimova leg.

Distribution and ecology: Prefers lotic sections from 600 to 1800 m a.s.l. with psamal, stone and gravel substrata. Typical indicator of oligosaprobity inhabiting the rhitral.

Remarks: New record for the Sarnena Sredna Gora Mts.

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

Material examined: Turiyska River, 27.05.2019, N42°30'44.79" E25°12'17.71", 663 m a.s.l.; Rahmanliyska River, above Rozovets Village, 27.05.2019, N42°27'59.15" E25°07'37.08", 504 m a.s.l., Y. Vidinova, V. Evtimova leg.

Distribution and ecology: Found in crenal and rhithral, widely distributed in Bulgaria from 300 to 2500 m a.s.l. Prefers psamal, micro- and mesolithal mixed with fine organic matter and submerged plants.

Remarks: New record for the Sarnena Sredna Gora Mts.

***Protonemura meyeri* (Pictet, 1841)**

Material examined: Turiyska River, 27.05.2019, N42°30'44.79" E25°12'17.71", 663 m a.s.l., Y. Vidinova, V. Evtimova leg.

Distribution and ecology: Prefers micro-, mesolithal and submerged plants. Found in crenal and rhithral, distributed in Bulgaria from 580 to 2200 m a.s.l.

Remarks: New record for the Sarnena Sredna Gora Mts.

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

Material examined: Turiyska River, 27.05.2019, N42°30'44.79" E25°12'17.71", 663 m a.s.l., Y. Vidinova, V. Evtimova leg.

Distribution and ecology: Widespread, prefers rocky bottom (mesolithal) and fine particulate organic matter up to above 1800 m a.s.l. Common in montane rivers.

Remarks: New record for the Sarnena Sredna Gora Mts.

Genus *Nemoura* Latreille, 1796

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

Literature data: Braasch & Joost (1971): 61 (MH42 - Tundzha River, before Sliven Town, 23.4.1970).

Material examined: Brook above Edrevo Village, 28.05.2019, N42°35'01.66" E25°48'49.56", 315 m a.s.l., Y. Vidinova, V. Evtimova leg.

Distribution and ecology: Usual in lotic river sections (from 60 up to 2500 m a.s.l.) with sandy, gravel and stony bottoms, as well as littoral zones of oligotrophic lakes. Larvae inhabit streams and rivers, from hypocrenal to epipotamal, and less tolerant of organic pollution unlike other species of the genus.

Remarks: New record for the Sarnena Sredna Gora Mts.

Family Perlodidae Klapálek, 1909

Genus *Isoperla* Banks, 1906

***Isoperla belai* Illies, 1963**

Literature data: Braasch & Joost (1971): 63 (MH42 - Tundzha River, before Sliven Town, 23.4.1970).

Distribution and ecology: Prefers micro- and mesolithal and macrophytes in the premontane, montane and subalpine rivers from 340 to 1500 m a.s.l. Balkan endemic species.

***Isoperla grammatica* (Poda, 1761)**

Material examined: Byala River, before Kurtovo Village, 27.05.2019, N42°35'45.74" E24°54'35.22", 415 m a.s.l.; Turiyska River, 27.05.2019, N42°30'44.79" E25°12'17.71", 663 m a.s.l.; Rahmanliyska River, above Rozovets Village, 27.05.2019, N42°27'59.15" E25°07'37.08", 504 m a.s.l.; Hanam Dere, above Dalboki Village, 28.05.2019, N42°29'16.24" E25°46'18.10", 288 m a.s.l.; Chuchura River, before Elhovo Town, 28.05.2019,

N42°34'08.20" E25°48'49.56", 350 m a.s.l.; Osmanska River, before Kazanka Village, 28.05.2019, N42°27'30.04" E25°24'38.20", 489 m a.s.l., all Y. Vidinova, V. Evtimova leg.

Distribution and ecology: The most common species in Bulgaria. Larvae with preferences for moderate- to fast-flowing waters. Usual in lotic sections (between 50 and 2000 m a.s.l.) with gravel and stony bottoms and rivers with particulate organic matter and psamal.

Remarks: New record for the Sarnena Sredna Gora Mts.

Family Chloroperlidae Okamoto, 1912
Genus *Siphonoperla* Zwick, 1967
***Siphonoperla neglecta* (Rostock, 1881)**

Literature data: Braasch & Joost (1971): 64 (MH42 - Tundzha River, before Sliven Town, 23.4.1970).

Distribution and ecology: Larvae are typically found in rhithral and hypocrenal of brooks and rivers between 300-2189 m a.s.l.. Mostly collected from submerged riparian vegetation or from gravel and stony habitats, usually in small number. Typical indicator of oligosaprobity.

Family Perlidae Latreille, 1802
Genus *Perla* Geoffroy, 1762
***Perla marginata* (Panzer, 1799)**

Material examined: Byala River, before Kurtovo Village, 27.05.2019, N42°35'45.74" E24°54'35.22", 415 m a.s.l., Y. Vidinova, V. Evtimova leg.; Turiyska River, 27.05.2019, N42°30'44.79" E25°12'17.71", 663 m a.s.l., Y. Vidinova, V. Evtimova leg.; Sredna Reka River, 4.5 km before Turiya Village, 22.07.2018, N42°31'45.1" E25°11'47.4", 572 m a.s.l., D. Gradinarov leg.

Distribution and ecology: Widespread, prefers rocky bottom (lithal) with woody debris, roots and logs (xylal) at 60 up to 2500 m a.s.l. Common in montane rivers. Sensitive to organic pollution.

Remarks: New record for the Sarnena Sredna Gora Mts.

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

Material examined: LH51 -Tundzha River, before Pavel Banya Town, 25.5.1981 (Unpublished data).

Distribution and ecology: Found in crenal and rhithral, widely distributed in Bulgaria from 196 to 2300 m a.s.l. Prefers psamal, micro- and mesolithal. Tolerates pollution up to β-mesosaprobic.

Remarks: New record for the Sarnena Sredna Gora Mts.

Faunistic and zoogeographical notes

Presently only 11 localities of stoneflies are known from the Sarnena Sredna Gora Mts., with a total of nine stonefly species and four subspecies recorded. They represent 11.93% of the 109 stoneflies currently known from Bulgaria. Of these 13 taxa, nine are new for the fauna of the mountains. The recorded taxa belong to six families and eight genera of the order Plecoptera. The family Nemouridae was the richest in taxa with two species and three subspecies, followed by Leuctridae, Perlidae and Perlodidae (with two species and subspecies each), Taeniopterygidae and Chloroperlidae (with one each).

According to their current distribution, the established stoneflies can be assigned to six zoogeographical categories, grouped into four zoogeographical complexes (Table 1).

Table 1. Species composition and zoogeographical characteristics of Plecoptera from the Sarnena Sredna Gora Mts.

Taxa	**Zoogeographical complexes**	**Zoogeographical categories**
Taeniopteryx shoenemundi (Mertens, 1923)	European	Mid-European
Leuctra fusca fusca (Linnaeus, 1758)	Holarctic	Palearctic
Leuctra pseudosignifera Aubert, 1954	European	Mid-and South-European
Protonemura auberti Illies, 1954	European	Mid-and South-European
Protonemura intricata intricata (Ris, 1902)	European	Mid-European
Protonemura meyeri (Pictet, 1841)	European	Pan-European
Protonemura praecox praecox (Morton, 1894)	European-Mediterranean	European-Anatolian
Nemoura cinerea cinerea (Retzius, 1783)	Holarctic	Palearctic
Isoperla belai Illies, 1963	Endemic	Balkan
Isoperla grammatica (Poda, 1761)	European	Pan-European
Siphonoperla neglecta (Rostock, 1881)	European	Mid-European
Perla marginata (Panzer, 1799)	European	Mid-and South-European
Dinocras megacephala (Klapálek, 1907)	European	Mid-and South-European

The **Holarctic species complex** includes only one zoogeographical category - Palearctic species, and is represented by two subspecies.

The **European species complex** is best represented and comprises eight species and one subspecies (69.23%) from three zoogeographical categories. Mid- and South- European species are dominant (four taxa), followed by Mid-European (three taxa) and Pan-European (two taxa).

The **European-Mediterranean species complex** includes one European-Anatolian subspecies (*P. praecox praecox*).

The **Endemic species complex** includes the Balkan endemic – *I. belai.*

Four species (*T. shoenemundi*, *P. auberti*, *I. belai* and *S.neglecta*) have been classified as Vulnerable (VU) according to the Red Data Lists of Threatened Species of Plecoptera in Bulgaria (Tyufekchieva *et al.* 2019).

Our results highlight the importance of new surveys in the Sarnena Gora Mts. region and the obtained data could be useful for the selection of conservation and protection measures within the studied area.

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Review of cestodes (Platyhelminthes: Cestoda) recorded from birds and mammals in Sarnena Sredna Gora Mountains and adjacent territories

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Abstract. A review of cestodes (Platyhelminthes: Cestoda) recorded from birds and mammals in Sarnena Sredna Gora Mountains is presented. A total of 55 species were reported: 29 from birds, 26 from mammals as two of them have been identified at the generic level only. They belong to 36 genera and 9 families of the order Cyclophyllidea. As definitive hosts, 66 vertebrate species have been reported: 46 avian and 20 mammalian species. In addition, 5 of the mammalian species were recorded as intermediate hosts also. Data about synonyms used in Bulgarian helminthological literature, hosts recorded in this area, and geographical distribution are given about each species. A host-parasite list is presented. The cestode species from birds and mammals recorded in the Sarnena Sredna Gora Mts. represent respectively 12.7% from the species recorded from birds and 30.6% from the species recorded from mammals in Bulgaria.

Key words: Cestoda, birds, mammals, review, Sarnena Sredna Gora Mts., Bulgaria.

Introduction

The species composition of the helminth parasites, in particular cestodes (Platyhelminthes: Cestoda) of vertebrate animals has been a subject of extensive studies in Bulgaria during the last 60 years. An updated overview of the cestode fauna of Bulgaria summarizing the available faunistic data on cestodes in this country was presented by Nikolov *et al.* (2010). A total of 336 species were reported: 31 species from fishes, 6 species from amphibians and reptiles, 215 species from birds and 84 species from mammals (Nikolov *et al.* 2010). Subsequently, Binkienė *et al.* (2015), Marinova *et al.* (2015) and Marinova (2016), add another 14 new cestode species for the fauna of Bulgaria, respectively 1 from mammals and 13 from birds.

The review of the literature on cestodes of birds and mammals in Bulgaria indicates that till now, investigations of the cestode fauna of particular geographic regions in the country are relatively few. Such are the helminthological studies in: Stara Planina Mountains, Vrachanska Planina Mountains, Pirin Mountains, Strandja Mountains, the Rhodopes Mountains, Vitosha Mountains, the Black Sea coast, Thracian Region, Silistra Region, the regions of Petrich and Gotse Delchev, (Genov 1984; Kornyushin *et al.* 1984; Marinova 2019).

Until now, the cestodes from birds and mammals of Sarnena Sredna Gora Mts have not been in the scope of any specialized study. Scattered data about the distribution of cestode species in the study area or some adjacent territories can be found in a number of publications, such as: from birds (Vasilev 1970, 1973; Kamburov & Vasilev 1972; Petrova 1977, 1978; Georgiev & Genov 1985, 1987; Georgiev *et al.* 1995; Vasileva *et al.* 2004) and mammals (Yanchev 1963, 1965; Todorov 1963; Georgieva & Kamenov 1993; Georgieva *et al.*

1997a, b, 1999; Todorov & Boeva 1999; Chakarova 2004; Kirkova *et al.* 2011; Chakarova *et al.* 2015; Giannelli *et al.* 2017; Iliev *et al.* 2017a, b).

In addition, summarized data has been presented in review publications on the cestodes from the fauna of Bulgaria. These are: the monograph on the helminth parasites of insectivores and rodents in Bulgaria (Genov 1984), the PhD thesis of the cestodes of the family Dilepididae from passeriform birds in Bulgaria (Georgiev 1991), the checklist of cestodes of waterfowl (Marinova *et al.* 2013) and the PhD thesis of the cestodes of the family Hymenolepididae from birds of the families Anatidae and Rallidae in this country (Marinova 2016).

The aim of the present review is to summarise the information about cestode parasites of birds and mammals, which have been recorded in Sarnena Sredna Gora Mts. until 2020.

Material and Methods

The present review includes the cestode species from birds and mammals recorded from Sarnena Sredna Gora Mts until 2020. In addition, with some conditionality, the list also includes 4 species reported for the Plovdiv and Sliven Regions only, for which in the literature are not indicated specific localities and need further confirmation.

The species list is arranged according to the classification adopted by the database of Fauna Europaea (http://www.faunaeur.org). Synonyms used in the Bulgarian helminthological literature only are included. 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). The intermediate hosts in which the metacestode of the revelant species is identified are marked by asterisk (*).

Results

List of cestode species from birds and mammals in the Sarnena Sredna Gora Mountains

Phylum Platyhelminthes

Class Cestoda van Beneden, 1848

Order Cyclophyllidea van Beneden in Braun, 1900

Family Anoplocephalidae Cholodkowsky, 1902

Genus *Andrya* Railliet, 1893

(1) *Andrya rhopalocephala* (Riehm, 1881) Railliet, 1893

Report: Yanchev (1963).

Host: *Lepus europaeus* Pallas.

Locality: Dalboki, Kolena, Khrishtene (Stara Zagora Region).

General distribution: Palearctic (Spasskii 1951; Schmidt 1986).

Genus *Moniezia* Blanchard, 1891

(2) *Moniezia* sp.

Report: Halatcheva *et al.* (2001).

Host: *Capra aegagrus hircus* (L.).

Locality: Stara Zagora Region.

Genus *Mosgovoyia* Spasskii, 1951

(3) *Mosgovoyia pectinata* (Goeze, 1782) Spasskii, 1951

Report: Yanchev (1963).

Host: *Lepus europaeus*.

Locality: Dalboki, Kolena, Khrishtene (Stara Zagora Region).

General distribution: Holarctic (Spasskii 1951).

Genus *Paranoplocephala* Lühe, 1910

(4) *Paranoplocephala montana* (Kirshenblat, 1941) Tenora, Murai & Vaucher, 1984

Synonym: *Andrya montana* Kirschenblatt, 1941.

Report: Yanchev (1965).

Host: *Microtus arvalis* (Pallas).

Locality: Stara Zagora Region.

General distribution: Georgia, Armenia (Spasskii 1951).

(5) *Paranoplocephala omphalodes* (Hermann, 1783) Lühe, 1910

Report: Yanchev (1965).

Host: *Microtus arvalis.*

Locality: Starozagorski Bani (Stara Zagora Region).

General distribution: Holarctic (Spasskii 1951; Genov 1984; Schmidt 1986).

Family Catenotaeniidae Spasskii, 1950

Genus *Catenotaenia* Janicki, 1904

(6) *Catenotaenia pusilla* (Goeze, 1782) Janicki, 1904

Report: Yanchev (1965).

Host: *Mus musculus* L.

Locality: Stara Zagora Region.

General distribution: Holarctic (Genov 1984; Schmidt 1986).

Genus *Skrjabinotaenia* Akhumian, 1946

(7) *Skrjabinotaenia lobata* (Baer, 1925) Spasskii, 1951

Report: Genov (1984).

Hosts: *Apodemus agrarius* (Pallas), *Apodemus flavicollis* (Melchior), *Apodemus sylvaticus* (L.).

Locality: Sredna Gora Mts.

General distribution: Palearctic (Genov 1984; Schmidt 1986).

Family Davaineidae Fuhrmann, 1907

Genus *Raillietina* Fuhrmann, 1920

(8) *Raillietina frontina* (Dujardin, 1845) Fuhrmann, 1920

Synonym: *Raillietina* (R.) *frontina* Dujardin, 1845.

Report: Petrova (1978).

Hosts: *Sturnus vulgaris* L., *Passer hispaniolensis* (Temminck), *Picus viridis* L., *Picus canus* Gmelin, *Dendrocopos syriacus* (Hemprich & Ehrenberg) (=*Dryobates syriacus*).

Locality: Stara Zagora.

General distribution: Palearctic, Neotropical and Afrotropic Regions (Yamaguti 1959; Schmidt 1986; Kornyushin 1989; Movsesyan 2003).

(9) *Raillietina tetragona* (Molin, 1858) Fuhrmann, 1920

Report: Vasilev (1970).
Host: *Numida meleagris* L.
Locality: Stara Zagora Region.
General distribution: Cosmopolitan (Schmidt 1986; Movsesyan 2003).

Genus *Skrjabinia* Fuhrmann, 1920

(10) *Skrjabinia caucasica* Petrochenko & Kireev, 1966

Synonym: *Raillietina* (*Skrjabinia*) *caucasica* Petrochenko & Kireev, 1966
Report: Vasilev (1970).
Host: *Numida meleagris*.
Locality: Stara Zagora Region.
General distribution: Palearctic (Schmidt 1986; Movsesyan 2003).

(11) *Skrjabinia cesticillus* (Molin, 1858) Fuhrmann, 1920

Synonym: *Raillietina cesticillus* (Molin, 1858) [1].
Reports: [1] Stoimenov (1961); [2] Vasilev (1970).
Hosts: *Coturnix coturnix* L. [1]; *Numida meleagris* [2].
Locality: Sliven Region [1]; Stara Zagora Region [2].
General distribution: Cosmopolitan (Schmidt 1986; Movsesyan 2003).

(12) *Skrjabinia circumvallata* (Krabbe, 1869) Baer, 1925

Synonym: *Raillietina* (*Skrjabinia*) *circumvallata* (Krabbe, 1869) Fuhrmann, 1920.
Report: Stoimenov (1961)
Host: *Coturnix coturnix.*
Locality: Sliven Region.
General distribution: Palearctic, Indomalaya (Schmidt 1986; Movsesyan 2003).

Family Dilepididae Fuhrmann, 1907

Genus *Angularella* Strand, 1928

(13) *Angularella parachelidonariae* (Jaron, 1967) Spasskaya & Spasskii, 1971

Report: Georgiev (1991).
Host: *Emberiza hortulana* L. (?)
Locality: Starozagorski bani (Stara Zagora Region).
General distribution: Palearctic (Georgiev 1991).
Remarks: Petrova (1978) recorded the species „*Icterotaenia passerina* (Fuhrmann, 1907)“ from *Emberiza hortulana* from Starozagorski bani. These specimens have been re-examined and further recognized by Georgiev (1991) as belonging to another species, i. e. *Angularella parachelidonariae*. In addition, the author considered *A. parachelidonariae* as a specific parasite of the swallows (Hirundinidae) and regarded the finding the species in *Emberiza hortulana* as doubtful or erroneous.

Genus *Choanotaenia* Railliet, 1896

(14) *Choanotaenia infundibulum* (Bloch, 1779) Railliet, 1896.

Report: Stoimenov (1961).
Host: *Coturnix coturnix.*
Locality: Sliven Region.
General distribution: Cosmopolitan (Spasskaya & Spasskii 1977; Schmidt 1986).

Genus *Cinclotaenia* Macy, 1973

(15) *Cinclotaenia tarnogradskii* (Dinnik, 1927) Georgiev & Genov, 1985

Synonym: *Pseudanomotaenia trigonocephala* (Krabbe, 1869) of Petrova (1978) in part [1, 3].

Reports: [1] Petrova (1978); [2] Georgiev & Genov (1985); [3] Georgiev (1991).

Host: *Cinclus cinclus* (L.) [1, 2, 3].

Locality: Stara Zagora.

General distribution: Palearctic (Spasskaya & Spasskii 1977; Schmidt 1986; Georgiev 1991).

Remarks: Petrova (1978) recorded the species „*Pseudanomotaenia trigonocephala* (Krabbe, 1869)" from *Cinclus cinclus* and *Luscinia megarhynchos* from various localities in Trakia Region. These specimens have been re-examined and further Georgiev (1991) recognised the specimens from *Cinclus cinclus* from Stara Zagora as belonging to another species, i.e. *Cinclotaenia tarnogradskii*.

Genus *Dilepis* Weinland, 1858

(16) *Dilepis undula* (Schrank, 1788) Weinland, 1858

Report: Stoimenov (1963).

Host: *Corvus cornix.*

Locality: Sliven Region.

General distribution: Holarctic, Indomalaya (Spasskaya & Spasskii 1977; Schmidt 1986; Georgiev 1991).

Genus *Hirundinicola* Birova-Volosinovicova, 1969

(17) *Hirundinicola chelidonariae* (Spasskaya, 1957) Birova-Volosinovicova, 1969.

Report: Georgiev (1991).

Host: *Delichon urbica* (L.).

Locality: Starozagorski bani (Stara Zagora Region).

General distribution: Palearctic and Afrotropic (Georgiev 1991).

Genus *Monopylidium* Fuhrmann, 1899

(18) *Monopylidium cf. passerinum* Fuhrmann, 1907 (I)

Synonym: *Icterotaenia passerina* (Fuhrmann, 1907) of Petrova (1978) in part [1, 2].

Reports: [1] Petrova (1978); [2] Georgiev (1991).

Host: *Passer domesticus* (L.) [1, 2].

Locality: Stara Zagora [1, 2].

Remarks: Petrova (1978) recorded the species „*Icterotaenia passerina* (Fuhrmann, 1907)" from passeriform birds, from various localities in Bulgaria. These specimens have been re-examined and further Georgiev (1991) recognised the specimens from *Passer domesticus* from Stara Zagora as belonging to another species, i.e. *Monopylidium cf. passerinum* (I).

(19) *Monopylidium cf. passerinum* Fuhrmann, 1907 (II)

Synonym: *Icterotaenia passerina* of Petrova (1978) in part [1, 2].

Reports: [1] Petrova (1978); [2] Georgiev (1991).

Host: *Sylvia communis* Latham [1, 2].

Locality: Stara Zagora.

Remarks: Petrova (1978) recorded the species „*Icterotaenia passerina* (Fuhrmann, 1907)" from *Sylvia communis* from Stara Zagora. Subsequently, these specimens are re-examined and reidentified as *Monopylidium cf. passerinum* (II) by Georgiev (1991).

Genus *Sobolevitaenia* Spasskaya & Makarenko, 1965

(20) *Sobolevitaenia unicoronata* (Fuhrmann, 1908) Spasskaya & Spasskii, 1977

Report: Georgiev (1991).

Hosts: *Turdus merula* L., *Turdus pilaris* L., *Sturnus vulgaris*.

Locality: Stara Zagora.

General distribution: Palearctic (Spasskaya & Spasskii 1977; Schmidt 1986; Georgiev 1991).

Family Dipylidiidae Stiles, 1896

Genus *Dipylidium* Leuckart, 1863

(21) *Dipylidium caninum* (Linnaeus, 1758) Leuckart, 1863

Reports: [1] Georgieva & Kamenov (1993); [2] Georgieva *et al.* (1997a); [3] Georgieva *et al.* (1997b); [4] Georgieva, Ivanov & Prelezov (1999); [5] Kirkova *et al.* (2011); [6] Iliev *et al.* (2017b); [7] Giannelli *et al.* (2017).

Hosts: *Vulpes vulpes* (L.) [1, 2, 3, 5]; *Canis aureus* (L.) [1, 2, 5]; *Canis lupus* (L.) [2]; *Canis familiaris* (L.) [4, 6]; *Felis catus* (L.) [6, 7].

Locality: Stara Zagora Region [1, 4]; Sredna Gora Mts [2, 3]; Sredna Gora Mts (the State Forestry in Stara Zagora) [5]; Stara Zagora [6, 7].

General distribution: Cosmopolitan (Schmidt 1986).

Family Hymenolepididae Ariola, 1899

Genus *Aploparaksis* Clerc, 1903

(22) *Aploparaksis furcigera* (Rudolphi, 1819) Fuhrmann, 1926

Report: Marinova (2016).

Host: *Anas platyrhynchos* L.

Locality: Yagoda (Stara Zagora Region).

General distribution: Holarctic and Australian (New Zealand) (Spasskaya 1966; Schmidt 1986; McKenna 2010).

Genus *Diorchis* Clerc, 1903

(23) *Diorchis elisae* (Skrjabin, 1914) Spasskii & Freze, 1961

Report: Vasilev (1973).

Host: *Anas platyrhynchos* L. *f. dom.*

Locality: Stara Zagora Region.

General distribution: Palearctic (Spasskaya 1966; Schmidt 1986).

(24) *Diorchis stefanskii* Czapliński, 1956

Report: Marinova (2017).

Hosts: *Anas penelope* L.

Locality: Zagore (Stara Zagora Region).

General distribution: Holarctic (Schmidt 1986; McLaughlin 1990; Tolkacheva 1991).

Genus *Fimbriaria* Frölich, 1802

(25) *Fimbriaria fasciolaris* (Pallas, 1781) Frölich, 1802

Reports: [1] Vasilev (1970); [2] Kamburov & Vasilev (1972).

Hosts: *Numida meleagris* [1]; *Anas platyrhynchos* [2]; *Anas crecca* L. [2]; *Anas strepera* L. [2]; *Anas acuta* L. [2]; *Anas penelope* [2]; *Anas querquedula* L. [2]; *Aythya nyroca* (Güldenstädt) [2]; *Netta rufina* (Pallas) [2].

Locality: Stara Zagora Region [1]; Stara Zagora [2].

General distribution: Cosmopolitan (Spasskaya 1966; Schmidt 1986).

Genus *Hilmylepis* Skrjabin & Matevosyan, 1942

(26) *Hilmylepis prokopici* Genov, 1970

Synonym: *Hilmylepis sp.* of Yanchev (1965) [1, 2].

Reports: [1] Yanchev (1965); [2] Vasileva *et al.* (2004).

Hosts: *Crocidula leucodon* (Hermann) [1]; *Crocidura suaveolens* (Pallas) [1, 2].

Locality: Stara Zagora Region [1]; Stara Zagora [2].

General distribution: Europe: Bulgaria, Germany (Genov 1984; Schmidt 1986; Vasileva *et al.* 2004).

Remarks: *H. prokopici* was originally described from *Crocidura leucodon* and *C. suaveolens* in north-eastern Bulgaria (see Genov 1970). According to this description, specimens from *C. leucodon* and *C. suaveolens* in the Thracian Region, recorded by Yanchev (1965) as *Hilmylepis* sp., are recognized as belonging to *H. prokopici* (Genov 1970, cited after Vasileva *et al.* 2004).

Genus *Hymenolepis* Weinland, 1858

(27) *Hymenolepis diminuta* (Rudolphi, 1819) Weinland, 1858

Report: Iliev *et al.* (2017a).

Host: *Rattus rattus* (L.).

Locality: Stara Zagora.

General distribution: Cosmopolitan (Genov 1984; Schmidt 1986).

Genus *Microsomacanthus* Lopez-Neyra, 1942

(28) *Microsomacanthus abortiva* (von Linstow, 1904) Lopez-Neyra, 1942

Report: Kamburov & Vasilev (1972).

Hosts: *Anas platyrhynchos*, *Anas acuta*.

Locality: Stara Zagora Region.

General distribution: Holarctic (Spasskaya 1966; McLaughlin & Burt 1979; Schmidt 1986; Marinova *et al.* 2013) and Afrotropic (Alexander & McLaughlin 1997).

Genus *Molluscotaenia* Spasskii & Andreiko, 1971

(29) *Molluscotaenia crassiscolex* (von Linstow, 1890) Spasskii & Andreiko, 1971

Report: Genov (1984).

Hosts: *Sorex araneus* L., *Sorex minutus* L.

Locality: Thracian valley.

General distribution: Palearctic (Genov 1984).

Genus *Passerilepis* Spasskii & Spasskaya, 1954

(30) *Passerilepis crenata* (Goeze, 1782) Sultanov & Spasskaya, 1959

Synomym: *Variolepis crenata* (Goeze, 1782) [1].

Reports: [1] Stoimenov (1963); [2] Petrova (1978).

Hosts: *Corvus cornix* [1]; *Dendrocopos syriacus* (= *Dryobates syriacus*) [2]; *Turdus merula* [2]; *Sturnus vulgaris* [2]; *Pica pica* (L.) [2]; *Coturnix coturnix* [2].

Locality: Sliven Region [1]; Stara Zagora [2].

General distribution: Sub-cosmopolitan: Holarctic, Afrotropic, Indomalaya and Australian Regions (Yamaguti 1959; Spasskaya 1966; Schmidt 1986).

(31) *Passerilepis passeris* (Gmelin, 1790) Spasskii & Spasskaya, 1954

Report: Petrova (1978).

Hosts: *Coracias garrulus* L., *Hirundo rustica* L., *Lanius collurio* L., *Muscicapa striata* (Pallas), *Oenanthe hispanica* (L.), *Passer domesticus*, *Passer montanus* (L.), *Parus major* L.

Locality: Stara Zagora.

General distribution: Palearctic, Indomalaya and Afrotropic (Spasskaya 1966; Schmidt 1986; Mariaux 1994).

(32) *Passerilepis stylosa* (Rudolphi, 1809) Spasskii & Spasskaya, 1954

Report: Petrova (1978).

Hosts: *Corvus monedula* L., *Garrulus glandarius* (L.), *Pica pica.*

Locality: Stara Zagora.

General distribution: Palearctic, Nearctic and Afrotropic (Spasskaya 1966; Schmidt 1986).

Genus *Retinometra* Spasskii, 1955

(33) *Retinometra serrata* (Fuhrmann, 1906) Spasskii, 1963

Report: Petrova (1978).

Host: *Streptopelia turtur* (L.)

Locality: Stara Zagora.

General distribution: Palearctic, Indomalaya and Afrotropic (Spasskaya 1966; Schmidt 1986).

Genus *Rodentolepis* Spasskii, 1954

(34) *Rodentolepis nana* (von Siebold, 1852) Spasskii, 1954

Synonym: *Hymenolepis nana* (von Siebold, 1852) Blanchard, 1891 [1, 2].

Reports: [1] Chakarova (2004); [2] Iliev *et al.* (2017a).

Hosts: *Homo sapiens* L. [1]; *Rattus rattus* [2].

Locality: Stara Zagora Region [1]; Stara Zagora [2].

General distribution: Cosmopolitan (Schmidt 1986).

(35) *Rodentolepis straminea* (Goeze, 1782) Spasskii, 1954

Synonym: *Hymenolepis straminea* (Goeze, 1782) Spasskii, 1954

Report: Yanchev (1965).

Hosts: *Apodemus sylvaticus*, *Mus musculus.*

Locality: Chirpan Region.

General distribution: Palearctic (Genov 1984; Schmidt 1986).

Genus *Sobolevicanthus* Spasskii & Spasskaya, 1954

(36) *Sobolevicanthus gracilis* (Zeder, 1803) Spasskii & Spasskaya, 1954

Report: [1] Kamburov & Vasilev (1972).

Hosts: *Anas acuta, Anas clypeata* L., *Anas crecca, Anas platyrhynchos*, *Anas querquedula, Aythya ferina* (L.).

Locality: Stara Zagora Region.

General distribution: Holarctic, Indomalaya (Spasskaya 1966; Schmidt 1986).

Genus *Staphylocystis* Villot, 1877

(37) *Staphylocystis furcata* (Stieda, 1862) Spasskii, 1950

Report: Yanchev (1965).

Hosts: *Crocidura leucodon, Crocidura suaveolens.*

Locality: Stara Zagora Region.

General distribution: Palearctic (Schmidt 1986).

Genus *Tschertkovilepis* Spasskii & Spasskaya, 1954

(38) *Tschertkovilepis krabbei* (Kowalewski, 1895) Czaplinski & Jarecka, 1967.

Synonym: *Drepanidotaenia przewalskii* (Skrjabin, 1914) Lopez-Neyra, 1942.

Report: Kamburov & Vasilev (1972).

Hosts: *Anser anser* (L.), *Anser albifrons* (Scopoli), *Anser erythropus* (L.), *Anas platyrhynchos*, *Aythya nyroca*.

Locality: Stara Zagora Region.

General distribution: Holarctic (Czaplinski & Jarecka 1967; Schmidt 1986).

Remarks: The synonymy of *Drepanidotaenia przewalskii* and *Tschertkovilepis krabbei* has been proposed by Czapliński & Jarecka (1967).

Family Mesocestoididae Perrier, 1897

Genus *Mesocestoides* Vaillant, 1863

(39) *Mesocestoides lineatus* (Goeze, 1782) Railliet, 1893

Reports: [1] Yanchev & Genov (1978); [2] Georgieva & Kamenov (1993); [3] Georgieva *et al.* (1997a); [4] Georgieva *et al.* (1997b); [5] Georgieva *et al.* (1999).

Hosts: *Felis silvestris* Schreber [1]; *Vulpes vulpes* [2, 3, 4]; *Canis aureus* [2, 3]; *Canis lupus* [2, 3]; *Canis familiaris* [5].

Locality: Plovdiv Region [1]; Stara Zagora Region [2, 5]; Sredna Gora Mts [3, 4].

General distribution: Almost Cosmopolitan (Schmidt 1986).

(40) *Mesocestoides litteratus* (Batsch, 1786) Vaillant, 1863

Report: Yanchev (1986).

Host: *Felis silvestris*.

Locality: Stara Zagora Region.

General distribution: Europe (Schmidt 1986).

(41) *Mesocestoides* sp.

Report: Kirkova *et al.* (2011).

Hosts: *Canis aureus*, *Felis silvestris, Vulpes vulpes*,

Locality: Sredna Gora Mts (the State Forestry in Stara Zagora).

Family Paruterinidae Fuhrmann, 1907

Genus *Biuterina* Fuhrmann, 1902

(42) *Biuterina fuhrmanni* Schmelz, 1941

Report: Georgiev *et al.* (2004).

Host: *Emberiza calandra* L. (= *Miliaria calandra*).

Locality: Starozagorski Bani (Stara Zagora Region).

General distribution: Palearctic (Georgiev *et al.* 2004).

Remarks: These specimens of Starozagorski Bani have been collected in 1961 by A. Paspaleva and mentioned by Petrova (1978) as „*Biuterina passerina* Fuhrmann, 1908". Subsequently, they are re-examined and reidentified as „*Biuterina fuhrmanni*" by Georgiev *et al.* (2004).

(43) *Biuterina triangula* (Krabbe, 1869) Fuhrmann, 1908

Report: Petrova (1978).

Hosts: *Acrocephalus arundinaceus* (L.), *Anthus trivialis* (L.), *Luscinia megarhynchos* C. L. Brehm, *Erithacus rubecula* (L.).

Locality: Stara Zagora.

General distribution: Palearctic (Matevosyan 1969; Schmidt 1986).

Genus *Dictyterina* Spasskii in Spasskaya & Spasskii, 1971

(44) *Dictyterina cholodkowskii* (Skrjabin, 1914) Spasskii in Spasskaya & Spasskii, 1971

Report: Georgiev *et al.* (1995).

Host: *Lanius collurio*.

Locality: Starozagorski Bani (Stara Zagora Region).

General distribution: Palearctic (Georgiev *et al.* 1995).

Remarks: This specimen from Starozagorski Bani has been collected in 1961 by A. Paspaleva and is not determined. Subsequently, is re-examined and identified as *„Dictyterina cholodkowskii"* by Georgiev *et al.* (1995).

Genus *Lyruterina* Spasskaya & Spasskii, 1971

(45) *Lyruterina nigropunctata* (Crety, 1890) Spasskaya & Spasskii, 1971.

Synonym: *Rhabdometra nigropunctata* (Crety, 1890) Cholodkowsky, 1906 [1, 2].

Report: Stoimenov (1961).

Host: *Coturnix coturnix*.

Locality: Sliven Region.

General distribution: Palearctic (Schmidt 1986).

Genus *Neyraia* Joyeux & Timon-David, 1934

(46) *Neyraia intricata* (Krabbe, 1878) Joyeux & Timon-David, 1934

Report: Petrova (1977).

Host: *Upupa epops* L.

Locality: Pavel Banya (Stara Zagora Region).

General distribution: Palearctic, Afrotropic and Oriental Region (Mathevossian 1969; Schmidt 1986; Georgiev & Kornyushin 1994).

Family Taeniidae Ludwig, 1886

Genus *Echinococcus* Rudolphi, 1801

(47) *Echinococcus granulosus* (Batsch, 1786) Rudolphi, 1801

Reports: [1] Todorov (1963); [2] Soilev & Boeva (1982); [3] Georgieva & Kamenov (1993); [4] Georgieva *et al.* (1997a); [5] Georgieva *et al.* (1999); [6] Todorov & Boeva (1999); [7] Kirkova *et al.* (2011); [8] Chakarova *et al.* (2015).

Hosts: *Canis aureus* [3, 4, 7]; *Canis lupus* [3, 4]; *Canis familiaris* [5]; **Homo sapiens* [1, 2, 6, 8].

Locality: Stara Zagora Region [1, 2, 3, 5, 8]; Stara Zagora [6]; Sredna Gora Mts [4]; Sredna Gora Mts (the State Forestry in Stara Zagora) [7].

General distribution: Cosmopolitan (Schmidt 1986).

Remarks: * larvae.

Genus *Taenia* Linnaeus, 1758

(48) *Taenia hydatigena* Pallas, 1766

Reports: [1] Georgieva & Kamenov (1993); [2] Georgieva *et al.* (1997a); [3] Georgieva *et al.* (1997b); [4] Georgieva *et al.* (1999).

Hosts: *Vulpes vulpes* [1, 2, 3]; *Canis aureus* [1, 2]; *Canis lupus* [1, 2]; *Canis familiaris* [4].

Locality: Stara Zagora Region [1, 4]; Sredna Gora Mts [2, 3].

General distribution: Cosmopolitan (Schmidt 1986).

(49) *Taenia multiceps* Leske, 1780

Reports: [1] Georgieva & Kamenov (1993); [2] Georgieva *et al.* (1997a); [3] Georgieva *et al.* (1997b).

Hosts: *Canis aureus* [1, 2]; *Canis lupus* [1, 2]; *Vulpes vulpes* [1, 2, 3].

Locality: Stara Zagora Region [1]; Sredna Gora Mts [2, 3].

General distribution: Cosmopolitan (Schmidt 1986).

(50) *Taenia ovis* (Cobbold, 1869) Ransom 1913

Reports: [1] Georgieva & Kamenov (1993); [2] Georgieva *et al.* (1997a).

Hosts: *Canis aureus* [1, 2]; *Canis lupus* [1, 2].

Locality: Stara Zagora Region [1]; Sredna Gora Mts [2].

General distribution: Cosmopolitan (Schmidt 1986).

(51) *Taenia pisiformis* (Bloch, 1780) Gmelin, 1790

Reports: [1] Yanchev (1963); [2] Yanchev (1965); [3] Georgieva & Kamenov (1993); [4] Georgieva *et al.* (1997a); [5] Georgieva *et al.* (1997b).

Hosts: **Lepus europaeus* [1, 2]; *Vulpes vulpes* [3, 4, 5]; *Canis aureus* [3, 4]; *Canis lupus* [3, 4].

Locality: Dalboki, Kolena, Khrishtene (Stara Zagora Region) [1], Stara Zagora Region [2, 3]; Sredna Gora Mts [4, 5].

General distribution: Cosmopolitan (Schmidt 1986).

Remarks: * larvae.

(52) *Taenia polyacantha* Leuckart, 1856

Reports: [1] Georgieva *et al.* (1997a); [2] Georgieva *et al.* (1997b); [3] Iliev *et al.* (2017a).

Hosts: *Vulpes vulpes* [1, 2]; **Rattus rattus* [3].

Locality: Sredna Gora Mts [1, 2]; Stara Zagora [3].

General distribution: Holarctic (Schmidt 1986).

**Remarks: ***larvae.

(53) *Taenia saginata* Goeze, 1782

Synonym: *Taeniarhynchys saginatus* (Goeze, 1782) Weinland, 1858.

Report: Chakarova (2004).

Host: *Homo sapiens*.

Locality: Stara Zagora Region.

General distribution: Cosmopolitan (Schmidt 1986).

(54) *Taenia taeniaeformis* (Batsch, 1786) Wolffhügel, 1911

Synonym: *Hydatigera taeniaeformis* (Batsch, 1786) Lamarck, 1816 [1].

Reports: [1] Yanchev (1965); [2] Georgieva *et al.* (1997a); [3] Georgieva *et al.* (1997b); [4] Kirkova *et al.* (2011); [5] Iliev *et al.* (2017a).

Hosts: **Apodemus sylvaticus* [1]; **Mus musculus* [1]; *Vulpes vulpes* [2, 3]; *Felis silvestris* [4]; *Martes foina* (Erxleben) [4]; **Rattus rattus* [5].

Locality: Stara Zagora Region [1]; Sredna Gora Mts [2, 3]; Sredna Gora Mts (the State Forestry in Stara Zagora) [4]; Stara Zagora [5].

General distribution: Cosmopolitan (Genov 1984; Schmidt 1986).

Remarks: *larvae; The synonymy of *Hydatigera taeniaeformis* and *Taenia taeniaeformis* has been proposed by Wolffhügel (1911).

(55) *Taenia* sp.

Reports: [1] Kirkova *et al.* (2011); [2] Iliev *et al.* (2017b); [3] Giannelli *et al.* (2017).

Hosts: *Vulpes vulpes* [1]; *Canis aureus* [1]; *Martes foina* [1]; *Canis familiaris* [2]; *Felis catus* [3].

Locality: Sredna Gora Mts (the State Forestry in Stara Zagora) [1]; Stara Zagora [2, 3].

Host-parasite checklist

Class Aves

Order Anseriformes

Family Anatidae

Anas platyrhynchos L. *f. dom.*
- *Diorchis elisae*

Anas platyrhynchos L.
- *Aploparaksis furcigera*
- *Fimbriaria fasciolaris*
- *Microsomacanthus abortiva*
- *Sobolevicanthus gracilis*
- *Tschertkovilepis krabbei*

Anas acuta L.
- *Fimbriaria fasciolaris*
- *Microsomacanthus abortiva*
- *Sobolevicanthus gracilis*

Anas clypeata L.
- *Sobolevicanthus gracilis*

Anas crecca L.
- *Fimbriaria fasciolaris*
- *Sobolevicanthus gracilis*

Anas strepera L.
- *Fimbriaria fasciolaris*

Anas querquedula L.
- *Fimbriaria fasciolaris*
- *Sobolevicanthus gracilis*

Anas penelope L.
- *Diorchis stefanskii*
- *Fimbriaria fasciolaris*

Anser albifrons (Scopoli)
- *Tschertkovilepis krabbei*

Anser anser (L.)
- *Tschertkovilepis krabbei*

Anser erythropus (L.)
- *Tschertkovilepis krabbei*

Aythya ferina (L.)
- *Sobolevicanthus gracilis*

Aythya nyroca (Güldenstädt)
- *Fimbriaria fasciolaris*
- *Tschertkovilepis krabbei*

Netta rufina (Pallas)
- *Fimbriaria fasciolaris*

Order Columbiformes

Family Columbidae

Streptopelia turtur (L.)
- *Retinometra serrata*

Order Coraciiformes
Family Coraciidae
Corasias garrulus L.
Passerilepis passeris

Order Galliformes
Family Numididae
Numida meleagris (L.)
Fimbriaria fasciolaris
Raillietina tetragona
Skrjabinia caucasica
Skrjabinia cesticillus
Family Phasianidae
Coturnix coturnix (L.)
Choanotaenia infundibulum
Lyruterina nigropunctata
Passerilepis crenata
Skrjabinia cesticillus
Skrjabinia circumvallata

Order Passeriformes
Family Cinclidae
Cinclus cinclus (L.)
Cinclotaenia tarnogradskii
Family Corvidae
Corvus cornix L.
Dilepis undula
Passerilepis crenata
Corvus monedula L.
Passerilepis stylosa
Garrulus glandarius (L.)
Passerilepis stylosa
Pica pica (L.)
Passerilepis crenata
Passerilepis stylosa
Family Emberizidae
Emberiza calandra L.
Biuterina fuhrmanni
(?) *Emberiza hortulana* L.
Angularella parachelidonariae
Family Hirundinidae
Hirundo rustica L.
Passerilepis passeris
Delichon urbica (L.)
Hirundinicola chelidonariae
Family Laniidae
Lanius collurio L.
Dictyterina cholodkowskii
Passerilepis passeris
Family Motacillidae
Anthus trivialis (L.)
Biuterina triangula

Family Muscicapidae
Muscicapa striata (Pallas)
Passerilepis passeris
Family Paridae
Parus major L.
Passerilepis passeris
Family Passeridae
Passer domesticus (L.)
Monopylidium cf. passerinum (I)
Passerilepis passeris
Passer hispaniolensis (Temminck)
Raillietina frontina
Passer montanus (L.)
Passerilepis passeris
Family Saxicolidae
Erithacus rubecula (L.)
Biuterina triangula
Luscinia megarhynchos C. L. Brehm
Biuterina triangula
Oenanthe hispanica (L.)
Passerilepis passeris
Family Sturnidae
Sturnus vulgaris L.
Passerilepis crenata
Raillietina frontina
Sobolevitaenia unicoronata
Family Sylviidae
Acrocephalus arundinaceus (L.)
Biuterina triangula
Sylvia communis Latham
Monopylidium cf. *passerinum* (II)
Family Turdidae
Turdus merula L.
Passerilepis crenata
Sobolevitaenia unicoronata
Turdus pilaris L.
Sobolevitaenia unicoronata

Order Piciformes
Family Picidae
Picus viridis L.,
Raillietina frontina
Picus canus Gmelin
Raillietina frontina
Dendrocopos syriacus (Hemprich & Ehrenberg)
Passerilepis crenata
Raillietina frontina

Order Upupiformes
Family Upupidae
Upupa epops L.
Neyraia intricata

Class Mammalia
Order Artiodactyla
Family Bovidae
Capra aegagrus hircus (L.)
Moniezia sp.
Order Carnivora
Family Canidae
Canis aureus (L.)
Dipylidium caninum
Echinococcus granulosus
Mesocestoides lineatus
Mesocestoides sp.
Taenia hydatigena
Taenia multiceps
Taenia ovis
Taenia pisiformis
Taenia sp.
Canis familiaris (L.)
Dipylidium caninum
Echinococcus granulosus
Mesocestoides lineatus
Taenia hydatigena
Taenia sp.
Canis lupus (L.)
Dipylidium caninum
Echinococcus granulosus
Mesocestoides lineatus
Taenia hydatigena
Taenia multiceps
Taenia ovis
Taenia pisiformis
Vulpes vulpes (L.)
Dipylidium caninum
Mesocestoides lineatus
Mesocestoides sp.
Taenia hydatigena
Taenia multiceps
Taenia pisiformis
Taenia polyacantha
Taenia taeniaeformis
Taenia sp.
Family Felidae
Felis catus (L.)
Dipylidium caninum
Taenia sp.
Felis silvestris Schreber
Mesocestoides lineatus
Mesocestoides litteratus
Mesocestoides sp.
Taenia taeniaeformis
Family Mustelidae
Martes foina (Erxleben)
Taenia taeniaeformis
Taenia sp.

Order Insectivora
Family Soricidae
Crocidura leucodon (Hermann)
Hilmylepis prokopiči
Staphylocystis furcata
Crocidura suaveolens (Pallas)
Hilmylepis prokopiči
Staphylocystis furcata
Sorex araneus L.
Molluscotaenia crassiscolex
Sorex minutus L.
Molluscotaenia crassiscolex

Order Lagomorpha
Family Leporidae
Lepus europaeus Pallas
Andrya rhopalocephala
Mosgovoyia pectinata
**Taenia pisiformis*

Order Primates
Family Hominidae
Homo sapiens L.
**Echinococcus granulosus*
Rodentolepis nana
Taenia saginata

Order Rodentia
Family Muridae
Apodemus agrarius Pallas
Skrjabinotaenia lobata
Apodemus flavicollis (Melchior)
Skrjabinotaenia lobata
Apodemus sylvaticus (L.)
Skrjabinotaenia lobata
Rodentolepis straminea
**Taenia taeniaeformis*
Microtus arvalis (Pall.)
Paranoplocephala montana
Paranoplocephala omphalodes
Mus musculus L.
Catenotaenia pusilla
Rodentolepis straminea
**Taenia taeniaeformis*
Rattus rattus (L.).
Hymenolepis diminuta
Rodentolepis nana
**Taenia polyacantha*
**Taenia taeniaeformis*

Discussion

As seen from the above survey, 55 cestode species were recorded from the Sarnena Sredna Gora Mts. 29 of the cestode species are from avian hosts and 26 from mammals. The cestodes recorded belong to 36 genera, 9 families and 1 order. As definitive hosts, 66 vertebrate species have been recorded. These are 46 avian and 20 mammalian species. They belong to 28 orders and 13 families. In addition, 5 of the mammalian species were also recorded as intermediate hosts of 4 cestode species (*E. granulosus*, *T. pisiformis*, *T. polyacantha* and *T. taeniaeformis*).

According to Nikolov *et al.* (2010), Binkienė *et al.* (2015), Marinova *et al.* (2015) and Marinova (2016) a total 313 cestode species from birds and mammals were recorded for the fauna of Bulgaria: 228 from birds and 85 from mammals. The cestode species from birds and mammals of Sarnena Sredna Gora Mts. represent respectively 12.7% from the species recorded from birds and 30.6% from the species recorded from mammals. We expect that this number will increase after detailed future investigations. The prerequisite for this is the large number of cestodes of birds and mammals reported in Bulgaria (Nikolov *et al.* 2010; Binkienė *et al.* 2015; Marinova *et al.* 2015; Marinova 2016), as well as the species-rich vertebrate fauna of the study area.

The majority of the species recorded in Sarnena Sredna Gora Mountains (85.5%) are characterised by large geographical ranges (Palearctic, Holarctic, Holarctic-Afrotropical, Holarctic-Oriental, Holarctic-Australian, Palearctic-Oriental, Palearctic-Paleotropical, Palearctic-Afrotropical, sub-cosmopolitan and cosmopolitan) which is probably due to the biological features of their final hosts, their diversity, migrations and extensive areas.

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Fauna of Sarnena Sredna Gora Mts, Part 1
ZooNotes, Supplement 9, 2020

Study on the Psocoptera fauna of Sarnena Gora Mts.

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Abstract. The material was collected between 2017 and 2020 during all seasons. Following methods were used: 1. Actively searched in proper habitats, and collected by wet brush; 2. Sieving with 1 mm mesh width sieve of detritus or crushed tree bark particles above white plastic container; 3. Beating the vegetation above white plastic container; 4. Checking for dead individuals in spider webs or paddles full with water; 5. Sweep netting of vegetation; 6. Trapping by white plastic containers placed below lamps. There were 9 species of Psocoptera known from Sarnena Gora Mts. till present study. After the detailed research a total of 35 species of Psocoptera are known to occur in the area (26 newly recorded species). The species *Ectopsocus petersi* was a new record for Bulgaria.

Key words: Insecta, Psocoptera, localities.

Introduction

There were 9 species of Psocoptera known from Sarnena Gora Mts., all reported by the author (Georgiev 2016, 2017a, 2017b, 2018): *Lepinotus reticulatus* Enderlein, 1905, *Lepinotus inquilinus* Heyden, 1850, *Liposcelis bostrychophila* Badonnel, 1931, *Liposcelis pearmani* Lienhard, 1990, *Liposcelis priesneri* Enderlein, 1925, *Liposcelis silvarum* (Kolbe, 1888), *Lachesilla bernardi* Badonnel, 1938, *Ectopsocus vachoni* Badonnel, 1945, and *Cuneopalpus cyanops* (Rostock, 1876).

Here I summarize all published data and present some new records of barkfly species and their localities in this area.

Material and Methods

The material was collected between 2016 and 2020 by following methods: 1. Actively searched in proper habitats, and collected by wet brush; 2. Sieving with 1 mm mesh width sieve of detritus or crushed tree bark particles above white plastic container; 3. Beating the vegetation above white plastic container; 4. Checking for dead individuals in spider webs or paddles full with water (Fig. 1); 5. Sweep netting of vegetation; 6. Trapping by white plastic containers placed below lamps. Specimens were then stored in ethanol and after processing, deposited in the collection of the author. Most of the material was collected by the author. Some samples were provided and by Assist. Prof. Miroslav Antov (Plovdiv University), which is mentioned in the text.

Species identification and taxonomical order follow Lienhard (1998) and Lienhard & Smithers (2002). As a supporting source, Saville (2008) was also used.

Fig. 1. One of the richest collecting sites (natural water trap): rock paddles, N of Nova Zagora town, E of Kriva Krusha vill. (picture taken on 4.6.2020).

Results

A total of 35 species of Psocoptera are known to occur in Sarnena Gora Mts. after this study:

Trogiidae

***Lepinotus reticulatus* Enderlein, 1905**

Reported by Georgiev (2016): "*24.09.2016, Bulgaria, Sarnena Gora Mts., S slope, E of Stara Zagora city, near Hrishteni village, Pine plantation (Pinus nigra), N42 28 02.7 E25 42 59.0, 306 m a.s.l., in detritus (decaying needles and small brunches of Pinus nigra), 1 ♀, collected by sieving.*"

Other material examined: 22.9.2016, Hrishteni village, yard of a house, in detritus of *Corylus avellana*, N42 27 12.56 E25 42 17.89, 231 m a.s.l., 1 ♀, collected by sieving; 9.3.2017, same locality, in a room in house, 1 ♀, on a laptop; 24.9.2016, E of Hrishteni vill., grass and bush area at the periphery of agricultural lands, grass detritus under *Rosa* sp., N42 27 38.3 E25 43 07.9, 234 m a.s.l., 2 ♀, 1 nymph, collected by sieving; 6.10.2016, near Trakia University, *Pinus nigra* plantation, dry trunk of *P. nigra*, 1 ♀, 2 nymphs, collected by sieving; 10.4.2017, S of Kolena vill., Medven Hill, the area at the peak, grass and bush *Paliurus spina-christi*, detritus at the base of a rock, N42 27 13.6 E25 43 55.0, 283 m a.s.l., 1 ♀, collected by sieving; 10.4.2017, S of Kolena vill., Medven Hill, mixed forest, in a dead trunk of *Pinus nigra*, N42 27 19.4 E25 43 53.7, 249 m a.s.l., 1 ♀, collected by sieving; 16.5.2017, N of Stara Zagora city, near Bedechka River, river bank forest, in a dead trunk of *Cerasus sativa*, N42 27 06.9 E25 37 54.8, 227 m a.s.l., 1 ♀, collected by sieving; 4.9.2017, Stara Zagora city, park forest, brunches of *Cedrus* sp., N42 26 12.7 E25 38 19.1, 300 m a.s.l., 1 ♀, collected by beating the vegetation; 7.6.2018, near the path to Moruley Peak, *Pinus sylvestris* plantation, ant nest, N42 32 06.3 E25 45 44.9, 696 m a.s.l., 2 ♀, collected

by sieving; 28.5.2018, near Beter Peak, *Quercus* sp. forest, ant nest, N42 30 46.4 E25 37 46.6, 789 m a.s.l., 2 ♀, collected by sieving; 29.4.2020, Hadzhiolova Koria Hill, W of Hrishteni vill., abandoned yard, bark of dry *Malus domestica*, N42 27 01.4 E25 41 47.7, 241 m a.s.l., 1 ♀, collected by sieving.

***Lepinotus inquilinus* Heyden, 1850**

Reported by Georgiev (2017b): "*22.9.2016, Hrishteni village, yard of a house, in detritus of Corylus avellana, N42 27 12.56 E25 42 17.89, 231 m a.s.l., 1 ♀, collected by sieving.*"

Psyllipsocidae

***Psyllipsocus ramburii* Selys-Longchamps, 1872**

Material examined: 17.9.2016, Hrishteni village, house, N42 27 12.99 E25 42 18.54, 231 m a.s.l., 1 ♀, micropterous, on wall; 8.10.2016, same locality, in toilet, 1 ♀, micropterous, found drinking water from a drop in a sink (Fig. 2); 22.5.2017, same locality, in storeroom, 1 ♀, micropterous, on stored potatoes.

Fig. 2. *Psyllipsocus ramburii*, drinking water from a drop in a sink, a house in Hrishteni vill.

Liposcelididae

***Liposcelis bostrychophila* Badonnel, 1931**

Reported by Georgiev (2017b): "*26.3.2017, south of Kolena village, below Medven Peak, Quercus spp. and Carpinus orientalis forest, in detritus of Quercus sp., N42 27 06.4 E25 43 51.9, 222 m a. s. l., 1 ♀, collected by sieving.*"

Other material examined: 10.4.2017, south of Kolena village, Medven Hill, bushes dominated by *Quercus* sp., *Carpinus orientalis* and *Paliurus spina-christi*, dead trunk of *Quercus* sp., N42 27 22.7 E25 43 52.5, 206 m a.s.l., 2 ♀, collected by sieving; same date and area, in dead trunk of *Fraxinus* sp., N42 27 15.0 E25 43 56.8, 272 m a.s.l., 1♀, collected by sieving; 29.4.2020, Hadzhiolova Koria Hill, W of Hrishteni vill., abandoned yard, bark of dry *Malus domestica*, N42 27 01.4 E25 41 47.7, 241 m a.s.l., 1 ♀, collected by sieving.

***Liposcelis corrodens* (Heymons, 1909)**

Material examined: 26.5.2018, S of Shanovo vill., meadows with bushes and trees, in bark of live *Quercus* sp., N42 31 52.1 E25 38 42.7, 424 m a.s.l., 1♀, collected by sieving; 29.4.2020, Hadzhiolova Koria Hill, W of Hrishteni vill., abandoned yard, bark of dry *Malus domestica*, N42 27 01.4 E25 41 47.7, 241 m a.s.l., 1 ♀, collected by sieving; 17.5.2020, near Kavaklyika Hut, mixed forest: *Fagus sylvatica*, *Picea abies* and *Pinus sylvestris*, in bark of dead trunk of *Picea abies*, N42 29 08.0 E25 13 35.3, 903 m a.s.l., 1♀, collected by sieving.

***Liposcelis decolor* (Pearman, 1925)**

Material examined: 18.9.2016, Hrishteni village, house, N42 27 12.99 E25 42 18.54, 231 m a.s.l., 1 ♀, in a room; 13.6.2018, same locality, outside the house, 1 ♀, under light.

***Liposcelis pearmani* Lienhard, 1990**

Reported by Georgiev (2017a): "*24.9.2016, East of Hrishteni village, Pinus nigra plantation, pine detritus and dead wood, 42°28'02.7"N 25°42'59.0"E, 306 m a.s.l., 1* ♀."

Other material examined: 26.3.2017, S of Kolena vill., *Quercus* sp. and *Carpinus orientalis* forest, detritus and a dead trunk of *Quercus* sp., N42 27 06.4 E25 43 51.9, 222 m a.s.l., 2 ♀, collected by sieving; 10.4.2017, S of Kolena vill., *Quercus* sp. and *Carpinus orientalis* forest, trunk of *Fraxinus* sp., N42 27 15.0 E25 43 56.8, 272 m a.s.l., 1 ♀, collected by sieving; 21.4.2017, Hrishteni village, in a barn, among old stored grain, N42 27 13.08 E25 42 19.37, 231 m a.s.l., 2 ♀, collected by sieving; 23.5.2017, N of Kolena vill., *Quercus* sp. and *Carpinus orientalis* forest, trunk of *Juglans regia*, N42 29 12.2 E25 43 21.6, 287 m a.s.l., 1 ♀, collected by sieving; 11. and 13.6.2018, Hrishteni village, under light, N42 27 12.79 E25 42 18.47, 231 m a.s.l., 3 ♀, collected by white plastic collectors under light; 7.6.2018, near the path to Moruley Peak, *Pinus silvestris* forest, in ant nest, N42 32 06.3 E25 45 44.9, 696 m a.s.l., 1 ♀, collected by sieving; 28.5.2018, near Beter Peak, *Quercus* sp. forest, in ant nest, N42 30 46.4 E25 37 46.6, 789 m a.s.l., 1 ♀, collected by sieving.

***Liposcelis priesneri* Enderlein, 1925**

Reported by Georgiev (2017a): "*22.9.2016, Hrishteni village, yard of a house, detritus beneath Corylus avellana, N42 27 12.56 E25 42 17.89, 231 m a.s.l., 2* ♀."

***Liposcelis silvarum* (Kolbe, 1888)**

Reported by Georgiev (2017a): "*pine forest near Trakia University (W of Stara Zagora city, additional record)*". The accurate collection data is: 6.10.2016, near Trakia University, *Pinus nigra* plantation, dead trunk of *Pinus nigra*, N42 24 08.4 E25 34 08.0, 298 m a.s.l., 3 ♀, collected by sieving.

Epipsocidae

***Bertkauia lucifuga* (Rambur, 1842)**

Material examined: 19.9.2018, near Borilovo vill., small meadows with various bushes and trees, in detritus of *Juglans regia*, N42 28 46.8 E25 33 56.2, 429 m a.s.l., 1 ♀, 1 nymph, collected by sieving.

Caeciliusidae

***Valenzuela flavidus* (Stephens, 1836)**

Material examined: 22.6.2018 and 7.8.2018, Hrishteni village, yard of a house, N42 27 12.7 E25 42 18.9, 230 m a.s.l., 2♀, collected by trapping with plastic containers below lamp during the night; 2.7.2018, W of Yagoda vill., grass and bushes, from various bush species, N42 32 20.8 E25 33 34.7, 290 m a.s.l., 1♀, collected by beating the vegetation; 5.7.2018, E of Edrevo vill., bushes and trees, brunches of *Quercus* sp., N42 35 37.1 E25 49 14.2, 303 m a.s.l.,1♀, collected by beating the vegetation; 5.7.2018, E of Panicherevo vill., near Zhrebchevo Dam, N42 35 37.7 E25 51 46.5, 261 m a.s.l., 1♀, collected by beating the vegetation; 3.6.2020, S of Zlati Voyvoda vill., tree and bush vegetation along dry stream among agricultural lands and meadows, brunches of *Crataegus* sp., N42 34 56.1 E26 11 55.5, 222 m a.s.l., 1♀, collected by beating the vegetation; 4.6.2020, E of Kriva Krusha vill., mixed broad leaf forest, N42 33 37.9 E25 55 11.1, 404 m a.s.l., 1♀, collected from water in a paddle on a dirt road.

***Valenzuela piceus* (Kolbe, 1882)**

Material examined: 15.10.2016, W of Kolena vill., *Pinus nigra* plantation, brunches of *Pinus nigra*, N42 28 58.5 E25 42 20.2, 263 m a.s.l., 1♂, 1♀, collected by beating the vegetation; 11.3.2018, S slope of Medven Hill, meadow among bushes, from dry grass, N42 27 03.4 E25 43 48.2, 221 m a.s.l., 1♀, collected by sweep netting; 9.5.2018, Hrishteni village, yard of a house, from *Clemathis vitalba*, N42 27 12.7 E25 42 18.9, 231 m a.s.l., 1♂, collected by beating the vegetation; 22.3.2020, S of Kolena vill., east periphery of Medven Hill, dry grass between mixed forest and agricultural lands, N42 27 25.58 E25 44 12.84, 196 m a.s.l., 1♀, found accidently on white sheet during collecting Ixodidae.

Stenopsocidae

***Graphopsocus cruciatus* (Linnaeus, 1768)**

Material examined: 5.10.2016, near Dabrava vill., grass and bushes, brunches of *Quercus* sp., N42 27 29.8 E25 35 32.9, 545 m a.s.l., 1 ♂, 1 nymph, collected by beating the vegetation; same date and locality, brunch of *Carpinus orientalis*, 1 nymph, collected by beating the vegetation; 13.10.2016, near Malka Vereya vill., grass and bushes, brunches of *Crataegus* sp., N42 24 37.71 E25 33 10.60, 380 m a.s.l., 4 ad., 1 nymph, collected by beating the vegetation; 2.7.2018, W of Yagoda vill., grass and bushes, brunches of *Crataegus* sp., N42 32 20.8 E25 33 34.7, 290 m a.s.l., 1 ♀, collected by beating the vegetation; 5.7.2018, E of Edrevo vill., grass and bushes with single trees, brunches of *Quercus* sp., N42 35 37.1 E25 49 14.2, 303 m a.s.l., 1 ♀, collected by beating the vegetation; 5.7.2018, E of Panicherevo vill., near Zhrebchevo Dam, grass and bushes with single trees, brunches of *Pyrus communis*, N42 35 37.7 E25 51 46.5, 261 m a.s.l., 1 ♀, collected by beating the vegetation; 25.10.2018, W of Lyulyak vill., grass and bushes with single trees, from *Clemathis vitalba*, N42 30 36.4 E25 40 17.0, 414 m a.s.l., 1 ♀, collected by beating the vegetation; 24.10.2018, N of Stara Zagora city, Ayazmoto Park, *Pinus nigra* plantation, from unidentified bushes, N42 26 17.2 E25 36 21.0, 368 m a.s.l., 1 ♂, collected by beating the vegetation; 28.8.2019, near Kavakyika Hut, grass and bushes with single trees, brunch of *Pyrus pyraster*, N42 29 05.5 E25 13 28.4, 943 m a.s.l., 1 ♂, collected by beating the vegetation.

Amphipsocidae

***Kolbia quisquiliarum* Bertkau, 1882**

Reported by Georgiev (2018): "*1 ♂, 23.5.2018, Sarnena Gora Mts., N of Dabrava village, broad leaf xeric forest, dominated by Quercus spp. and Carpinus spp. with a lot of meadows, collected by sweep netting from grass vegetation dominated by Poaceae, N42 27 30.3 E25 35 37.0, 516 m a.s.l.*"

Lachesiliidae

***Lachesilla pedicularia* (Linnaeus, 1758)**

Material examined: 13. and 14.6.2018, Hrishteni village, yard of a house, N42 27 12.7 E25 42 18.9, 230 m a.s.l., 1 ♀, 1 ♂, collected by trapping with plastic containers below lamp during the night; 2.7.2018, W of Yagoda vill., grass and bushes near small stream, from *Humulus lupulus*, N42 32 20.8 E25 33 34.7, 290 m a.s.l., 1♂, collected by beating the vegetation; 24.8.2018, near Zmeevo vill., meadow, from *Dichantium ischaemum*, N42 30 02.7 E25 37 32.8, 490 m a.s.l., 1 ♀, collected by sweep netting, M. Antov leg.; 24.10.2018, W side of the Ayazmoto Park, N of Stara Zagora city, *Pinus nigra* plantation, from various bushes, N42 26 17.2 E25 36 21.0, 368 m a.s.l., 1 ♀, collected by beating the vegetation.

***Lachesilla bernardi* Badonnel, 1938**

Reported by Georgiev (2018): "*1 ♂, 23.5.2018, Sarnena Gora Mts., Hrishteni village, yard of a house, collected by sweeping of Corylus avellana leafs using a small plastic container (small bucket), N42 27 12.7 E25 42 18.9, 230 m a.s.l.; same locality: 1 ♂, 14.6.2018, collected by trapping with plastic containers below lamp during the night; 1 ♂, 29.6.2018, Sarnena Gora Mts., SW part of Hrishteni village, ruderal vegetation, collected by beating the vegetation, from Clemathis vitalba growing on a concrete wall, N42 27 00.0 E25 42 12.1, 222 m a.s.l.*"

Other material examined: 25.8.2018, Starozagorski Bani resort, possibly from grass vegetation, N42 27 27.2 E25 28 36.8, 411 m a.s.l., 1♂, collected by sweep netting, M. Antov leg.; 7.3.2020, E of Kriva Krusha vill., rocky terrain with a lot of *Syringia* sp. bushes, N42 33 38.4 E25 55 30.2, 518 m a.s.l., 1♂, collected from water in small rock wholes (Fig. 1); 4.6.2020, same locality, 1♂.

***Lachesilla quercus* (Kolbe, 1880)**

Material examined: 20.9.2018, N of Lyulyak vill., *Quercus* sp. forest, from *Poaceae* grasses, N42 30 58.3 E25 39 58.5, 449 m a.s.l., 1♀, collected by sweep netting.

Ectopsocidae

***Ectopsocus briggsi* McLachlan, 1899**

Material examined: 2.7.2018, W of Yagoda vill., grass and bushes near small stream, from *Humulus lupulus*, N42 32 20.8 E25 33 34.7, 290 m a.s.l., 2♂, collected by beating the vegetation; 26.4.2020, Hadzhiolova Koria Hill, W of Hrishteni vill., ruderal habitat near a dunghill, from brunches of big *Salix* sp. tree, N42 27 01.1 E25 41 48.8, 262 m a.s.l., 1♂, collected by sweep netting.

***Ectopsocus meridionalis* Ribaga, 1904**

Material examined: 5.7.2018, E of Panicherevo vill., near Zhrebchevo Dam, grass and bushes with single trees, brunches of *Pyrus communis*, N42 35 37.7 E25 51 46.5, 261 m a.s.l., 1♀, collected by beating the vegetation; 19.9.2018, near Borilovo vill., grass and bushes, from mixture of bushes (*Crataegus* sp., *Clemathis vitalba*, *Prunus cerasifera*), N42 28 46.8 E25 33 56.2, 429 m a.s.l., 1♀, collected by beating the vegetation; W of Lyulyak vill., bushes and trees, from *Clemathis vitalba*, N42 30 36.4 E25 40 17.0, 414 m a.s.l., 1♀, collected by beating the vegetation; 7.3.2020, E of Kriva Krusha vill., rocky terrain with a lot of *Syringia* sp. bushes, N42 33 38.4 E25 55 30.2, 518 m a.s.l., 1♀, collected from water in small rock wholes (Fig. 1); 28.4.2020, S of Hrishteni vill., bushes along an irrigation canal, from *Crataegus* sp., N42 26 46.8 E25 42 11.8, 198 m a.s.l., 1♀, collected by beating the vegetation.

***Ectopsocus petersi* Smithers, 1978**

Material examined: 9.1.2020, Hrishteni village, yard of a house, on *Euonymus japonica* bush, N42 27 12.56 E25 42 17.89, 231 a.s.l., 1 ♀ (Fig. 3), collected by beating the vegetation (and 1 ♀ cf *petersi* observed flying near same location on 4.1.2020); 7.3.2020, E of Kriva Krusha vill., rocky terrain with a lot of *Syringia* sp. bushes, N42 33 38.4 E25 55 30.2, 518 m a.s.l., 1♀, 2♂, collected from water in small rock wholes (Fig. 1); 28.4.2020, S of Hrishteni vill., bushes along an irrigation canal, from *Crataegus* sp., N42 26 46.8 E25 42 11.8, 198 m a.s.l., 1♀, collected by beating the vegetation.

Remark: New record for Bulgaria and interesting finding during winter (night temperatures in January 2020 dropped to about -5° C).

Fig. 3. *Ectopsocus petersi*, ♀, Hrishteni village, yard of a house, collected from *Euonymus japonica* bush. New record for Bulgaria.

***Ectopsocus vachoni* Badonnel, 1945**

Reported by Georgiev (2017a): "*24.9.2016, East of Hrishteni village, edge of a corn field, grass detritus beneath Rosa sp., N42 27 38.3 E25 43 07.9, 234 m a.s.l., 1 ♀; 13.10.2016, North of Malka Vereya village, mixed broad leaf forest, in mixed leaf detritus of Acer tataricum, Prunus spinosa, Tilia sp., Acer campestre, Quercus sp., N42 24 50.87 E25 32 54.08, 380 m a.s.l., 2 nymphs.*"

Elipsocidae

***Cuneopalpus cyanops* (Rostock, 1876)**

Reported by Georgiev (2017a): "*West of Kolena village, Pinus nigra plantation, branches of Pinus nigra, 42°28'58.5"N 25°42'20.2"E, 263 a.s.l., 15.x.2016, 3♂♂, 1♀.*"

Other material examined: 5.7.2018, E of Panicherevo vill., near Zhrebchevo Dam, grass and bushes with single trees, near *Pinus nigra* plantation, brunches of *Pyrus communis*, N42 35 37.7 E25 51 46.5, 261 m a.s.l., 1♀, collected by beating the vegetation; 19.9.2018, near Borilovo vill., grass and bushes, from mixture of bushes (*Crataegus* sp., *Clemathis vitalba*, *Prunus cerasifera*), N42 28 46.8 E25 33 56.2, 429 m a.s.l., 1♂, 2♀, collected by beating the vegetation; 24.10.2018, W side of the Ayazmoto Park, N of Stara Zagora city, *Pinus nigra* plantation, from various bushes, N42 26 17.2 E25 36 21.0, 368 m a.s.l., 1♂, 1♀, collected by beating the vegetation.

***Elipsocus abdominalis* Reuter, 1904**

Reported by Georgiev (2018): "*1 ♂, 18.10.2017, Sarnena Gora Mts., Hrishteni village, yard of a house, found dead below window, N42 27 12.7 E25 42 18.9, 230 m a.s.l.*"

***Elipsocus annulatus* Roesler, 1954**

Reported by Georgiev (2018): "*1 ♂, 28.5.2018, Sarnena Gora Mts., close to Beter Peak, broad leaf xeric forest, dominated by Quercus spp., Carpinus spp., and Acer spp., collected by sweep netting, from grass vegetation dominated by Paeonia sp., N42 30 41.2 E25 37 46.4, 809 m a.s.l.*"

***Elipsocus moebiusi* Tetens, 1891**

Material examined: 20.6.2018, Hrishteni vill., yard of a house, N42 27 12.7 E25 42 18.9, 231 m a.s.l., 1♂, collected by trapping with plastic containers below lamp during the night; 25.10.2018, W of Lyulyak vill., bushes and trees, from *Clemathis vitalba*, N42 30 36.4 E25 40 17.0, 414 m a.s.l., 1♀, collected by beating the vegetation; 3.6.2020, S of Zlati Voyvoda vill., tree and bush vegetation along dry stream among agricultural lands and meadows, brunches of *Salix* sp., N42 34 56.1 E26 11 55.5, 222 m a.s.l., 1♀, collected by beating the vegetation; 4.6.2020, E of Kriva Krusha vill., rocky terrain with a lot of *Syringia* sp. bushes, N42 33 38.4 E25 55 30.2, 518 m a.s.l., 7 ♀, 11♂, collected from water in small rock wholes (Fig. 1).

***Elipsocus pumilis* (Hagen, 1861)**

Material examined: 13.10.2016, North of Malka Vereya village, bush and grass terrain, branches of *Crataegus* sp., N42 24 37.71 E25 33 10.60, 380 m a.s.l., 1♂, 1♀, collected by beating the vegetation.

***Hemineura dispar* Tetens, 1891 – species complex**

Material examined: 9.12.2018, N of Kolena vill., near Kumurdzha River, mixed broad leaf forest, from window of a car, N42 29 11.35 E25 43 20.18, 270 m a.s.l., 1♂, collected by hand; 12.11.2018, Hrishteni village, yard of a house, on a net of a window, N42 27 12.7 E25 42 18.9, 230 m a.s.l., 1♂, collected by hand; 19.11.2018, same locality, 1♂, collected by trapping with plastic containers below lamp during the night.

Remark: females are needed to identify the species from the "*dispar*" complex.

Mesopsocidae

***Mesopsocus immunis* (Stephens, 1836)**

Reported by Georgiev (2017a): "*North of Malka Vereya village, bush and grass terrain, branches of Crataegus sp., 42°24'37.71"N 25°33'10.60"E, 380 a.s.l., 13.x.2016, 1* ♀."

***Mesopsocus unipunctatus* (Müller, 1764)**

Material examined: 11.6.2018, N of Bogomilovo vill., *Quercus* sp., *Carpinus betulus* and *Tilia* sp. forest, grass vegetation, N42 24 49.8 E25 32 49.4, 389 m a.s.l., 1♂, collected by sweep netting.

Peripsocidae

***Peripsocus alboguttatus* (Dalman, 1823)**

Material examined: 19.9.2018, near Borilovo vill., grass and bushes, from mixture of bushes (*Crataegus* sp., *Clemathis vitalba*, *Prunus cerasifera*), N42 28 46.8 E25 33 56.2, 429 m a.s.l., 1♂, 1♀, collected by beating the vegetation; 23.10.2018, S of Ostra Mogila vill., forest near Sazlyika River, from *Urtica* sp., N42 27 10.1 E25 28 27.5, 604 m a.s.l., 1♀, collected by beating the vegetation

***Peripsocus phaeopterus* (Stephens, 1836)**

Material examined: 2.7.2018, W of Yagoda vill., grass and bushes near small stream, from *Humulus lupulus*, N42 32 20.8 E25 33 34.7, 290 m a.s.l., 1♂, collected by beating the vegetation.

Psocidae

***Amphigerontia contaminata* (Stephens, 1836)**

Material examined: 4.6.2020, E of Kriva Krusha vill., rocky terrain with a lot of *Syringia* sp. bushes, N42 33 38.4 E25 55 30.2, 518 m a.s.l., 1♂, collected from water in small rock wholes (Fig. 1).

***Blaste conspurcata* (Rambur, 1842)**

Material examined: 25.8.2018, Starozagorski Bani resort, possibly from grass vegetation, N42 27 28.8 E25 29 32.5, 411 m a.s.l., 1♀, collected by sweep netting, M. Antov leg.

***Metylophorus nebulosus* (Stephens, 1836)**

Material examined: 1.9.2018, N of Lyulyak vill., abandoned quarry, on *Poaceae* grass, N42 31 24.2 E25 40 35.6, 564 m a.s.l., 1♂, collected by sweep netting.

***Neopsocus rhenanus* Kolbe, 1882**

Material examined: 25.11.2018, Hrishteni village, yard of a house, N42 27 12.7 E25 42 18.9, 230 m a.s.l., 1 ♀, 1 nymph, collected by trapping with plastic containers below lamp during the night; 31.1.2019, same locality and method, 1 ♀.

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Fauna of Sarnena Sredna Gora Mts, Part 1
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Ground beetles (Coleoptera: Carabidae) from the Sarnena Sredna Gora Mts

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Abstract. The present study compiles a list of Carabidae species from the Sarnena Sredna Gora Mts. The species list is completed on the basis of the material collected during field trips in 2018 – 2020, and the available bibliographic data. A total of 175 species are found, including 14 endemic species and subspecies, three relicts, and some rare and stenotopic species. They belong to 59 genera and 21 tribes. This represents, respectively, 23% of all established for Bulgarian carabid fauna species, 47% of the genera and 57% of the tribes. The richest tribes are Harpalini (50 species), Pterostichini (25 species), Amarini (18 species), Lebiini (15 species), and Carabini (12 species). Remarkably, 139 of the collected species are new for this part of the mountain. The insufficient research in the area and the large carabid species richness suggest that future targeted studies would contribute to the enrichment of the species list presented here. Zoogeographical analysis shows that the European and the Mediterranean complexes prevail.

Key words: carabids, Sarnena Gora, check list.

Introduction

Sarnena Sredna Gora Mts (Sarnena Gora) is the easternmost part of the Sredna Gora Mts. It falls on the border of two biogeographical regions and three subregions (Gruev 1988). The higher ridges of the Sarnena Gora refer to the low-mountain belt of the Stara Planina Subregion of the Mountain Biogeographical Region. The low and peripheral parts of the Sarnena Gora refer to the subregions of the Upper Thracian and Tundzha Hilly Lowlands from the Middle Bulgarian Biogeographical Region. The rivers of Blatnitsa and Sazliyka are the border between these two subregions. The southern pre-mountain hills of the Sarnena Gora, the Chirpan Heights and the Korten ridge are included in the first subregion, and the easternmost lower parts of the mountain, on the east of the Zlati Voyvoda vill., and to the turn of the Tundzha River at Zaychi Vrah Peak, and all northern slopes bordering Slivensko Pole, Tvardishko Pole and Kazanlashko Pole Podbalkan fields, fall under the Tundzha Subregion.

Geographical location, relief, edaphic conditions and specific climatic factors in the Sarnena Sredna Gora Mts suggest an exceptional variety of habitats (oak forests, beech forests, coniferous plantations, broadleaf plantations, bushes, riparian woods and bushes, dry, mesophilous and hygrophilous grasslands, pastures, inland standing and running surface waters, as well as some artificial landscapes – villages, chalets, agrocoenoses, etc. All this suggests the occurrence of diverse ground beetle (Coleoptera: Carabidae) forms and complexes. The relative proximity of the region to the Black Sea, Asia Minor and the Mediterranean, combined with the migration corridors and peculiar refugia of the river systems of the Maritsa and Tundzha Rivers, are a prerequisite for a strongly increased

presence of southern Pontic, Anatolian and Mediterranean species. The proximity of the Central Balkan Mts and Sashtinska Sredna Gora Mts probably influenced the formation of a specific mountainous faunistic complex, including elements of the middle-mountain mesophilous carabid fauna with an increased presence of northern psychrophilic and freeze-tolerant forms, as well as many endemics.

Ground beetles are relatively well studied in Bulgaria, and from the beginning of the 20th century until now, many authors have published data concerning the carabid fauna of the region of the whole Sredna Gora Mts. So far, 160 species (26% of all Bulgarian Carabidae species) are to be found there (Teofilova & Guéorguiev *in prep.*). Unfortunately, the data about the ground beetles of its eastern part – Sarnena Sredna Gora Mts, are scarce and include records of only 36 species (Yoakimov 1904, Nedelkov 1909, Buresh & Kantardzhieva 1928, Hieke & Wrase 1988, Guéorguiev *et al.* 1997).

The aim of the present study is to compile a list of Carabidae species from the Sarnena Sredna Gora Mts, a region that has never been subjected to detailed faunal investigations.

Material and Methods

The species list is completed on the basis of the material collected during field trips and the available bibliographic data. Field work was carried out in 2017 – 2020. Ground beetles were collected with pitfall traps, hand picking and light attraction. The pitfall traps were of two types: small (made of 500 ml beakers) and big (cut plastic bottles with 2 l volume and diameter of the enter hole about 12 cm), buried at the level of the substrate.

The sampling sites, collectors, number of the traps and fixation fluids are given in Table 1 and sampling sites localities are presented on Figure 1. Additional single collections are given in the species list.

The systematic list follows Kryzhanovskij *et al.* (1995).

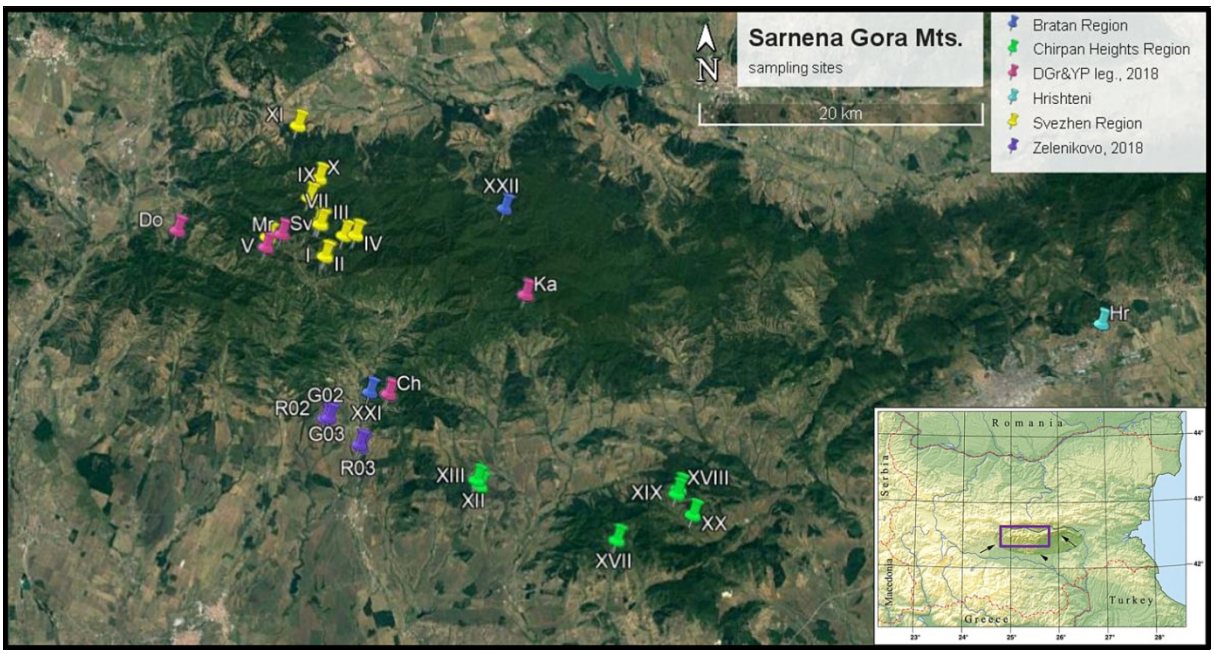

Fig. 1. Map of the locations of the main sampling sites in Sarnena Gora (handpicking localities are not included).

Table 1. List of the sampling sites, with their code, average altitude, coordinates (GPS), description, collectors, methods and dates of visiting.

Code	Locality and altitude a.s.l.	GPS	Habitat	Sampling dates and methods [number of traps, fixative]
2019–2020, leg. Teodora Teofilova (TT) & Nikolay Kodzabashev (NK)				
Svezhen Region				
I	E Svezhen vill. 865 m	42°29'48''N 25°02'54''E	Actively grazed **pasture** at the southern foot of the Chatal Darvo Peak, with single bushes and trees	22.III–7.VII *[1]*, 7.VII–11.XI.2019 *[2]*, 11.XI.2019–9.V.2020 *[3]* [5 traps, formaldehyde]
II	E Svezhen vill. 863 m	42°29'50''N 25°02'57''E	Old **coniferous** Scots pine and Norway spruce **plantation** at the southern foot of the Chatal Darvo Peak, with single trees of beech, birch and black locust	22.III–7.VII *[1]*, 7.VII–11.XI.2019 *[2]*, 11.XI.2019–9.V.2020 *[3]* [6 traps, formaldehyde]
III	E Hut Svezhen 1100 m	42°30'35''N 25°03'51''E	Mesophilous **ridge beech forest** with many old trees	22.III–7.VII *[1]*, 7.VII–11.XI.2019 *[2]*, 11.XI.2019–9.V.2020 *[3]* [6 traps, formaldehyde]
IV	E Hut Svezhen 975 m	42°30'36''N 25°04'26''E	**Old beech forest**, near large non-drying up puddle on the mountain road	22.III–7.VII *[1]*, 7.VII–11.XI.2019 *[2]*, 11.XI.2019–9.V.2020 *[3]* [6 traps, formaldehyde]
V	W Svezhen vill. 860 m	42°30'31''N 24°59'59''E	Mesoxerothermic **oak forest** on the road to Hadzhi Dimitar's Grave Place	22.III–7.VII *[1]*, 7.VII–11.XI.2019 *[2]*, 11.XI.2019–9.V.2020 *[3]* [6 traps, formaldehyde]
VI	1 km NW Hut Svezhen, 1022 m	42°31'03''N 25°02'40''E	**Ridge beech forest** with many old trees	22.III–7.VII *[1]*, 7.VII–11.XI.2019 *[2]*, 11.XI.2019–9.V.2020 *[3]* [6 traps, formaldehyde]
VII	1 km NW Hut Svezhen 1015 m	42°30'60''N 25°02'38''E	Ridge **coniferous plantation** of Scots pine, spruce and Douglas-fir, with single trees of beech, overgrown with eagle fern	22.III–7.VII *[1]*, 7.VII–11.XI.2019 *[2]*, 11.XI.2019–9.V.2020 *[3]* [6 traps, formaldehyde]
VIII	NW Hut Svezhen 1008 m	42°31'03''N 25°02'31''E	Actively grazed **ridge pasture**, surrounded by forests	22.III–7.VII *[1]*, 7.VII–11.XI.2019 *[2]*, 11.XI.2019–9.V.2020 *[3]* [6 traps, formaldehyde]
IX	5 km NW Hut Svezhen 898 m	42°31'59''N 25°02'05''E	**Mixed forest** of oak, beech and hornbeam, at the upper limit of the oak and the lower limit of the beech	22.III–7.VII *[1]*, 7.VII–11.XI.2019 *[2]*, 11.XI.2019–9.V.2020 *[3]* [6 traps, formaldehyde]
X	S Osetenovo vill. 670 m	42°32'43''N 25°02'32''E	**River bank** of Turiyska Reka River near dank glade with oaks, cornels and white willows	22.III–7.VII *[1]*, 7.VII–11.XI.2019 *[2]*, 11.XI.2019–9.V.2020 *[3]* [6 traps, formaldehyde]
XI	S Osetenovo vill. 633 m	42°34'12''N 25°01'36''E	**Oak forest** with numbers of large tufts of butcher's-broom (*Ruscus aculeatus*)	22.III–7.VII *[1]*, 7.VII–11.XI.2019 *[2]*, 11.XI.2019–9.V.2020 *[3]* [6 traps, formaldehyde]
Chirpan Heights Region				
XII	NW Veren vill. 366 m	42°21'33''N 25°10'37''E	**Black locust plantation** on sandy soil	23.III–8.VII *[1]*, 8.VII–10.XI.2019 *[2]*, 10.XI.2019–12.IV.2020 *[3]* [6 traps, formaldehyde]
XIII	NW Veren vill. 353 m	42°21'19''N 25°10'47''E	**Pasture with Jerusalem thorn** (*Paliurus spina-christi*) and many tufts of prickly pear (*Opuntia* sp.), near cedar (*Cedrus* sp.) plantation	23.III–8.VII *[1]*, 8.VII–10.XI.2019 *[2]*, 10.XI.2019–12.IV.2020 *[3]* [7 traps, formaldehyde]
XIV	S Saedinenie vill. 386 m	42°21'01''N 25°17'47''E	**Mixed riverine forest** of poplars, elms, black pine and black locust, with *Ruscus*, *Viburnum* sp., wild vine and ivy	23.III–8.VII *[1]*, 8.VII–10.XI.2019 *[2]*, 10.XI.2019–12.IV.2020 *[3]* [6 traps, formaldehyde]
XV	S Saedinenie vill. 487 m	42°20'39''N 25°17'44''E	**Linden forest** with tufts of butcher's-broom	23.III–8.VII *[1]*, 8.VII–10.XI.2019 *[2]*, 10.XI.2019–12.IV.2020 *[3]* [6 traps, formaldehyde]
XVI	S Saedinenie vill. 449 m	42°20'44''N 25°17'41''E	**Mixed forest** of oak, linden, and maple, with *Ruscus*, *Viburnum* sp. and ivy	23.III–8.VII *[1]*, 8.VII–10.XI.2019 *[2]*, 10.XI.2019–12.IV.2020 *[3]* [6 traps, formaldehyde]
XVII	N Sredno Gradishte vill. 418 m	42°19'21''N 25°17'39''E	**Dry forest** on shallow stony soil with oaks, Oriental hornbeam, Jerusalem thorn, cornel, hawthorn and *Ruscus*	23.III–8.VII *[1]*, 8.VII–10.XI.2019 *[2]*, 10.XI.2019–12.IV.2020 *[3]* [6 traps, formaldehyde]
XVIII	NW Stoyan Zaimovo vill. 435 m	42°21'13''N 25°20'46''E	**Abandoned pasture** with single bushes and trees – pear, apple, cherry plum, oaks, blackthorn and blackberry	23.III–8.VII *[1]*, 8.VII–10.XI.2019 *[2]*, 10.XI.2019–12.IV.2020 *[3]* [6 traps, formaldehyde]
XIX	NW Stoyan Zaimovo vill. 406 m	42°21'02''N 25°20'40''E	On the edge of **alfalfa field**, bordering with belt of bushes and trees	23.III–8.VII *[1]*, 8.VII–10.XI.2019 *[2]*, 10.XI.2019–12.IV.2020 *[3]* [6 traps, formaldehyde]
XX	S Stoyan Zaimovo vill. 363 m	42°20'16''N 25°21'28''E	**Ecotone** between wheat field and small river, overgrown with walnuts and blackberry	23.III–8.VII *[1]*, 8.VII–10.XI.2019 *[2]*, 10.XI.2019–12.IV.2020 *[3]* [6 traps, formaldehyde]
Bratan Region				
XXI	E Zelenikovo vill.	42°24'46''N 25°05'13''E	**Scots pine plantation** with lush undergrowth of hawthorn, rosehip,	24.III–9.VII *[1]*, 9.VII–9.XI.2019 *[2]*, 9.XI.2019–12.IV.2020 *[3]* [6 traps,

	344 m		blackberry and butcher's-broom, near walnut and linden plantations	formaldehyde]
XXII	S Turiya vill. 583 m	42°31'35''N 25°11'59''E	**Riverine forest** at the lower limits of the beech, with alder, hazel and hornbeam	24.III–9.VII *[1]*, 9.VII–9.XI.2019 *[2]*, 9.XI.2019–12.IV.2020 *[3]* [6 traps, formaldehyde]
2018, leg. Denis Gradinarov (DGr) & Yana Petrova (YP)				
Do	2,5 km SE Domlyan vill. 445 m	42°30'47"N 24°55'17"E	**Meadows** and shrubs near to an oak forest	23.IV–23.V *[1]*, 23.V–23.VI *[2]*, 23.VI–21.VII.2018 *[3]* [3 small traps, propylene glycol]
Mr	3 km NE Mrachenik vill. 810 m	42°30'08"N 24°59'53"E	**Edge** of an oak forest	23.IV–24.V *[1]*, 24.V–23.VI *[2]*, 23.VI–21.VII *[3]*, 21.VII–24.VIII *[4]*, 24.VIII–23.IX *[5]*, 23.IX–20.X.2018 *[6]* [6 small traps, propylene glycol]
Sv	NW Svezhen vill. 750 m	42°30'37"N 25°00'41"E	**Edge** of a beech forest with oak	23.IV–25.V *[1]*, 25.V–23.VI *[2]*, 23.VI–21.VII.2018 *[3]* [7 small traps, propylene glycol; light]
Ch	5 km SW Chehlare vill. 430 m	42°24'42"N 25°06'10"E	**Oak-hornbeam forest**	22.IV–24.V *[1]*, 24.V–23.VI *[2]*, 23.VI–21.VII *[3]*, 21.VII–25.VIII *[4]*, 25.VIII–23.IX *[5]*, 23.IX–21.X.2018 *[6]* [3 small, propylene glycol]
Ka	NW Gorno Novo Selo vill. 800 m	42°28'22"N 25°13'04"E	**Oak forest** between Kavakliyka Hut and Kaleto Place	22.VII–26.VIII *[1]*, 26.VIII–24.IX *[2]*, 24.IX–21.X.2018 *[3]* [8 small traps, propylene glycol]
2018, leg. Teodora Teofilova (TT)				
R02	W Zelenikovo vill. 280 m	42°23'47''N 25°02'57''E	Oilseed rape **field**	19.IV–15.V *[1]*, 15.V–11.VI *[2]*, 26.VII–25.VIII.2018 *[3]* [5 small traps, salt-vinegar solution]
G02	W Zelenikovo vill. 290 m	42°23'49''N 25°03'09''E	Actively grazed **pasture** in agrolandscape	19.IV–15.V *[1]*, 15.V–11.VI *[2]*, 26.VII–25.VIII.2018 *[3]* [5 small traps, salt-vinegar solution]
R03	S Zelenikovo vill. 288 m	42°22'45''N 25°04'48''E	Oilseed rape **field**	19.IV–15.V *[1]*, 15.V–11.VI *[2]*, 26.VII–25.VIII.2018 *[3]* [5 small traps, salt-vinegar solution]
G03	S Zelenikovo vill. 290 m	42°22'50''N 25°04'43''E	Actively grazed **pasture** in agrolandscape	19.IV–15.V *[1]*, 15.V–11.VI *[2]*, 26.VII–25.VIII.2018 *[3]* [5 small traps, salt-vinegar solution]
2018, leg. Dilian Georgiev (DG)				
Hr	Hrishteni vill. 230 m	42°27'13''N 25°42'19''E	House **yard**	Hand picking, small traps with soapy water, and light attraction

Captured animals are deposited in the first author's collection in the Institute of Biodiversity and Ecosystem Research (Bulgarian Academy of Sciences, Sofia).

According to their zoogeographical belonging, the ground beetle species are classified in zoogeographical categories and complexes according to Kryzhanovskij (1965, 1983, 2002), Vigna Taglianti *et al.* (1999) and Kodzhabashev & Penev (2006), with modifications, done by the authors of the present study. The used Zoogeographical complexes are: Northern Holarctic and European-Siberian complex, including species distributed mainly in the northern regions of the Holarctic, mostly in Europe and Siberia; European complex, including mostly forest dwelling species connected to the middle and southern parts of Europe; European-Asiatic complex, including species which ranges lie between the Eurosiberian and Mediterranean zones; Mediterranean (*sensu lato*) complex, including species distributed in the region of the so-called 'Ancient Mediterraneum' (Popov 1927; Kryzhanovskij 1965, 1983, 2002); Endemic complex, including species with limited ranges.

Results and Discussion

The results from the study revealed that in Sarnena Sredna Gora Mts 175 species of ground beetles occur. They belong to 59 genera and 21 tribes. This represents, respectively, 23% of all established for Bulgarian carabid fauna species, 47% of the genera and 57% of the tribes (Teofilova & Guéorguiev *in prep.*).

Species list:

1. ***Cylindera (Cylindera) germanica germanica*** (Linnaeus, 1758)
   New material: SW Srednogorovo vill., 42°30'22''N, 25°15'32''E, 913 m, 1ex., 31.V.2019, obs. NK.
2. ***Cicindela (Cicindela) sylvicola*** Dejean, 1822
   "Sredna Gora/Karadzhadag" near Turiya vill. (Yoakimov 1904). New material: SW Srednogorovo vill., 42°30'22''N, 25°15'32''E, 913 m, 1♀, 31.V.2019, TT.
3. ***Cicindela (Cicindela) campestris campestris*** Linnaeus, 1758
   New material: ***IV***: 1ex., 09.V.2019, TT; NE Rozovets vill., 42°29'19"N, 25°08'57"E, 825 m, beech forest, 1♀, 20.VI.2020, TT; SW Srednogorovo vill., 42°30'22''N, 25°15'32''E, 913 m, 1♂, 31.V.2019, TT&NK.
4. ***Leistus (Pogonophorus) rufomarginatus*** (Duftschmid, 1812)
   New material: ***II***: 4♀6♂ *[3]*; ***V***: 1♂ *[3]*; ***VIII***: 1♂ *[3]*; ***X***: 2♀3♂ *[3]*; ***XI***: 1♀ *[1]*, 1♂ *[3]*; S Shanovo vill., near river, 42°31'58.4''N, 25°38'36.0''E, 432 m, 1♂, 26.V.2018, DG.
5. ***Nebria (Nebria) brevicollis brevicollis*** (Fabricius, 1792)
   New material: ***X***: 2♀3♂ *[1]*, 1♂ *[2]*; ***Ch***: 1♀3♂ *[1]*, 1♀ *[2]*, 2♀1♂ *[6]*; ***R03***: 1♀ *[1]*, 3♀3♂ *[2]*; ***G02***: 2♀ *[1]*.
6. ***Notiophilus aestuans*** Dejean, 1826
   New material: ***R03***: 1♀ *[1]*.
7. ***Notiophilus biguttatus*** (Fabricius, 1779)
   New material: ***VII***: 1♀1♂ *[1]*, 2♂ *[2]*, 3♀2♂ *[3]*; ***XI***: 1♂ *[2]*.
8. ***Notiophilus rufipes*** Curtis, 1829
   New material: ***II***: 1♀ *[3]*; ***III***: 1♂ *[2]*; ***V***: 1♀2♂ *[1]*, 1♀1♂ *[3]*; ***VII***: 1♀ *[1]*; ***VIII***: 1♂ *[2]*; ***IX***: 2♂ *[1]*, 1♀ *[2]*, 1♀2♂ *[3]*; ***X***: 5♀6♂ *[1]*, 1♀1♂ *[2]*, 2♀6♂ *[3]*; ***XI***: 4♀8♂ *[1]*, 5♀5♂ *[3]*; ***XX***: 1♀1♂ *[3]*; ***XXI***: 1♀ *[3]*; ***Do***: 2♂ *[1]*, 1♀ *[2]*; ***Mr***: 1♀ *[1]*; ***Sv***: 2♀5♂ *[1]*; ***Ch***: 2♂ *[1]*.
9. ***Calosoma (Calosoma) inquisitor inquisitor*** (Linnaeus, 1758)
   New material: ***II***: 1ex. *[1]*; ***IV***: 1♀2♂ *[1]*; ***V***: 9♀8♂ *[1]*; ***VII***: 1♀1♂ *[1]*; ***IX***: 1♀ *[1]*; ***XI***: 4♀8♂ *[1]*, 1♀ *[3]*, many beetles on the trees, feeding on caterpillars, 09.V.2020, obs. TT&NK; ***XII***: 1♀ *[1]*, 1ex., 23.III.2019, obs. TT&NK; ***XVI***: 1♀ *[1]*; ***XVII***: 6♀8♂ *[1]*; ***XVIII***: 1♀ *[1]*; ***XXI***: 1♂ *[1]*; ***XXII***: 3♀32♂ *[1]*; ***Do***: 1♀1♂ *[1]*; ***Mr***: 13♀168♂ *[1]*, 1♀1♂ *[2]*; ***Sv***: 8♀42♂ *[1]*; ***Ch***: 1♂ *[1]*; NE Kavakliyka Hut, 42°29'12''N, 25°13'50''E, 1055 m, 3 ex, 31.V.2019, obs. TT; near the Moruley Peak, oak-hornbeam forest with small glades,42°31'27.7''N, 25°45'31.8''E, 586 m, 1♀, 7.VI.2018, DG.
10. ***Calosoma (Campalita) auropunctatum auropunctatum*** (Herbst, 1784)
    New material: ***R03***: 1♀1♂ *[1]*, 2♀ *[2]*.
11. ***Carabus (Eucarabus) ulrichii rhilensis*** Kraatz, 1876
    New material: N Kolena vill., near the small river of Kolenska, *Carpinus orientalis*, *Alnus glutinosa*, 42°29'25.5''N, 25°43'10.1''E, 285 m, pitfall trap, 1♀, 11.IV.2018, DG.
12. ***Carabus (Tachypus) cancellatus*** Illiger, 1798
    [as *subgraniger*] "Sredna Gora/Karadzhadag" near Turiya vill. (Yoakimov 1904); Kayaldzh-dere near Turiya vill. (Buresch & Kantardzhieva 1928).
13. ***Carabus (Carabus) granulatus granulatus*** Linnaeus, 1758
    New material: ***R03***: 1♂ *[2]*, 1♂ *[3]*.
14. ***Carabus (Archicarabus) montivagus montivagus*** Palliardi, 1825
    New material: ***I***: 1♀2♂ *[3]*; ***II***: 1♀ *[1]*, 1♀ *[3]*; ***V***: 3♀1♂ *[1]*, 3ex. *[2]*; ***VII***: 2♀4♂ *[1]*, 1♂ *[2]*, 1♀1♂ *[3]*; ***VIII***: 1ex. *[2]*; ***IX***: 1♀1♂ *[2]*; ***X***: 4♀7♂ *[1]*, 1♂ *[2]*; ***XI***: 9♀2♂ *[1]*, 5♀14♂1ex. *[2]*, 6♀5♂ *[3]*; ***XII***: 4♀2♂2ex. *[1]*, 4♀3♂ *[2]*, 12♀9♂ *[3]*; ***XIII***: 1♀1♂ *[1]*, 1♀2♂ *[3]*; ***XV***: 2♀ *[1]*, 1♀ *[2]*; ***XVII***: 1♀ *[1]*; ***XIX***: 1♀ *[1]*, 3♀1♂ *[3]*; ***XXI***: 50♀56♂ *[1]*, 15♀24♂3ex. *[2]*, 16♀29♂ *[3]*; ***XXII***: 26♀13♂ *[1]*, 5♀3♂ *[2]*, 1♂ *[3]*; ***Mr***: 1♀ *[1]*, 2♂ *[3]*, 2♀ *[4]*; ***Sv***: 1♀2♂ *[1]*, 1♂ *[2]*; ***Ch***: 1♀1♂ *[1]*, 1♀ *[2]*, 4♀4♂ *[3]*, 3♀2♂ *[6]*; ***Ka***: 3♀4♂1ex. *[1]*, 2♀3♂ *[2]*, 3♀9♂ *[3]*; ***R03***: 1♀ *[2]*, 1♀ *[3]*; ***G02***: 1♂ *[1]*.

15. ***Carabus (Tomocarabus) convexus dilatatus*** Dejean, 1826

"Sredna Gora/Karadzhadag" near Turiya vill. (Buresch & Kantardzhieva 1928). New material: ***I***: 1♀2♂ *[1]*, 6♂ *[3]*; ***II***: 1♂ *[2]*, 2♀2♂ *[3]*; ***V***: 2♀ *[1]*, 4♀3♂6ex. *[2]*; ***VI***: 1♀3♂ *[2]*; ***VII***: 3♀ *[1]*, 1♂ *[2]*, 2♂ *[3]*; ***VIII***: 2♂ *[1]*, 1♀2♂ *[2]*, 2♀4♂ *[3]*; ***IX***: 1♀ *[1]*, 10♀7♂ *[2]*, 2♀3♂ *[3]*; ***X***: 3♀2♂ *[1]*, 2♀ *[2]*; ***XI***: 6♀4♂ *[1]*, 20♀14♂1ex. *[2]*, 32♀54♂ *[3]*; ***XII***: 1♀1♂ *[1]*, 1♀ *[2]*, 12♀24♂ *[3]*; ***XIII***: 1♀ *[1]*, 1♀1♂ *[3]*; ***XV***: 1♀ *[2]*, 1♀1♂ *[3]*; ***XVI***: 2♀ *[1]*, 1♀1♂ *[2]*, 1♀1♂ *[3]*; ***XVII***: 18♀5♂ *[1]*, 1♀ *[2]*, 1♀7♂ *[3]*; ***XVIII***: 1♂ *[1]*; ***XIX***: 1♀4♂ *[3]*; ***XXI***: 6♀12♂ *[1]*, 2♀2♂ *[2]*, 4♀4♂ *[3]*; ***XXII***: 1♀1♂ *[1]*, 3♂ *[2]*; ***Do***: 1♂ *[1]*, 4♀6♂, *[2]*, 3♀ *[3]*; ***Mr***: 1♂ *[1]*, 10♀3♂ *[2]*, 2♀1♂ *[3]*, 2♀1♂ *[4]*, 1♀ *[5]*; ***Sv***: 1♀3♂ *[1]*, 2♀ *[2]*, 1♀1♂ *[3]*; ***Ch***: 2♀16♂ *[1]*, 17♀16♂ *[2]*, 11♀6♂ *[3]*, 2♀3♂ *[4]*, 1♀ *[5]*, 1♂ *[6]*; ***Ka***: 4♀6♂ *[1]*, 7♀5♂ *[2]*, 3♀2♂ *[3]*; ***R02***: 1♂ *[1]*; N Kolena vill., near the small river of Kolenska, *Carpinus orientalis*, *Alnus glutinosa*, 42°29'25.5''N, 25°43'10.1''E, 285 m, pitfall trap, 1♀1♂, 11.IV.2018, DG.

16. ***Carabus (Pachystus) hortensis hortensis*** Linnaeus, 1758

"Sredna Gora/Karadzhadag" near Turiya vill. (Yoakimov 1904, Buresch & Kantardzhieva 1928). New material: ***II***: 1♂ *[2]*; ***III***: 2♀ *[1]*, 1♀1♂ *[2]*; ***IV***: 8♀3♂2ex. *[2]*; ***VI***: 1♀ *[1]*, 11♀7♂4ex. *[2]*; ***VII***: 4♀1♂ *[1]*, 10♀4♂7ex. *[2]*; ***VIII***: 2♀2♂ *[2]*; ***IX***: 1♀2♂ *[2]*; ***XXII***: 56♀12♂ *[1]*, 24♀27♂ *[2]*, 1♀ *[3]*; ***Ka***: 1♂ *[2]*.

17. ***Carabus (Chaetocarabus) intricatus intricatus*** Linnaeus, 1760

"Sarnena Gora" (Buresch & Kantardzhieva 1928). New material: ***III***: 2ex., 11.XI.2019, obs. TT&NK; ***IV***: 2♀ *[1]*, 2♀2♂2ex. *[2]*; ***VI***: 2♂ *[1]*, 6♀4♂ *[2]*; ***VII***: 2♀1♂ *[1]*, 2♀ *[2]*; ***VIII***: 1♀1♂ *[2]*; ***IX***: 2♀3♂ *[2]*; ***XIV***: 1♂ *[1]*, 3ex. *[2]*, 1♀ *[3]*, 1ex., 23.III.2019, obs. TT&NK; ***XV***: 20♀13♂ *[1]*, 13♀8♂ *[2]*, 1♀1♂ *[3]*; ***XVI***: 28♀25♂ *[1]*, 5♀3♂ *[2]*, 1♀ *[3]*; ***XXII***: 4♀4♂1ex. *[1]*; ***Sv***: 2♂ *[1]*; ***Ka***: 3♀4♂ *[2]*, 2♀1♂ *[3]*; NE Kavakliyka Hut, 42°29'12''N, 25°13'50''E, 1055 m, 1ex., 31.V.2019, obs. TT; W Kolena vill., 42°28'58.1''N, 25°42'20.4''E, 359 m, *Pinus nigra* forest, 1♂, 18.III.2018, DG; near Zmeevo vill., 42°30'53.11''N, 25°37'47.88''E, 765 m, mixed deciduous forest, 1♂, 28.V.2018, DG.

18. ***Carabus (Megodontus) violaceus azuresens*** Dejean, 1826

"Sredna Gora/Karadzhadag" (Yoakimov 1904, Nedelkov 1909, Buresch & Kantardzhieva 1928). New material: ***III***: 1♂ *[2]*; ***IV***: 4♀ *[2]*; ***VI***: 12♀4♂ *[2]*; ***VIII***: 1♀ *[1]*; ***XXII***: 1♀2♂ *[1]*, 6♀1♂ *[2]*.

19. ***Carabus (Procrustes) coriaceus cerisyi*** Dejean, 1826

"Sredna Gora/Karadzhadag" near Turiya vill. (Yoakimov 1904). New material: ***I***: 2♀ *[1]*, 1♀1♂ *[2]*; ***VII***: 1♂ *[2]*; ***VIII***: 2♀ *[1]*, 3♀ *[2]*; ***XI***: 2♀1♂ *[1]*, 1♂ *[2]*; ***XII***: 1♂ *[1]*, 5♀5♂ *[2]*, 1♀ *[3]*; ***XIII***: 1♀1♂ *[1]*, 1♀1♂ *[2]*, 1♀ *[3]*; ***XIV***: 1♂ *[1]*; ***XV***: 3♀1♂ *[1]*, 1♀ *[2]*; ***XVI***: 1♀ *[1]*, 1♂ *[2]*; ***XVII***: 2♀1♂ *[1]*, 3♀ *[2]*, 1♀ *[3]*; ***XVIII***: 1♀1♂ *[1]*, 4♀8♂ *[2]*; ***XIX***: 1♀ *[1]*, 2♀10♂ *[2]*, 2♀ *[3]*; ***XX***: 1♀ *[1]*; ***XXI***: 7♀1♂ *[1]*, 7♀4♂ *[2]*, 2♀2♂ *[3]*; ***R02***: 1♀2♂ *[2]*, 1♀ *[3]*; ***G02***: 1♂ *[3]*; ***G03***: 1♀1♂ *[2]*; ***Do***: 1♂ *[1]*; ***Mr***: 1♀ *[2]*, 1♀ *[5]*; ***Sv***: 1♀ *[2]*; ***Ch***: 3♀ *[2]*, 2♀1♂ *[6]*; ***Hr***: 1♀, 9.VII.2018.

20. ***Carabus (Procerus) scabrosus scabrosus*** Olivier, 1790

"Sredna Gora above Stara Zagora" (Nedelkov 1909); "Sredna Gora/Karadzhadag" near Turiya vill. (Yoakimov 1904, Buresch & Kantardzhieva 1928). New material: ***XII***: 1♀1♂ *[2]*; ***XIV***: 2♂ *[2]*; ***XV***: 2♀1♂ *[2]*; ***XVI***: 1♂ *[1]*, 2♀ *[2]*; ***XX***: 1♀1♂ *[1]*, 2♀1larva *[2]*, 1ex., 08.VII.2019, obs. TT&NK; ***XXI***: 1ex. *[1]*, 1larva *[2]*; Moruley Hut, 42°31'20'' N 25°44'54'' E, 595 m, oak forest, 1♂, 19.VI.2020, NK&TT; Svezhen vill., 42°30'17''N, 25°01'32''E, 750 m, 1♂, 23.VI.2018, DGr&YP.

21. ***Cychrus semigranosus balcanicus*** Hopffgarten, 1881

"Sredna Gora/Karadzhadag" near Turiya vill. (Yoakimov 1904, Buresch & Kantardzhieva 1928). New material: ***II***: 1ex. *[1]*; ***III***: 1♂ *[1]*, 3♀3♂ *[2]*; ***IV***: 1♀ *[1]*, 2♀1♂1ex. *[2]*; ***VI***: 2♀1ex. *[2]*; ***VII***: 3♀ *[1]*, 1♂3ex. *[2]*; ***XXI***: 1♂ *[3]*; ***XXII***: 1♀ *[1]*, 3♀2♂ *[2]*; ***Ka***: 1♂ *[2]*, 2♀4♂ *[3]*; near Moruley Peak, 42°31'28''N, 25°45'32''E, 586 m, oak-hornbeam forest with small glades, 1ex., 7.VI.2018, DG.

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

New material: ***XXII***: 2♀ *[1]*.

23. ***Apotomus clypeonitens adanensis*** Jedlička, 1961

New material: ***R03***: 1♂ *[2]*.

24. ***Perileptus (Perileptus) areolatus*** (Creutzer, 1799)
    "Sredna Gora/Karadzhadag" near Turiya vill. (Yoakimov 1904).
25. ***Trechus (Trechus) quadristriatus*** (Schrank, 1781)
    New material: ***I***: 1♀1♂ *[1]*; ***III***: 1♀1♂ *[2]*; ***VI***: 1♀1♂ *[2]*; ***VII***: 3♀3♂ *[1]*; ***VIII***: 1♂ *[2]*; ***X***: 1♂ *[1]*; ***XI***: 1♂ *[1]*; ***XIV***: 1♀3♂ *[1]*; ***XVII***: 1♀ *[1]*; ***XVIII***: 1♂ *[2]*; ***XIX***: 4♀3♂ *[2]*, 34♀52♂ *[3]*; ***XX***: 1♀1♂ *[2]*; ***XXI***: 3♀7♂ *[1]*; ***XXII***: 1♂ *[2]*; ***Do***: 1♂ *[1]*; ***Mr***: 2♀ *[1]*, 3♀3♂ *[2]*, 1♀ *[6]*; ***Sv***: 1♂ *[1]*; ***Ch***: 4♀9♂ *[2]*, 1♀2♂ *[5]*, 1♀ *[6]*; ***Ka***: 1♂ *[1]*, 1♀ *[2]*, 1♂ *[3]*; ***R02***: 1♂ *[1]*; ***R03***: 1♀1♂ *[2]*; ***G02***: 1♂ *[1]*; ***G03***: 1♀ *[2]*; ***Hr***, at light: 1♀, 7.IX.2018, 1♀1♂, 13.IV.2018; NW Moruley Hut, 42°31'55"N 25°43'53"E, 785 m, beech forest, 2♀, under stone, 19.VI.2020, TT; NE Kavakliyka Hut, 42°29'12"N, 25°13'50"E, 1055 m, 3♀4♂, 31.V.2019, TT; S Shanovo vill., 42°31'58"N, 25°38'36"E, 432 m, near river, 1♀, 26.V.2018, DG; W Stara Zagora, 42°24'33"N, 25°33'26"E, 390 m, meadows, 1♀, 4.VI.2018, DG.
26. ***Trechus (Trechus) crucifer*** Piochard de la Brûlerie, 1876
    New material: ***II***: 1♀2♂ *[3]*; ***VII***: 1♀ *[3]*.
27. ***Trechus (Trechus) irenis*** Csiki, 1912
    New material: ***XXII***: 1♂ *[1]*.
28. ***Tachys (Paratachys) bistriatus bistriatus*** (Duftschmid, 1812)
    New material: ***R03***: 1♀ *[2]*.
29. ***Tachyura (Sphaerotachys) hoemorroidalis*** (Ponza, 1805)
    New material: ***Hr***, under lamp: 1♀, 13.IV.2018, DG.
30. ***Tachyta (Tachyta) nana*** (Gyllenhall, 1810)
    "Sredna Gora/Karadzhadag" near Turiya vill. (Yoakimov 1904).
31. ***Asaphidion flavipes*** (Linnaeus, 1760)
    New material: ***XX***: 1♀ *[1]*.
32. ***Asaphidion flavicorne*** (Solsky, 1874)
    New material: ***X***: 1♀ *[1]*.
33. ***Bembidion (Metallina) lampros*** (Herbst, 1784)
    New material: ***X***: 1♂ *[1]*, 1♀ *[2]*; ***XX***: 2♂ *[2]*, 1♀ *[3]*; SW Srednogorovo vill., 42°30'04"N, 25°16'21"E, 860 m, oak-hornbeam forest, 2♂, 31.V.2019, TT.
34. ***Bembidion (Metallina) properans*** (Stephens, 1828)
    New material: ***XX***: 1ex. *[2]*; ***R02***: 1♂ *[1]*; ***R03***: 1♂ *[2]*.
35. ***Bembidion (Talanes) subfasciatum*** Chaudoir, 1850
    "Sredna Gora/Karadzhadag" near Turiya vill. (Yoakimov 1904).
36. ***Bembidion (Peryphus) femoratum*** Sturm, 1825
    "Sredna Gora/Karadzhadag" near Turiya vill. (Yoakimov 1904).
37. ***Bembidion (Peryphanes) deletum deletum*** Audinet-Serville, 1821
    "Sredna Gora/Karadzhadag" near Turiya vill. (Yoakimov 1904). New material: N Moruley Hut, 42°31'32" N 25°44'53" E, 560 m, oak forest, 1♀, 19.VI.2020, TT.
38. ***Bembidion (Peryphanes) dalmatinum dalmatinum*** Dejean, 1831
    New material: ***XIV***: 1♂ *[3]*; NW Zlati Voivoda vill., 42°37'00"N, 26°10'10"E, 174 m, near Tundzha River, 1♀1♂, 30.V.2019, TT; S Shanovo vill., 42°31'47.7"N, 25°38'39.8"E, 450 m, oak-hornbeam forest, near brook, 1♀1♂, 26.V.2018, DG.
39. ***Bembidion (Peryphanes) castaneipenne*** Jacquelin du Val, 1852
    New material: ***XX***, at the river bank: 2♀3♂, 08.VII.2019, TT.
40. ***Bembidion (Peryphanes)* sp.**
    New material: N Moruley Hut, 42°31'32"N 25°44'53"E, 560 m, oak forest, 1♂, 19.VI.2020, TT.
41. ***Xenion ignitum*** (Kraatz, 1875)
    New material: ***II***: 1♀ *[2]*; ***III***: 1♂ *[1]*, 4♀3♂ *[2]*; ***IV***: 17♀14♂ *[1]*, 25♀15♂1ex. *[2]*; ***V***: 2♀1♂ *[1]*, 1ex. *[2]*; ***VI***: 5♀3♂ *[1]*, 10♀3♂ *[2]*; ***VII***: 5♀8♂1ex. *[1]*, 5♀8♂4ex. *[2]*; ***IX***: 3♀3♂ *[1]*; ***XXII***: 9♀12♂ *[1]*, 2♀3♂ *[2]*; ***Sv***: 1♀ *[2]*; ***Ka***: 3♀3♂ *[1]*, 1♀ *[2]*.

42. ***Myas (Myas) chalybaeus*** (Palliardi, 1825)

"Sredna Gora/Karadzhadag" near Turiya vill. (Yoakimov 1904). New material: ***II***: 2♂3ex. *[1]*, 1♀2♂ *[2]*; ***III***: 9♀5♂1ex. *[2]*; ***IV***: 5♀1♂ *[1]*, 5♀8♂2ex. *[2]*, 1♂ *[3]*; ***V***: 2♀1♂ *[1]*, 2♀4♂2ex. *[2]*, 1♀ *[3]*; ***VI***: 11♀3♂ *[1]*, 15♀11♂ *[2]*, 2♂ *[3]*; ***VII***: 15♀8♂ *[1]*, 10♀17♂18ex. *[2]*; ***VIII***: 8♀6♂ *[2]*, 1♀ *[3]*; ***IX***: 1♂ *[1]*, 3♀4♂ *[2]*; ***X***: 3♂ *[2]*; ***XI***: 5♀1♂ *[1]*, 3♀6♂ *[2]*; ***XV***: 1♀1ex. *[1]*, 2♀ *[2]*; ***XVI***: 1♀1♂ *[1]*, 1♀ *[2]*, 1♂ *[3]*; ***XVII***: 1♂ *[2]*; ***XVIII***: 1♀2♂ *[2]*; ***XIX***: 1♂ *[2]*; ***XX***: 2♀5♂ *[2]*; ***XXI***: 1♀ *[1]*, 10♀6♂ *[2]*; ***XXII***: 1♂ *[1]*; ***Mr***, 2♂ *[1]*, 1♀1♂ *[2]*, 2♀2♂ *[4]*, 4♂ *[5]*, 2♀6♂ *[6]*; ***Ch***: 2♀2♂ *[1]*, 1♀1♂ *[2]*, 3♀1♂ *[6]*; ***Ka***: 2♀2♂ *[1]*, 5♀8♂ *[2]*, 38♀32♂ *[3]*; ***G03***: 1♂ *[2]*.

43. ***Poecilus (Poecilus) cupreus cupreus*** (Linnaeus, 1758)

New material: ***XX***: 1♀1♂ *[1]*, 1♀ *[2]*; ***R02***: 5♀7♂ *[1]*, 2♀3♂ *[2]*, 1♂ *[3]*; ***R03***: 17♀34♂1ex. *[1]*, 39♀21♂ *[2]*, 17♀18♂ *[3]*; NW Zlati Voivoda vill., 42°37'00''N, 26°10'10''E, 174 m, near Tundzha River, 1♀, 30.V.2019, TT.

44. ***Poecilus (Poecilus) cursorius cursorius*** (Dejean, 1828)

New material: ***R03***: 1♂ *[2]*.

45. ***Poecilus (Poecilus) versicolor*** (Sturm, 1824)

New material: ***I***: 1♀1♂ *[1]*.

46. ***Pedius inquinatus*** (Sturm, 1824)

New material: ***R03***: 1♂ *[1]*.

47. ***Pterostichus (Parahaptoderus) vecors*** Tschitschérine, 1897

New material: ***XXII***: 1♀1♂ *[1]*.

48. ***Pterostichus (Platysma) niger niger*** (Schaller, 1783)

New material: ***III***: 6♀2♂ *[2]*; ***IV***: 2♀1♂3ex. *[2]*; ***VII***: 1♂4ex. *[2]*; ***VIII***: 1♀ *[2]*; ***X***: 1♀ *[1]*, 1♀1♂ *[2]*; ***XIV***: 1ex. *[2]*; ***XXII***: 1♂ *[1]*, 14♀21♂ *[2]*.

49. ***Pterostichus (Argutor) vernalis*** (Panzer, 1796)

New material: ***X***: 1♂ *[1]*.

50. ***Pterostichus (Pseudomaseus) anthracinus anthracinus*** (Illiger, 1798)

"Sredna Gora/Karadzhadag" near Turiya vill. (Yoakimov 1904). New material: ***R03***: 1♀ *[3]*.

51. ***Pterostichus (Pseudomaseus) nigrita nigrita*** (Paykull, 1790)

New material: ***XXII***: 1♀1♂ *[1]*.

52. ***Pterostichus (Phonias) strenuus*** (Panzer, 1796)

New material: ***X***: 2♀ *[1]*.

53. ***Pterostichus (Bothriopterus) oblongopunctatus oblongopunctatus*** (Fabricius, 1787)

"Sredna Gora/Karadzhadag" near Turiya vill. (Yoakimov 1904). New material: ***I***: 1♀ *[3]*; ***II***: 1♀1ex. *[1]*, 1ex. *[2]*; ***III***: 1♀5♂ *[1]*, 2♀ *[2]*; ***IV***: 2♂ *[1]*, 1ex. *[2]*; ***V***: 4♀2♂1ex. *[1]*; ***VI***: 2♀2♂ *[1]*, 2♀ *[2]*, 1♀ *[3]*; ***VII***: 18♀14♂ *[1]*, 4♀3♂3ex. *[2]*, 3♀4♂ *[3]*, 2ex., 11.XI.2019, obs. TT; ***IX***: 1ex. *[1]*, 12♀6♂ *[2]*; ***X***: 34♀55♂ *[1]*, 8♀8♂ *[2]*, 3♂ *[3]*; ***XI***: 1♀1♂ *[1]*, 1♀1♂ *[2]*; ***XXI***: 1♀ *[1]*; ***XXII***: 56♀61♂ *[1]*, 24♀20♂ *[2]*.

54. ***Pterostichus (Bothriopterus) quadrifoveolatus*** Letzner, 1852

New material: ***XVI***: 1♀ *[1]*.

55. ***Pterostichus (Petrophilus) melanarius*** (Illiger, 1798)

[as *vulgaris*] "Sredna Gora/Karadzhadag" near Turiya vill. (Yoakimov 1904).

56. ***Pterostichus (Feronidius) melas depressus*** (Dejean, 1828)

"Sredna Gora/Karadzhadag" near Turiya vill. (Yoakimov 1904). New material: ***VIII***: 3♀1♂1ex. *[2]*; ***XIV***: 1ex. *[2]*; ***XV***: 3♀1♂ *[1]*, 2♀4♂ *[2]*, 1♀ *[3]*; ***XVI***: 2♀2♂ *[1]*, 6♀8♂ *[2]*; ***XVII***: 1♀ *[1]*, 3♀6♂ *[2]*; ***Ch***: 1♂ *[4]*, 1♂ *[5]*; ***Ka***: 11♀11♂ *[1]*, 41♀34♂ *[2]*, 13♀2♂ *[3]*; near Stara Zagora, 42°28'44.9''N, 25°39'55.1''E, 471 m, *Tilia-Quercus* spp. forest, found dead under trunk, 1ex., 3.I.2019, DG.

57. ***Pterostichus (Feronidius) incommodus*** Schaum, 1858

New material: ***XVII***: 1♀ *[2]*.

58. ***Pterostichus (Pterostichus) merklii*** J. Frivaldszky, 1879

New material: ***XXII***: 2♀5♂ *[1]*.

59. ***Abax (Abax) parallelus parallelus*** (Duftschmid, 1812)

New material: ***XXI***: 1♂ *[3]*; ***XXII***: 30♀22♂ *[1]*, 21♀21♂ *[2]*, 14♀10♂ *[3]*.

60. ***Abax (Abax) ovalis*** (Duftschmid, 1812)

"Sredna Gora/Karadzhadag" near Turiya vill. (Yoakimov 1904). New material: ***III***: 2♀3♂ *[1]*, 22♀18♂ *[2]*, 2♀ *[3]*; ***IV***: 1♀ *[1]*; ***VI***: 1♂ *[1]*, 1ex. *[2]*; ***VII***: 1♀ *[3]*; ***IX***: 1♀ *[1]*; ***XXII***: 10♀5♂ *[1]*, 5♀4♂ *[2]*, 3♀1♂ *[3]*; ***Ka***: 2♀1♂ *[2]*, 2♀ *[3]*.

61. ***Abax (Abax) carinatus carinatus*** (Duftschmid, 1812)

New material: ***I***: 1♀ *[3]*; ***II***: 1♀2♂ *[2]*, 1♂ *[3]*; ***III***: 1♀ *[1]*, 8♀4♂ *[2]*, 1♂ *[3]*; ***V***: 2♀2♂ *[1]*, 4♀1♂5ex. *[2]*; ***VII***: 1♂ *[1]*, 3♀3♂5ex. *[2]*, 1♀ *[3]*; ***VIII***: 1♀ *[1]*, 1♀ *[2]*, 1♂ *[3]*; ***IX***: 1♀ *[1]*, 7♀3♂ *[2]*, 1♀2♂ *[3]*; ***X***: 4♀5♂ *[1]*, 3♀3♂1ex. *[2]*, 1♂ *[3]*; ***XI***: 1♀4♂ *[1]*, 14♀11♂ *[2]*; ***XIV***: 1♀1♂ *[1]*; ***XV***: 1♀1♂ *[1]*, 2♂ *[2]*, 1♀ *[3]*; ***XVI***: 1♀ *[1]*, 1♂ *[2]*, 1♀1♂ *[3]*; ***XVII***: 1♂ *[1]*; ***XXI***: 18♀16♂ *[1]*, 4♀2♂6ex. *[2]*, 4♀1♂ *[3]*; ***XXII***: 4♂ *[1]*, 3♀ *[2]*; ***Mr***: 1♀ *[1]*, 1♂ *[4]*; ***Sv***: 1♂ *[1]*; ***Ch***: 1♀ *[1]*, 1♀1♂ *[5]*, 1♀1♂ *[6]*; ***Ka***: 4♀3♂ *[1]*, 2♀3♂ *[2]*, 5♀ *[3]*.

62. ***Molops (Molops) dilatatus angulicollis*** J. Müller, 1936

New material: ***III***: 1♀3♂ *[1]*, 1♂ *[2]*; ***V***: 1♂ *[1]*; ***X***: 5♂ *[1]*; ***XI***: 6♂ *[1]*, 1♀ *[3]*; ***XXII***: 1♀5♂ *[1]*; ***Mr***: 4♂ *[1]*, 1♀1♂ *[2]*.

63. ***Molops (Molops) alpestris kalofericus*** Mlynář, 1977

Sarnena Gora (Guéorguiev *et al.* 1997). New material: ***III***: 12♀9♂ *[1]*; ***V***: 2♂ *[1]*; ***VI***: 1♂ *[1]*; ***IX***: 1♀ *[1]*; ***XXI***: 1♂ *[1]*; ***XXII***: 6♀6♂ *[1]*; NE Kavakliyka Hut, 42°29'12"N, 25°13'50"E, 1055 m, 1♀, 31.V.2019, TT.

64. ***Molops (Molops) piceus bulgaricus*** Mařan, 1938

New material: ***II***: 1♂ *[2]*, 2♀ *[3]*; ***III***: 17♀17♂ *[1]*, 20♀20♂ *[2]*, 23♀17♂ *[3]*; ***IV***: 9♀34♂ *[1]*, 13♀10♂ *[2]*, 29♀29♂ *[3]*; ***V***: 9♀24♂ *[1]*, 1♂ *[2]*, 2♀1♂ *[3]*; ***VI***: 3♀8♂ *[1]*, 1♀2♂ *[2]*, 5♀1♂ *[3]*; ***VII***: 4♀26♂1ex. *[1]*, 1♂ *[2]*, 3♀7♂ *[3]*; ***VIII***: 1♂ *[1]*, 1♀ *[3]*; ***IX***: 1♀8♂ *[1]*, 3♀3♂ *[2]*, 8♀7♂ *[3]*; ***XIX***: 1♀ *[1]*; ***XXII***: 2♀4♂ *[1]*, 3♀ *[3]*; NE Kavakliyka Hut, 42°29'12"N, 25°13'50"E, 1055 m, 1♂, 31.V.2019, TT.

65. ***Tapinopterus (Tapinopterus) cognatus kalofirensis*** Mařan, 1933

New material: ***III***: 1♀5♂ *[1]*, 6♀3♂ *[2]*, 3♂ *[3]*; ***VI***: 1♀1♂ *[1]*; ***VII***: 3♀2♂ *[1]*, 2♂ *[3]*; ***VIII***: 1♀ *[1]*; ***XXII***: 1♀ *[1]*.

66. ***Calathus (Calathus) distinguendus*** Chaudoir, 1846

New material: ***IV***: 1♀ *[2]*; ***V***: 2♀ *[2]*; ***VIII***: 10♀2♂ *[2]*; ***XI***: 1♀1♂ *[1]*; ***XVII***: 1ex. *[1]*, 2♀ *[2]*, 1♀ *[3]*; ***XVIII***: 1♂ *[1]*, 21♀8♂ *[2]*, 1♀1♂ *[3]*; ***XIX***: 5♂ *[1]*, 105♀69♂1ex. *[2]*; ***XX***: 2♀3♂ *[2]*; ***Mr***: 1♀ *[3]*, 1♀ *[5]*, 1♀ *[6]*; N Zmeevo vill., 42°30'12"N, 25°36'01"E, 445 m, grasses and shrubs, 3♀4♂, 24.IV.2018, DG; S Ostra Mogila vill., 42°27'10"N, 25°28'27"E, 418 m, near river, 1♀, 26.X.2018, DG.

67. ***Calathus (Calathus) fuscipes fuscipes*** (Goeze, 1777)

"Sredna Gora/Karadzhadag" near Turiya vill. (Yoakimov 1904). New material: ***I***: 1♀ *[1]*, 2♀ *[3]*; ***II***: 1♂ *[1]*, 1♀ *[3]*; ***IV***: 1ex. *[2]*; ***V***: 5♀ *[2]*; ***VIII***: 1♀ *[1]*, 33♀27♂ *[2]*; ***IX***: 6♀1♂ *[2]*; ***X***: 1♂ *[1]*, 16♀6♂1ex. *[2]*; ***XI***: 15♀2♂ *[2]*; ***XII***: 2♀ *[2]*; ***XVI***: 1♂ *[1]*; ***XIX***: 3♂ *[1]*, 34♀42♂2ex. *[2]*, 1♀ *[3]*; ***XX***: 15♀18♂ *[2]*; ***Do***: 1♀1♂ *[1]*, 15♀9♂ *[2]*, 1♂ *[3]*; ***Mr***: 7♀ *[2]*, 3♀ *[5]*; ***Sv***: 1♂ *[1]*, 5♀4♂ *[2]*; ***Ch***: 1♂ *[2]*, 1♀ *[4]*, 4♀1♂ *[5]*, 3♀1♂ *[6]*; ***R03***: 2♀ *[2]*; ***G03***: 1♂ *[2]*; ***Hr***: 1♀, 31.X.2018; W Drangovo vill., 42°22'18"N, 25°00'08"E, 260 m, pasture, 1♀1♂, 20.VI.2020, TT; N Zmeevo vill., 42°30'12"N, 25°36'01"E, 445 m, 3♀1♂, 24.IV.2018, DG; Starozagorski Bani, 42°26'59.30"N, 25°29'39.25"E, 383 m, park, 1♀, 10.V.2018, DG.

68. ***Calathus (Calathus) longicollis*** Motschulsky, 1865

New material: ***XII***: 1♀1♂ *[2]*; ***Ka***: 2♀ *[2]*.

69. ***Calathus (Neocalathus) melanocephalus melanocephalus*** (Linnaeus, 1758)

New material: ***I***: 1♂ *[2]*; ***VIII***: 1♀ *[2]*; ***X***: 1♀ *[2]*; ***XX***: 1♂ *[2]*; ***Sv***: 2♀1♂ *[1]*.

70. ***Calathus (Neocalathus) cinctus*** Motschulsky, 1850

New material: ***XIII***: 3♀ *[3]*; ***Hr***: 1♂, under lamp, 6.IX.2018; Hrishteni vill., ruderal plants near agricultural buildings, 42°27'03.8"N, 25°42'09.2"E, 227 m, 1♀, 29.IV.2018, DG.

71. ***Sphodrus leucophthalmus*** (Linnaeus, 1758)

"Sredna Gora/Karadzhadag" near Turiya vill. (Yoakimov 1904).

72. ***Laemostenus (Laemostenus) venustus*** (Dejean, 1828)

New material: ***IV***: 1♂ *[2]*, 1♀ *[3]*; ***VI***: 1♂ *[2]*, 2♀ *[3]*; ***IX***: 1♀1♂ *[2]*; ***XV***: 1♂ *[1]*; ***XVI***: 1♀ *[1]*, 1♂ *[3]*; ***XXI***: 1♂ *[1]*, 1♀1♂ *[3]*.

73. ***Laemostenus (Pristonychus) terricola punctatus*** (Dejean, 1828)
New material: ***V***: 1♀ *[1]*; ***XVI***: 2♀1♂ *[3]*; ***XVII***: 2♀ *[3]*; ***XXII***: 1♀ *[3]*; ***Ch***: 1♀1♂ *[2]*, 1♀ *[5]*.
74. ***Laemostenus (Pristonychus) cimmerius weiratheri*** J. Müller, 1932
New material: ***I***: 3♀1♂2ex. *[2]*, 2♀1♂ *[3]*; ***II***: 2♀2♂ *[2]*, 2♀2♂ *[3]*; ***IV***: 3♀1♂ *[2]*; ***V***: 13♀4♂ *[1]*, 18♀11♂18ex. *[2]*, 2♀ *[3]*; ***VI***: 2♀1♂ *[2]*; ***VII***: 2♀ *[1]*, 4♀5♂9ex. *[2]*; ***VIII***: 1♀ *[1]*, 12♀4♂ *[2]*, 1♂ *[3]*; ***IX***: 2♀ *[1]*, 19♀12♂1ex. *[2]*; ***X***: 1♀ *[1]*, 15♀1♂4ex. *[2]*, 1♂ *[3]*; ***XI***: 1♀ *[1]*, 10♀8♂9ex. *[2]*, 2♀1♂ *[3]*; ***XII***: 1ex. *[1]*, 23♀10♂ *[2]*, 3♀3♂ *[3]*; ***XIII***: 2♀ *[2]*, 13♀2♂ *[3]*; ***XIV***: 3♀ *[1]*, 1♀2ex. *[2]*; ***XV***: 48♀10♂12ex. *[1]*, 28♀28♂ *[2]*, 9♀6♂ *[3]*; ***XVI***: 50♀24♂ *[1]*, 13♀29♂3ex. *[2]*; ***XVII***: 15♀3♂ *[1]*, 5♀2♂ *[2]*, 6♀2♂ *[3]*; ***XVIII***: 1♀1♂ *[2]*; ***XX***: 1♀ *[2]*; ***XXI***: 24♀7♂ *[1]*, 21♀20♂11ex. *[2]*, 5♀2♂ *[3]*; ***XXII***: 1♀1♂ *[1]*, 3♀ *[2]*; ***Mr***: 4♀2♂ *[4]*, 5♀4♂ *[5]*, 1♀1♂ *[6]*; ***Ch***: 2♀ *[3]*, 1♀1♂ *[4]*, 3♀1♂ *[5]*, 6♀1♂ *[6]*; ***Ka***: 2♀1♂ *[1]*, 25♀19♂ *[2]*, 17♀7♂ *[3]*; Mechata Peshtera Cave, Ostra Mogila vill., 42°27'13.7''N, 25°28'16.2''E, 405 m, 2♀, 21.III.2018, 1♀, 28.III.2018, DG.
75. ***Synuchus (Synuchus) vivalis vivalis*** (Illiger, 1798)
"Sredna Gora/Karadzhadag" near Turiya vill. (Yoakimov 1904). New material: ***X***: 1♂ *[1]*, 1♀ *[2]*.
76. ***Platyderus (Platyderus) rufus rufus*** (Duftschmid, 1812)
New material: ***V***: 1♂ *[1]*.
77. ***Limodromus assimilis*** (Paykull, 1790)
New material: ***IX***: 1♂ *[2]*; ***X***: 23♀12♂ *[1]*, 19♀18♂ *[2]*, 1♀1♂ *[3]*; ***XI***: 1♂ *[2]*; ***XVIII***: 1♀ *[1]*; ***XXII***: 56♀35♂ *[1]*, 4♀3♂ *[2]*, 1♀ *[3]*; S Ostra Mogila vill., 42°27'10.1''N, 25°28'27.5''E, 418 m, near river, 1♂, 26.X.2018, DG.
78. ***Anchomenus dorsalis dorsalis*** (Pontoppidan, 1763)
New material: ***XVIII***: 1♀ *[3]*; ***XIX***: 2♀3♂ *[2]*; ***XX***: 1♂ *[2]*; ***XXI***: 6♀4♂ *[1]*; ***R02***: 1♂ *[1]*, 2♂ *[2]*; ***R03***: 2♀3♂ *[1]*, 2♀2♂ *[2]*, 1♂ *[3]*; ***Hr***: 1♀, 14.V.2018.
79. ***Amara (Zezea) chaudoiri incognita*** Fassati, 1946
New material: ***R03***: 1♀2♂ *[3]*.
80. ***Amara (Zezea) fulvipes*** (Audinet-Serville, 1821)
New material: ***R03***: 1♀ *[3]*; ***G02***: 1♂ *[3]*.
81. ***Amara (Amara) aenea*** (De Geer, 1774)
"Karadzhadag" (Hieke & Wrase 1988). New material: ***X***: 1♀ *[3]*; ***XVIII***: 1♀ *[1]*; ***XIX***: 1♀1♂ *[1]*; ***XX***: 1♀ *[1]*; ***R02***: 7♀2♂ *[1]*, 7♀1♂ *[2]*; ***R03***: 8♀3♂ *[1]*, 5♀ *[2]*, 1♀ *[3]*; ***G03***: 2♀3♂ *[1]*, 3♀ *[2]*; Varben vill., 42°25'16''N, 24°58'00''E, 328 m, house yard, 1♀, 20.VI.2020, TT; Hrishteni vill., 42°27'03.8''N, 25°42'09.2''E, 227 m, ruderal plants near agricultural buildings, 1♀, 29.IV.2018, DG; above Turiya vill., 1♀, 24.V.2018, DGr&YP.
82. ***Amara (Amara) anthobia*** A. Villa et G. B. Villa, 1833
"Sredna Gora/Karadzhadag" near Turiya vill. (Yoakimov 1904). New material: ***X***: 4♀2♂ *[1]*; ***XII***: 2♀1♂ *[1]*; ***XVIII***: 2♀ *[1]*; ***G03***: 1♀ *[2]*; ***Hr***: 1♂, 29.IV.2018.
83. ***Amara (Amara) convexior*** Stephens, 1828
New material: ***XX***: 6♀8♂ *[1]*, 1♀ *[2]*, 3♀1♂ *[3]*; ***XXI***: 10♀7♂ *[1]*; ***XXII***: 1♀ *[1]*.
84. ***Amara (Amara) eurynota*** (Panzer, 1796)
New material: ***VIII***: 1♀ *[1]*, 1♀ *[2]*.
85. ***Amara (Amara) communis*** (Panzer, 1797)
New material: ***R03***: 1♀ *[2]*.
86. ***Amara (Amara) familiaris*** (Duftschmid, 1812)
New material: ***R02***: 1♀ *[1]*.
87. ***Amara (Amara) lucida*** (Duftschmid, 1812)
New material: ***XVIII***: 1♀ *[1]*; ***G03***: 1♀ *[1]*, 1♀ *[2]*.
88. ***Amara (Amara) ovata*** (Fabricius, 1792)
New material: ***XI***: 1♀ *[3]*; ***R03***: 1♂ *[1]*, 1♀1♂ *[2]*; ***G03***: 1♀ *[2]*.
89. ***Amara (Amara) saphyrea*** Dejean, 1828

New material: ***X***: 6♀5♂ *[1]*; ***XI***: 3♀1♂ *[1]*, 1♀1♂ *[3]*; ***XII***: 4♀6♂ *[1]*, 2♀1♂ *[3]*; ***XX***: 1♂ *[1]*; ***XXI***: 3♂ *[1]*, 1♂ *[3]*; ***R03***: 1♂ *[1]*; ***G03***: 1♀ *[1]*; Svezhen vill., 42°30'17''N, 25°01'32''E, 750 m, near river, 1♀1♂, 22.IV.2018, DGr.

90. ***Amara (Amara) similata*** (Gyllenhal, 1810)
New material: ***R02***: 1♂ *[2]*; ***R03***: 1♂ *[1]*, 1♀ *[2]*.

91. ***Amara (Amara) montivaga*** Sturm, 1825
New material: N Moruley Hut, 42°31'32''N, 25°44'53''E, 560 m, oak forest, 2♀1♂, 19.VI.2020, TT.

92. ***Amara (Xenocelia) municipalis*** (Duftschmid, 1812)
"Sredna Gora/Karadzhadag" near Turiya vill. (Yoakimov 1904).

93. ***Amara (Bradytus) consularis*** (Duftschmid, 1812)
New material: Varben vill., 42°25'16''N, 24°58'00''E, 328 m, house yard, 1♂, 09.VII.2019, TT; Svezhen vill., 42°30'17''N, 25°01'32''E, 750 m, at light, 1♂, 20.VII.2018, DGr.

94. ***Amara (Percosia) equestris equestris*** (Duftschmid, 1812)
New material: ***XX***: 1♀ *[2]*.

95. ***Zabrus (Zabrus) tenebrioides*** (Goeze, 1777)
New material: N Lyulyak vill., 42°31'25''N, 25°39'26''E, 517 m, pitfall trap, 1♀, 15.VI.2018, DG.

96. ***Zabrus (Pelor) spinipes spinipes*** (Fabricius, 1798)
"Sredna Gora/Karadzhadag" near Turiya vill. (Yoakimov 1904). New material: ***Do***: 1♂ *[1]*.

97. ***Anisodactylus (Anisodactylus) binotatus*** (Fabricius, 1787)
New material: ***I***: 1♂ *[1]*.

98. ***Gynandromorphus etruscus*** (Quensel en Schönherr, 1806)
New material: ***R03***: 1♀1♂ *[1]*, 1♀ *[2]*, 4♀7♂ *[3]*.

99. ***Diachromus germanus*** (Linnaeus, 1758)
New material: ***R03***: 1♀ *[3]*.

100. ***Dicheirotrichus (Trichocellus) discicollis*** (Dejean, 1829)
New material: ***XII***: 1♀ *[1]*.

101. ***Stenolophus (Stenolophus) teutonus*** (Schrank, 1781)
"Sredna Gora/Karadzhadag" near Turiya vill. (Yoakimov 1904). New material: ***Hr***: 1♀, under lamp, 18.VII.2018.

102. ***Stenolophus (Stenolophus) abdomialis persicus*** Mannerheim, 1844
New material: ***R03***: 1♂ *[2]*.

103. ***Acupalpus (Acupalpus) meridianus*** (Linnaeus, 1760)
New material: ***R03***: 1♂ *[2]*.

104. ***Acupalpus (Acupalpus) dubius*** Schilsky, 1888
New material: ***Hr***: 1♀, under lamp, 9.VI.2018.

105. ***Parophonus (Parophonus) maculicornis*** (Duftschmid, 1812)
New material: ***X***: 1♂ *[1]*; ***XII***: 1♀ *[1]*.

106. ***Parophonus (Parophonus) laeviceps*** (Ménétriés, 1832)
New material: ***R02***: 1♀5♂ *[1]*, 6♀6♂ *[2]*, 1♀ *[3]*; ***R03***: 1♀1♂ *[1]*.

107. ***Parophonus (Parophonus) mendax*** (P. Rossi, 1790)
New material: ***XIII***: 1♀ *[1]*; ***R02***: 1♀ *[2]*; ***R03***: 1♀1♂ *[1]*; ***G02***: 1♂ *[1]*.

108. ***Ophonus (Metophonus) laticollis*** Mannerheim, 1825
New material: ***XX***: 1♂ *[1]*, 6♀18♂ *[2]*; ***XXI***: 4♀5♂ *[1]*; ***XXII***: 1♂ *[1]*; N Zmeevo vill., 42°30'11.8''N, 25°36'01.5''E, 445 m, grasses and shrubs, 1♂, 24.IV.2018, DG.

109. ***Ophonus (Metophonus) parallelus*** (Dejean, 1829)
New material: ***XIX***: 1♂ *[2]*.

110. ***Ophonus (Metophonus) brevicollis*** (Audinet-Serville, 1821)
New material: ***XIX***: 2♂ *[2]*; ***Hr***: 1♀, 14.VII.2018; Svezhen vill., 42°30'17''N, 25°01'32''E, 750 m, at light, 1♀1♂, 20.VII.2018, DGr.

111. ***Ophonus (Hesperophonus) azureus*** (Fabricius, 1775)

New material: ***XVIII***: 1♀3♂ *[1]*, 1♀1♂ *[2]*; ***XIX***: 1♀ *[1]*; ***Hr***: 1♀, 18.IV.2018; ***R02***: 1♀1♂ *[1]*; ***R03***: 1♂ *[3]*; ***G03***: 1♀2♂ *[3]*; Varben vill., 42°25'16''N, 24°58'00''E, 328 m, yard, 1♂, 08.VII.2019, TT.

112. ***Ophonus (Hesperophonus) cribricollis*** (Dejean, 1829)
New material: ***Do***: 2♂ *[2]*; ***R02***: 2♂ *[2]*, 1♀ *[3]*; ***R03***: 1♀ *[2]*; ***G02***: 2♂ *[1]*, 2♂ *[2]*; ***G03***: 1♀1♂ *[1]*, 5♂ *[2]*, 1♂ *[3]*; N Korten vill., 42°34'14''N 25°59'52''E, 335 m, 1♂, 18.VI.2020, TT.

113. ***Ophonus (Ophonus) sabulicola*** (Panzer, 1796)
New material: ***XIX***: 2♀1♂ *[1]*, 1♀15♂ *[2]*; ***XX***: 1♀ *[2]*; ***R03***: 1♂ *[2]*; ***G03***: 1♂ *[3]*.

114. ***Harpalus (Semiophonus) signaticornis*** (Duftschmid, 1812)
New material: ***XIII***: 2♀ *[1]*; ***XVIII***: 1♀ *[1]*; ***XIX***: 1♀ *[1]*; ***R02***: 1♀1♂ *[1]*, 2♀ *[2]*; ***G03***: 1♂ *[2]*.

115. ***Harpalus (Pseudophonus) rufipes*** (De Geer, 1774)
New material: ***XIX***: 1♂ *[2]*; ***XX***: 6♀4♂ *[2]*; ***R02***: 2♂ *[3]*; ***R03***: 4♀3♂ *[3]*; ***Hr***: 1♂, 14.VI.2018.

116. ***Harpalus (Pseudoophonus) griseus*** (Panzer, 1796)
New material: ***R03***: 1♂ *[3]*; ***Sv***: 1♀, at light, 21.VII.2018; ***Hr***: 1♂, under lamp, 18.VII.2018.

117. ***Harpalus (Harpalus) rufipalpis rufipalpis*** Sturm, 1818
New material: ***VIII***: 1♀1♂ *[2]*; Mezhdenik Hill, 42°38'15''N, 25°52'59''E, 260 m, near Zhrebchevo Dam, 1♂, 18.VI.2020, TT.

118. ***Harpalus (Harpalus) honestus*** (Duftschmid, 1812)
New material: ***VII***: 2♀ *[1]*, ***XIX***: 1♂ *[2]*.

119. ***Harpalus (Harpalus) rubripes*** (Duftschmid, 1812)
New material: ***V***: 1♀1♂ *[1]*; ***X*** 1♂ *[1]*; ***XII***: 2♀ *[1]*, 1♀ *[2]*; ***XVIII***: 2♂ *[1]*, 1♀1♂ *[2]*; ***XIX***: 1♀1♂ *[1]*; ***R03***: 1♀ *[1]*; ***G02***: 1♂ *[3]*; ***G03***: 2♀3♂ *[1]*, 2♀2♂ *[2]*, 1♀1♂ *[3]*.

120. ***Harpalus (Harpalus) attenuatus*** Stephens, 1828
New material: ***XVIII***: 1♀ *[1]*, 1♀ *[2]*; ***XIX***: 1♂ *[2]*; ***Do***: 1♀ *[2]*; ***G02***: 1♀1♂ *[2]*, 4♀2♂ *[3]*; ***G03***: 1♂ *[3]*.

121. ***Harpalus (Harpalus) atratus*** Latreille, 1804
"Sredna Gora/Karadzhadag" near Turiya vill. (Yoakimov 1904). New material: ***X***: 1♀ *[1]*; ***XV***: 1♀ *[1]*; ***XVII***: 1♀ *[1]*; ***XXI***: 1♀1♂ *[1]*, 1♀ *[2]*; ***Mr***: 1♀ *[3]*; ***Sv***: 1♂ *[1]*; ***Ch***: 1♀ *[1]*, 1♀ *[2]*.

122. ***Harpalus (Harpalus) serripes serripes*** (Quensel, 1806)
"Sredna Gora/Karadzhadag" near Turiya vill. (Yoakimov 1904). New material: ***XII***: 2♀1♂ *[1]*, 1♀1♂ *[2]*; ***XIII***: 1♂ *[2]*; ***G03***: 1♀2♂ *[2]*; ***Hr***: 1♀, 15.VII.2018; ***Do***: 1♀ *[2]*, 1♀ *[3]*; NE Rozovets vill., 42°29'19''N, 25°08'57''E, 825 m, beech forest, 1♂, 20.VI.2020, TT; SW Chehlare vill., 1♂, 23.VI.2018, YP; S Shanovo vill., 42°31'52.0''N, 25°38'41.9''E, 435 m, oak-hornbeam forest, 1♀, 7.VI.2018, DG.

123. ***Harpalus (Harpalus) flavicornis*** Dejean, 1829
New material: ***XIII***: 1♂ *[1]*, 1♂ *[2]*; ***XVIII***: 11♂ *[1]*, 2♀6♂ *[2]*, 1♀ *[3]*; ***XIX***: 1♀4♂ *[1]*; ***XXI***: 1♂ *[1]*; ***R02***: 2♀2♂ *[3]*; ***G02***: 1♀ *[2]*, 1♀1♂ *[3]*; ***G03***: 2♂ *[1]*, 1♀ *[2]*; Varben vill., 42°25'16''N, 24°58'00''E, 328 m, house yard, 1♂, 01.VI.2019, TT; NE Varben vill., 42°25'42''N, 24°58'27''E, 380 m, pasture, 1♂, 01.VI.2019, TT.

124. ***Harpalus (Harpalus) pumilus*** Sturm, 1818
New material: ***G03***: 1♂ *[1]*, 1♂ *[2]*; ***Hr***: 1♀, 21.IV.2018.

125. ***Harpalus (Harpalus) picipennis*** (Duftschmid, 1812)
New material: ***XIX***: 1♀ *[1]*.

126. ***Harpalus (Harpalus) subcylindricus*** Dejean, 1829
New material: ***XVIII***: 1♀ *[1]*; ***XX***: 1♀1♂ *[1]*; ***G03***: 1♀3♂ *[1]*.

127. ***Harpalus (Harpalus) flavescens*** (Piller et Mitterpacher, 1783)
"Sredna Gora/Karadzhadag" near Turiya vill. (Yoakimov 1904).

128. ***Harpalus (Harpalus) tardus*** (Panzer, 1796)
New material: ***V***: 5♀2♂ *[1]*; ***X***: 3♀1♂ *[1]*; ***XI***: 2♀2♂ *[1]*, 1♀1♂ *[3]*; ***XII***: 36♀39♂ *[1]*, 2♂ *[3]*; ***XIII***: 1♀2♂ *[1]*; ***XIV***: 2♂ *[1]*; ***XV***: 3♀1♂ *[1]*; ***XVI***: 1♂ *[1]*; ***XVIII***: 2♀3♂ *[1]*, 1♀ *[2]*; ***XIX***: 1♀1♂ *[1]*, 1♂ *[2]*; ***XX***: 19♀29♂ *[1]*, 1♂ *[2]*; ***XXI***: 11♀9♂ *[1]*, 1♂ *[2]*; ***Do***: 1♀ *[2]*; ***Sv***: 2♀1♂ *[1]*; ***R03***: 2♀1♂ *[1]*, 1♀1♂ *[2]*; ***G03***: 9♀3♂ *[1]*, 1♂ *[2]*; N Korten vill., 42°34'14''N 25°59'52''E, 335 m, 1♀, 18.VI.2020, TT.

129. ***Harpalus (Harpalus) albanicus*** Reitter, 1900

New material: ***XVIII***: 1♀1♂ *[1]*; ***XIX***: 1♀3♂ *[1]*; ***XX***: 3♀1♂ *[1]*; ***G02***: 2♂ *[1]*; ***Hr***: 1♀, 11.IV.2018.

130. ***Harpalus (Harpalus) smaragdinus*** (Duftschmid, 1812)
"Sredna Gora/Karadzhadag" near Turiya vill. (Yoakimov 1904).

131. ***Harpalus (Harpalus) cupreus fastuosus*** Faldermann, 1836
New material: ***R03***: 2♀4♂ *[1]*, 3♀2♂ *[2]*, 2♀3♂ *[3]*.

132. ***Harpalus (Harpalus) dimidiatus*** (P. Rossi, 1790)
New material: ***G03***: 1♂ *[1]*, 3♀1♂ *[2]*.

133. ***Harpalus (Harpalus) caspius*** (Steven, 1806)
New material: ***XVII***: 1♀ *[1]*; ***XVIII***: 4♀3♂ *[1]*, 3♀ *[2]*; ***XIX***: 3♀4♂ *[1]*; ***XX***: 1♂ *[1]*; ***Do***: 1♂ *[1]*; ***Sv***: 1♂ *[3]*; ***G03***: 1♀3♂1ex. *[1]*; N Lyulyak vill., 42°31'25"N, 25°39'26"E, 517 m, 1♂, 15.VI.2018, DG.

134. ***Harpalus (Harpalus) pygmaeus*** Dejean, 1829
New material: ***G02***: 1♀ *[2]*; ***G03***: 1♀ *[2]*.

135. ***Harpalus (Harpalus) hospes hospes*** Sturm, 1818
New material: ***XIX***: 11♀16♂ *[1]*, 6♀11♂ *[2]*; ***R02***: 1♀ *[1]*; ***R03***: 2♀1♂ *[1]*; Varben vill., 42°25'16"N, 24°58'00"E, 328 m, house yard, 1♀, 20.VI.2020, TT.

136. ***Harpalus (Harpalus) affinis*** (Schrank, 1781)
New material: ***R02***: 1♂ *[1]*, 1♂ *[2]*; ***Hr***: 1♂, 22.V.2018, 1♂, 1.X.2018.

137. ***Harpalus (Harpalus) distinguendus distinguendus*** (Duftschmid, 1812)
New material: ***IV***: 1♀ *[3]*; ***V***: 1♂ *[1]*; ***X***: 1♀ *[3]*; ***XIX***: 2♀ *[1]*, 1♀ *[2]*, 1♂ *[3]*; ***XX***: 2♂ *[1]*; ***R02***: 6♀4♂ *[1]*, 20♀9♂ *[2]*; ***R03***: 4♀3♂ *[1]*, 10♀3♂ *[2]*, 1♀ *[3]*; ***G02***: 9♀2♂ *[1]*, 4♀7♂ *[2]*, 3♀3♂ *[3]*; ***G03***: 1♂ *[1]*; ***Hr***: 1♀, 31.III.2018, 2♀1♂, 18.IV.2018, 1♂, 22.IV.2018; NE Rozovets vill., 42°29'19"N, 25°08'57"E, 825 m, beech forest, 1♀, 20.VI.2020, TT.

138. ***Harpalus (Harpalus) saxicola*** Dejean, 1829
New material: ***G02***: 2♀1♂ *[1]*, 1♀ *[2]*, 1♀ *[3]*.

139. ***Harpalus (Harpalus) angulatus scytha*** Tschitschérine, 1899
New material: ***G02***: 3♀ *[3]*.

140. ***Acinopus (Acinopus) picipes*** (Olivier, 1795)
New material: ***III***: 1♀ *[2]*; ***R02***: 3♂ *[3]*; ***G02***: 1♀1♂ *[3]*.

141. ***Acinopus (Oedematicus) megacephalus*** (P. Rossi, 1794)
New material: ***R02***: 3♂ *[3]*; ***G03***: 1♂ *[3]*.

142. ***Carterus (Carterus) dama*** (P. Rossi, 1792)
New material: ***R02***: 1♀ *[3]*.

143. ***Ditomus calydonius calydonius*** (P. Rossi, 1790)
New material: ***G03***: 1♀ *[3]*.

144. ***Dixus obscurus*** (Dejean, 1825)
New material: ***XIII***: 1♀ *[1]*.

145. ***Amblystomus metallescens*** (Dejean, 1829)
New material: ***R02***: 1♂ *[2]*.

146. ***Amblystomus rectangulus*** Reitter, 1883
New material: ***R03***: 1♀ *[1]*.

147. ***Chlaenius (Dinodes) decipiens*** (L. Dufour, 1820)
New material: ***XIX***: 2♀6♂ *[2]*; ***R02***: 1♀ *[2]*; ***R03***: 1♂ *[2]*.

148. ***Chlaenius (Trichochlaenius) aeneocephalus aeneocephalus*** Dejean, 1826
New material: ***XIX***: 1♀ *[1]*; ***R02***: 1♀1♂ *[1]*; ***R03***: 1♂ *[1]*, 3♀1♂ *[2]*.

149. ***Chlaenius (Chlaeniellus) nitidulus*** (Schrank, 1781)
New material: ***X***: 2♀ *[1]*.

150. ***Chlaenius (Chlaeniellus) vestitus*** (Paykull, 1790)
"Sredna Gora/Karadzhadag" near Turiya vill. (Yoakimov 1904). New material: Hrishteni vill., 42°27'03.8"N, 25°42'09.2"E, 202 m, grasses near brook, 1♀, 12.V.2018, DG.

151. ***Licinus (Licinus) depressus*** (Paykull, 1790)
New material: ***R02***: 1♀1♂ *[3]*.

152. ***Licinus (Licinus) cassideus cassideus*** (Fabricius, 1792)
New material: ***XIX***: 2♀ *[2]*; near the "Russian road", 42°29'19.2''N, 25°46'16.6''E, 286 m, shrubs in a limestone terrain, near river, 1♀, 13.IV.2018, DG.
153. ***Lebia (Lebia) cruxminor cruxminor*** (Linnaeus, 1758)
"Sredna Gora/Karadzhadag" near Turiya vill. (Yoakimov 1904).
154. ***Lebia (Lebia) humeralis*** Dejean, 1825
New material: ***G02***: 1♀5♂ *[2]*.
155. ***Lebia (Lebia) scapularis scapularis*** (Geoffroy, 1785)
New material: ***G02***: 1♀1♂ *[1]*.
156. ***Dromius (Dromius) quadrimaculatus*** (Linnaeus, 1758)
New material: ***Sv***: 1♂, at light, 24.VIII.2018.
157. ***Philorhizus notatus*** (Stephens, 1827)
New material: ***I***: 1♂ *[3]*; **X**: 1♂ *[3]*; ***XIII***: 1♀1♂ *[3]*.
158. ***Syntomus obscuroguttatus*** (Duftschmid, 1812)
New material: ***XX***: 2♂ *[2]*; ***R02***: 1♂ *[2]*; ***R03***: 2♀ *[1]*.
159. ***Syntomus pallipes*** (Dejean, 1825)
New material: ***XII***: 2♀ *[1]*; ***XXI***: 1♀ *[1]*.
160. ***Microlestes corticalis*** (L. Dufour, 1820)
New material: ***R03***: 1♂ *[2]*.
161. ***Microlestes fissuralis*** (Reitter, 1901)
New material: ***XIX***: 1♀2♂ *[2]*; ***R02***: 1♀2♂ *[1]*, 2♂ *[2]*, 4♀3♂ *[3]*; ***R03***: 1♂ *[2]*; ***G02***: 8♀2♂ *[2]*, 3♀ *[3]*; ***G03***: 5♀4♂ *[1]*, 5♀1♂ *[2]*, 5♀1♂ *[3]*.
162. ***Microlestes fulvibasis*** (Reitter, 1901)
New material: ***R02***: 1♀ *[2]*; ***R03***: 1♂ *[2]*; ***G02***: 4♀10♂ *[2]*, 1♂ *[3]*.
163. ***Microlestes luctuosus luctuosus*** Holdhaus, 1904
New material: ***XIX***: 2♂ *[3]*.
164. ***Microlestes maurus maurus*** (Sturm, 1827)
New material: ***XIX***: 2♀8♂ *[3]*; ***R02***: 1♂ *[3]*; ***G02***: 1♀1♂ *[2]*, 1♀1♂ *[3]*; ***G03***: 4♀2♂ *[1]*, 1♀2♂ *[3]*.
165. ***Microlestes minutulus*** (Goeze, 1777)
New material: ***I***: 1♂ *[1]*; ***XVIII***: 1♀1♂ *[3]*; ***XIX***: 4♀3♂ *[2]*; ***R02***: 1♀2♂ *[1]*, 5♀2♂ *[2]*, 3♀ *[3]*; ***R03***: 23♀14♂ *[1]*, 10♀6♂ *[2]*, 1♀2♂ *[3]*; ***G02***: 1♂ *[1]*, 3♀1♂ *[2]*; ***G03***: 1♀ *[1]*, 5♀1♂ *[2]*; NE Varben vill., 42°25'42''N, 24°58'27''E, 380 m, pasture, 1♀, 01.VI.2019, TT; Hrishteni vill., 42°27'03.8''N, 25°42'09.2''E, 202 m, grasses near brook, 1♂, 12.V.2018, DG.
166. ***Microlestes negrita negrita*** (Wollaston, 1854)
New material: ***R02***: 2♀ *[1]*, 1♀ *[2]*.
167. ***Cymindis (Cymindis) axillaris axillaris*** (Fabricius, 1794)
New material: ***XIII***: 1♀ *[3]*.
168. ***Drypta (Drypta) dentata*** (P. Rossi, 1790)
New material: Starozagorski Min. Bani, 42°27'02''N, 25°29'39''E, 382 m, 1ex., 01.VI.2017, TT.
169. ***Polystichus connexus*** (Geoffroy in Fourcroy, 1785)
New material: ***R02***: 1♂ *[1]*.
170. ***Aptinus bombarda*** (Illiger, 1800)
"Sredna Gora/Karadzhadag" near Turiya vill. (Yoakimov 1904). New material: ***III***: 60♀43♂ *[1]*, 153♀71♂1ex. *[2]*; ***IV***: 1♂ *[1]*; ***V***: 1ex. *[2]*; ***VII***: 1♀ *[2]*; ***IX***: 10♀13♂1ex. *[1]*, 25♀8♂3ex. *[2]*, 1♂1ex. *[3]*; ***XXII***: 18♀16♂ *[1]*, 24♀13♂ *[2]*; ***Ka***: 6♀ *[1]*.
171. ***Brachinus (Brachinus) alexandri*** F. Battoni, 1984
New material: ***R03***: 1♀ *[2]*.
172. ***Brachinus (Brachinus) crepitans*** (Linnaeus, 1758)
New material: ***XII***: 1♀1♂ *[1]*, 4♀7♂ *[2]*; ***XVII***: 1♀ *[1]*; ***XIX***: 8♀5♂ *[1]*, 3♀3♂ *[2]*; ***XX***: 2♀5♂ *[1]*, 4♀4♂ *[2]*; ***XXI***: 45♀32♂ *[1]*.

173. ***Brachinus (Brachinus) psophia*** Audinet-Serville, 1821

New material: ***R02***: 4♀1♂ *[1]*, 1♀ *[2]*, 1♂ *[3]*; ***R03***: 3♀2♂ *[1]*, 4♀1♂ *[2]*, 2♀3♂ *[3]*.

174. ***Brachinus (Brachynidius) brevicollis*** Motschulsky, 1844

New material: ***XX***: 1♂ *[2]*.

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

New material: ***XII***: 1♀3♂ *[1]*, 5♀5♂ *[2]*; ***XVIII***: 1♂ *[1]*; ***XIX***: 1♂ *[1]*; ***XX***: 1♀ *[1]*; ***XXI***: 42♀37♂ *[1]*; ***XXII***: 1♀ *[1]*; ***R02***: 19♀16♂ *[1]*, 1♀6♂ *[2]*; ***R03***: 13♀10♂ *[1]*, 7♀4♂ *[2]*; ***G03***: 2♀2♂ *[1]*, 2♀6♂ *[2]*; ***Hr***: 1♀, 26.IV.2018, 1♀, 9.V.2018; W Stara Zagora, 42°24'49.8''N, 25°32'49.4''E, 389 m, meadow with bushes, in puddle, 1♂, 11.VI.2018, DG; W Lyulyak vill., 42°30'36.4''N, 25°40'17.0''E, 414 m, shrubs and sparse forest, in leaf litter of *Acer* sp., 1♂, 25.X.2018, DG.

Only 36 species are known for Sarnena Gora from the literature. Of them, 32 species were recorded by Yoakimov (1904), Nedelkov (1909) reported two species, Buresh & Kantardzhieva (1928) reported seven species, *Molops alpestris* was reported by Guéorguiev *et al.* (1997), and *Amara aenea* was reported by Hieke & Wrase (1988). During the field work we collected many of them, with the exception of 11 species (*Carabus cancellatus*, *Perileptus areolatus*, *Tachyta nana*, *Bembidion subfasciatum*, *B. femoratum*, *Pterostichus melanarius*, *Sphodrus leucophthalmus*, *Amara municipalis*, *Harpalus flavescens*, *H. smaragdinus* and *Lebia cruxminor*). All other 138 species are new for this part of the mountain. *Amblystomus rectangulus* and *Acupalpus dubius* are reported as new and rare species for Bulgaria (Teofilova *et al.* 2020), but those are the same records presented in this paper.

New high altitude boundaries were established for the distribution of nine species, but it would be tenuous to claim these new findings are evidence for a real shift of the species distribution to higher altitude. This is probably more reflective of lesser knowledge about the ecology of these species and their distribution in Bulgaria. These are: *Acinopus picipes* (so far known only from below 1000 m a.s.l., now found at 1100 m in sampling site *III*), *Amblystomus metallescens* (so far known only from below 110 m, now found at 280 m in *R02*), *Apotomus clypeonitens* (so far known only from below 107 m, now found at 288 m in *R03*), *Brachinus brevicollis* (so far known only from below 300 m, now found at 363 m in sampling site *XX*), *Calathus longicollis* (so far known only from below 180 m, now found at 366 m in sampling site *XII*, and at 812 m in *Ka*), *Dicheirotrichus discicollis* (so far known only from below 35 m, now found at 366 m in sampling site *XII*), *Ophonus brevicollis* (so far known only from below 700 m, now found at 750 m in Svezhen vill.), *Parophonus laeviceps* (so far known only from below 180 m, now found at 288 m in *R03*), and *Poecilus cursorius* (so far known only from below 240 m, now found at 288 m in *R03*).

The richest tribes are Harpalini (50 species), Pterostichini (25 species), Amarini (18 species), Lebiini (15 species), and Carabini (12 species). Similar ratio of the number of species in the tribes was found in the Vrachanska Planina Mts (Western Stara Planina Mts) (Teofilova 2019), with the exception of Lebiini, which are more numerous here probably due to their higher presence in the sampling sites near Zelenikovo vill. (in the lowest belts of Sarnena Gora). Harpalini and Amarini include mostly ecologically plastic carabids. Carabini and Pterostichini are typical forest dwellers; most of them are stenotopic and any impact on the forest habitats where they occur, also affects the structure of their communities.

Similarly to the carabid fauna of the Vrachanska Planina Mts (Teofilova 2019), the most species rich genera are *Harpalus* (24 species), *Amara* (15 species), *Pterostichus* (11 species), and *Carabus* (9 species).

It seems that the region of the Sarnena Gora keeps a very diverse ground beetle fauna and has a significant conservation value. Currently three relicts (*Carabus hortensis*, *Myas chalybaeus*, and *Xenion ignitum*) and 14 endemic species and subspecies are known, of which Bulgarian regional endemics are 2 subspecies, Bulgarian endemics are 3 taxa (2 species and 1 subspecies), Balkan endemics are 7 taxa (1 species and 6 subspecies), and 2

species are Balkan subendemic (Table 2). *Carabus intricatus* is included in the IUCN Red List as "Near Threatened". *Carabus scabrosus* is included in the Red Data Book of Bulgaria as "Vulnerable" (Golemanski *et al.* 2015).

Some rare and stenotopic species also occur in the studied region: *Abax parallelus*, *Amara communis*, *Aptinus bombarda*, some *Bembidion* spp. *Carabus cancellatus*, *C. granulatus*, *C. scabrosus*, *Cychrus semigranosus*, most of the *Molops* spp., *Pterostichus incommodus*, *Pt. merklii*, *Pt. quadrifoveolatus*, *Pt. vecors*, *Tapinopterus cognatus*, *Xenion ignitum*, etc. Some of the species (e.g. *Calosoma inquisitor*, and many of the *Carabus* spp.) have become rare under the influence of anthropogenic pressures, changes in their primary habitats, and the use of chemical agents in the agriculture. In most cases these species are attached to a limited type of biotope and require specific abiotic and biotic conditions, making them vulnerable to destruction of their habitats. A major factor in the preservation of the stenotopic species is the conservation of their primary habitats.

Bulgarian endemics, some Balkan endemics with limited distribution and endangered and internationally protected species can be regarded as taxa of world importance. Balkan endemic species as a whole have European significance, and relicts, nationally protected and rare forms have national significance.

Table 2. List of the endemic ground beetles in Sarnena Sredna Gora Mts.

Species	Level
Molops alpestris kalofericus	Regional Bulgarian
Molops dilatatus angulicollis	Regional Bulgarian
Pterostichus vecors	Bulgarian
Pterostichus merklii	Bulgarian
Tapinopterus cognatus kalofirensis	Bulgarian
Carabus scabrosus scabrosus	Balkan
Carabus violaceus azuresens	Balkan
Cychrus semigranosus balcanicus	Balkan
Molops piceus bulgaricus	Balkan
Laemostenus cimmerius weiratheri	Balkan
Pterostichus melas depressus	Balkan
Trechus irenis	Balkan
Myas chalybaeus	Balkan subendemic
Xenion ignitum	Balkan subendemic

Zoogeographical analysis on species level shows that the European complex (52 species, 30% of all) and Mediterranean (*sensu lato*) complex (51 species, 29% of all) prevail. They are closely followed by the Northern Holarctic and European-Siberian complex with 40 species (23%). European-Asiatic complex has 23 species (13%), and Endemic complex consists of 8 species (5%) (Figure 2).

We found greatest number of species for the European-Neareastern, European-Central Asian, European, and Palaearctic categories (Table 3). Palaearctic, European-Central Asian, and European-Neareastern categories were the most species rich in Vrachanska Planina Mts too, but there the Northern Holarctic complex prevailed (having 37% of all species), the Mediterranean complex had only 17% of all species, and the share of the endemics was greater (11%) (Teofilova 2019). Greater number of endemics was also established in the central part of the Stara Planina Mts – in "Leshnitsa" Reserve (Teofilova 2016).

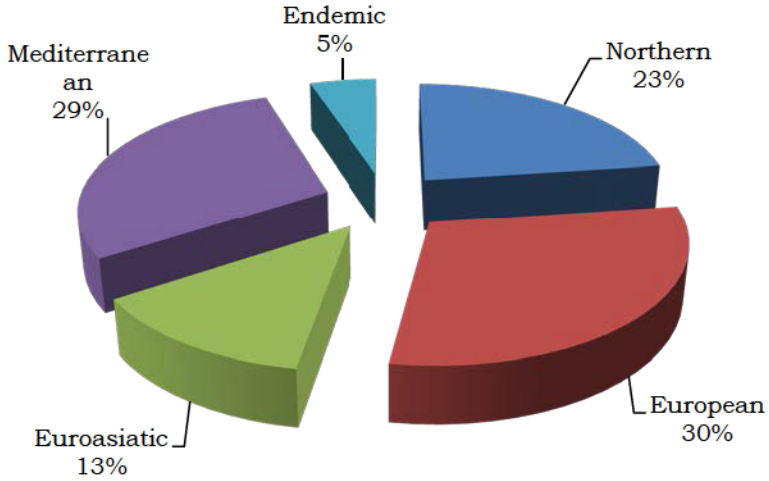

Fig. 2. Distribution of the carabid species among the zoogeographical complexes.

Table 3. Zoogeographical categories of the ground beetles in Sarnena Gora (on species level).

Complex	Zoogeographical element	species	
		No	%
Northern Holarctic and European-Siberian	Holarctic	7	4.0
	Palaearctic	12	6.9
	Western Palaearctic	7	4.0
	European-Siberian	10	5.7
	European and West Siberian	4	2.3
European	European-Neareastern	21	12.0
	European	13	7.4
	Central and Eastern European and Neareastern	8	4.6
	Central and Eastern European	9	5.1
	Southern and Eastern European	1	0.6
Euroasiatic	Euroasiatic steppe and forest-steppe complex	6	3.4
	European and Central Asian	17	9.7
Mediterranean	European-Central Asian-Mediterranean	10	5.7
	European-Neareastern-Mediterranean	8	4.6
	Mediterranean-Central Asian	4	2.3
	Mediterranean-Neareastern	3	1.7
	Mediterranean	1	0.6
	Eastmediterranean	1	0.6
	Pontic-Submediterranean	2	1.1
	South European and Northmediterranean	8	4.6
	Northmediterranean-Central Asian	2	1.1
	Balkan-Central Asian	2	1.1
	Balkan-Neareastern	10	5.7
Endemic	Balkan subendemic (+ Balkan-Carpathian)	2	1.1
	Balkan endemic	4	2.3
	Bulgarian endemic	2	1.1

The carabid fauna of the Sarnena Gora is extremely heterogeneous and diverse in zoogeographical terms, given its contact areas with the Central Stara Planina Mts and Sashtinska Sredna Gora Mts on the one hand, and the Upper Thracian Lowland and the Podbalkan Valleys, on the other. The river systems of the rivers of Maritsa and Tundzha are important corridors and refugia for the expansion of meso-therophilic forms, and the southern and eastern borders of the subregion of the Tundzha Hilly Lowland are in direct contact with the biogeographical subregions of the Southern Black Sea and Lower Maritsa Valley, where the xerophilous and Neareastern biota penetrates through. The proximity of the mountain to the Thracian and Tundzha Hilly Lowlands results with increased presence of Mediterranean species (almost 30%). The relatively low proportion of the Pontic forms is also noticeable, probably resulting from the relative remoteness of the Black Sea Coast and the mesophilic microclimate created by the river systems and mountain ranges.

The mountain carabid fauna, despite the very low ridge parts of the Sarnena Gora, is well differentiated and close in composition to that of the Central Stara Planina Mts and Sashtinska Sredna Gora Mts. The limits of this fauna conditionally overlap with the areal of the common beech (*Fagus sylvatica* L.), which on the southern slopes starts at about 850 m a.s.l., and on the northern – at about 550 m a.s.l. At these heights were found complexes of more than 50 mountainous and forest mesophiles, such as the endemic species and subspecies, as well as a large part of the European, Euro-Siberian, and Holarctic species, most of which are characteristic of the other Bulgarian mountains, too. Typical mountain species are: *Carabus hortensis*, *C. violaceus*, *C. intricatus*. *Cychrus semigranosus*, and the endemic *Molops* spp., *Tapinopterus cognatus*, *Pterostichus vecors*. In the same time, during our study we found specific differences with the mountain fauna of the Central Stara Planina Mts, which is naturally connected with Sarnena Sredna Gora through the Strazhata and Mezhdenik Ridges. Specific to Sarnena Gora are *Carabus scabrosus* and *C. hortensis*, and in Shipchenka Planina Mts specific are *C. gigas* Creutzer, 1799, *C. versicolor* I. Frivaldszky von Frivald, 1835, and *Platynus proximus* (J. Frivaldszky, 1879) (Teofilova 2016).

There is a common regularity in different regions in Bulgaria about the distribution of the complexes of the two main types of biota – northern and southern. The established proportion in the Sarnena Gora is 58% to 42%, of which, respectively, almost 30% are Mediterranean thermophilous and xerophilous species, and another 30% are European mesophilous forest species. A similar distribution of the two main faunal complexes is established for the Vrachanska Planina Mts (Teofilova 2019) and "Leshnitsa" Reserve in the Central Stara Planina Mts (Teofilova 2016). The difference in the share of Mediterranean and Eurasian xerophiles in the southern carabid fauna is probably due to the different geographical location and the proximity of Sarnena Gora to territories with Mediterranean climatic influence and to the rivers of the Eastern Aegean catchment, which effect as a Mediterranean corridor and refugium is evident. The ratio of the northern to southern biota is 55%:45%, both in NW Bulgaria (the Zlatiya Plateau) (Teofilova & Kodzhabashev 2020b), and NE Bulgaria ("Srebarna" Reserve) (Kodzhabashev 2016). In Southern Bulgaria, this ratio is 35%:65% in the Eastern Rhodopes (Teofilova & Kodzhabashev 2020a), and in pseudomaquis habitats in Struma Valley and lower belt of the Pirin Mts (Teofilova 2020).

Conclusions

The present study proves that the region of the Sarnena Sredna Gora Mts keeps a very rich, diverse and zoogeographically heterogeneous ground beetle fauna, and has a significant conservation value.

When analyzing the zoogeographic distribution of the mountain faunistic complex of Sarnena Gora, we established a regularity relating the lower limits of the mountain on the

southern and northern slopes. The mountain elements forming the specific psychrophilic and mesophilic complex on the southern slopes of the mountain appear at about 850 m a.s.l., and on the northern slopes – at about 550 m a.s.l. In this case, it also coincides with the distribution of the beech, which can be used for practical purposes for determination of the lower limit of the middle-mountain belt of Sarnena Gora.

The insufficient research in the area and the large carabid species richness suggest that future targeted studies would contribute to the enrichment of the species list presented here. Further studies are needed in more habitats, on a larger area and in different parts of the mountain, with sufficient regularity and longer duration, focusing on the application of different methods for collection of biological material, in order to ensure a more qualitative coverage of the local biodiversity and a traceability of the phenology of the species. It would be appropriate to analyse the preimaginal stages of the ground beetles too.

In order to assure the preservation of the natural habitats and significant species, a proclamation of some protected areas and/or zones is recommendable.

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Fauna of Sarnena Sredna Gora Mts, Part 1
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Odonata (Zygoptera and Anisoptera) of the Sarnena Sredna Gora Mts

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Abstract. Checklist of the dragonflies (Order Odonata) of the Sarnena Sredna Gora and its adjacent areas contains 26 species from 7 families: Calopterygidae (2 sp.), Coenagrionidae (7 sp.), Lestidae (1 sp.), Platycnemididae (1 sp.), Aeshnidae (1 sp.), Gomphydae (4 sp.) and Libellulidae (10 sp.).

Key words: fauna, dragonflies, Sarnena Sredna Gora, Bulgaria.

Introduction

First data about Odonata of Sarnena Sredna Gora Mountains is found in the publication of Nedelkov (1909), but this insect order has not been subject of a special study in the region and the data is relatively scarce. Here we present a synopsis of all literature data with some new records. From all 71 species known to occur in Bulgaria (Gainzarain 2017), 26 species (36.6%) have been recorded in the region, including and *Sympetrum striolatum* (Charpentier, 1840), reported here as a new record.

Material and Methods

The information presented in this paper is from the followingsources: Nedelkov (1909, 1923), Beshovski (1964), Rusev *et al.* (1984), Yaneva & Rusev (1985), Mauersberger (1990). All new records are on the base of the authors observations. The species were identified by photographs. The valid species names are according to "Fauna Europaea".

The studied area is presented in Fig. 1.

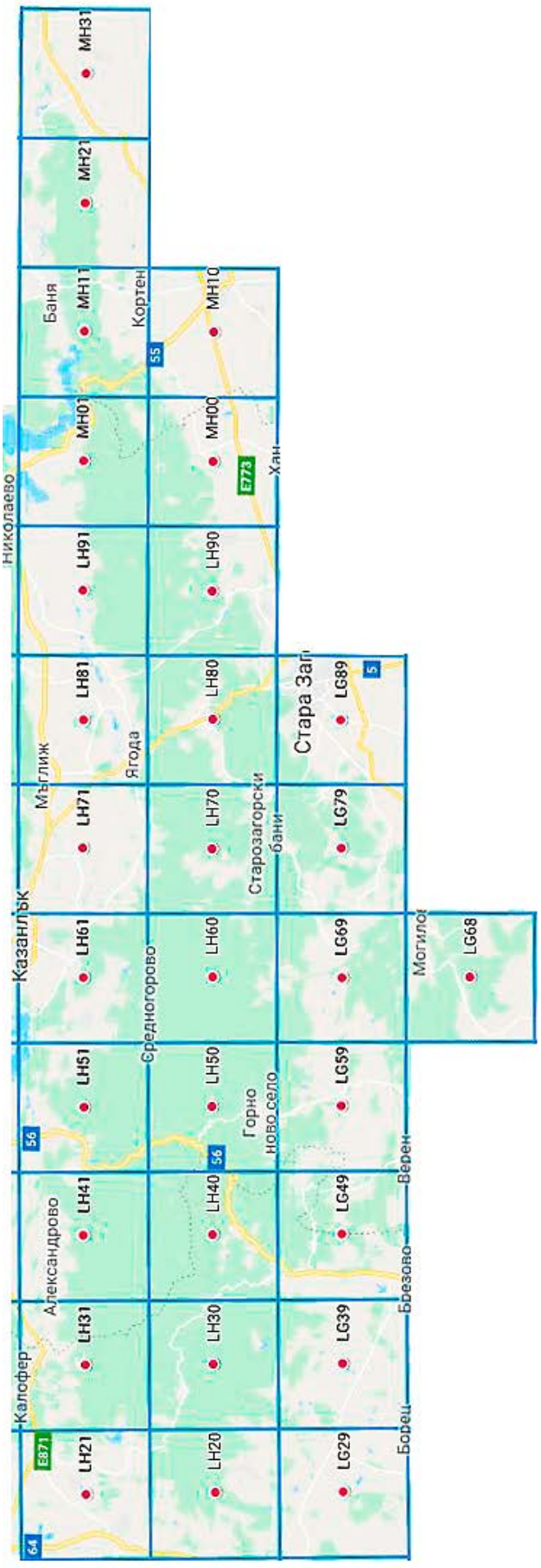

Fig. 1. Map of the studied area with 10x10 km UTM-squares.

Faunistic list

SUBORDER ZYGOPTERA

FAMILY CALOPTERYGIDAE

***Calopteryx splendens* (Harris, 1782)**

Literature data: Tundzha River by the village of Zimnitsa, UTM LH91 (Beshovski 1964); Town of Stara Zagora, UTM LG89 (Nedelkov 1909, 2023); Tundzha River, after the town of Kalofer (by the railway station) after the entering of the town's waste waters, UTM LH31 (Rusev *et al.* 1984); Tundzha River above the Koprinka Dam, UTM LH51 (Rusev *et al.* 1984); Tundzha River below the Koprinka Dam, UTM LH61 (Rusev *et al.* 1984); Tundzha River 3 km S from the town of Kazanlak, UTM LH61 (Rusev *et al.* 1984); Tundzha River after the entering of Eninska River, UTM LH61, (Rusev *et al.* 1984); Tundzha River by the village of Zimnitsa, UTM LH91 (Rusev *et al.* 1984); Town of Banya below the Zhrebchevo reservoir, UTM MH11 (Rusev *et al.* 1984); Tundzha River by the town of Pavel Banya, UTM LH51 (Yaneva & Rusev 1985)); Tundzha River near Gurkovo, UTM MH02, (Mauersberger 1990).

New data: Near Banya Town, Stryama River, UTM LH21, 42.5415N, 24.8206E, 24.07.2019, 1 female (D. Bechev observation); Stryama River at the influx of Byala Reka River, UTM LH20, 42.5136N, 24.8455E, 13.06.2018 and 24.07.2019, male and female specimens (D. Bechev observation); Tundzha River before Zhrebchevo Dam, UTM MH02, 42.6372N, 25.8232E, 15.06.2018, male and female specimens (D. Bechev observation); West of Banya town, Stryama River, UTM LH21, 42.54277N, 24.81978E, 22.05.2019, 21 males and 10 females (D. Dimitrov observation); South of Gabarevo Village, Tundzha River, UTM LH41, 42.60844N, 25.14860E, 29.06.2019, 29 males and 13 females (D. Dimitrov observation); West of Banya town, Stryama River, UTM LH2, 42.541146N, 24.821214E, 01.06.2019, 30 males and 12 females (D. Dimitrov observation); Tundzha River before Koprinka Dam, UTM LH51, 42.608339N, 25.245617E, 08.07.2019, 4 males and 2 females (D. Dimitrov observation); Tundzha River to the bridge of Buzovgrad, UTM LH61, 42.594316N, 25.376120E, 16.7.2020, 9 males and 2 females (D. Dimitrov observation); Tundzha River near Rozovo vilige, UTM LH71, 42.575125N, 25.421014E, 03.08.2020, 10 males and 4 females (D. Dimitrov observation); Tundzha River west of Pavel Banya, UTM LH51, 42.603251N, 25.196234E, 21.08.2020, 2 females (D. Dimitrov observation).

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

Literature data: Tundzha River by the town of Pavel Banya, UTM LH51 (Beshovski 1964); Tundzha River by the town of Pavel Banya (Rusev *et al.* 1984); Tundzha River near Gurkovo, UTM MH02, (Mauersberger 1990).

New data: E of Beguntsi Village, Byala Reka River, UTM LH21, 42.547465N, 24.885341E, 20.05.2018, male and female specimens (D. Bechev observation); Stryama River at the influx of Byala Reka River, UTM LH20, 42.5136N, 24.8455E, 13.06.2018, male and female specimens (D. Bechev observation); S of Rozovets Village, Rahmanliyska River, UTM LH 40, 42.4462N, 25.0979E, 1.06.2019, 2 males (D. Bechev observation); Turiya Village, Turiyska River, UTM LH 51, 42.5732N, 25.1793E, 1.06.2019, 3 males (D. Bechev observation); South of Gabarevo Village, Tundzha River, UTM LH41, 42.60749N, 25.15598E, 29.06.2019, 11 males and 4 females (D. Dimitrov observation).

FAMILY COENAGRIONIDAE

Cercion lindenii (Selys, 1840)

Literature data: Tundzha River near Gurkovo, UTM MH02, (Mauersberger 1990).

Coenagrion ornatum (Selys, 1850)

Agrion ornatum Selys: Nedelkov (1923)

Coenagrion mercuriale: Rusev *et al.* (1984)

Literature data: Town of Kazanlak, UTM LH61 (Nedelkov 1923); Tundzha River below the Koprinka reservoir, UTM LH61 (Rusev *et al.* 1984).

Coenagrion puella (Linnaeus, 1758)

Agrion puella: Rusev *et al.* (1984)

Literature data: Town of Kazanlak, UTM LH61 (Nedelkov 1923); Town of Banya below the Zhrebchevo reservoir, UTM MH11 (Rusev *et al.* 1984); Tundzha River near Gurkovo, UTM MH02, (Mauersberger 1990).

Enallagma cyathigerum (Charpentier, 1840)

Literature data: Tundzha River near Gurkovo, UTM MH02, (Mauersberger,1990).

Erythromma viridulum (Charpentier, 1840)

Literature data: Tundzha River near Gurkovo, UTM MH02, (Mauersberger 1990).

New data: East of Gabarevo Village, small dam, UTM LH52, 42.624417N, 25.175030E, 09.08.2019, 1 male and 1 female (D. Dimitrov observation).

Ischnura elegans (Vander Linden, 1820)

Literature data: Tundzha River by the village of Zimnitsa, UTM LH91 (Yaneva & Rusev 1985); Tundzha River near Gurkovo, UTM MH02, (Mauersberger 1990).

New data: Old fish farm near Byala Reka River, near Bany Town, UTM LH20, 42.5154N, 24.8529E, 24.07.2019, 2 females (D. Bechev observation); South of Gabarevo Village, Tundzha River, UTM LH41, 42.60866N, 25.15146E, 29.06.2019, 4 males and 1 females (D. Dimitrov observation); Tundzha River before Koprinka Dam, UTM LH51, 42.610190N, 25.244808E, 08.07.2019, 2 males (D. Dimitrov observation); Tundzha River to the bridge of Buzovgrad, UTM LH61, 42.593303N, 25.377821E, 16.7.2020, 1 male and 1 female (D. Dimitrov observation).

Ischnura pumilio (Charpentier, 1825)

Literature data: Tundzha River near Gurkovo, UTM MH02, (Mauersberger 1990)

FAMILY LESTIDAE

Sympecma fusca (Vander Linden, 1820)

Literature data: Town of Stara Zagora, UTM LG89 (Nedelkov 1909); Tundzha River near Gurkovo, UTM MH02, (Mauersberger 1990).

FAMILY PLATYCNEMIDIDAE

Platycnemis pennipes (Pallas, 1771)

Literature data: Town of Stara Zagora, UTM LG89 (Nedelkov 1909); Town of Banya below the Zhrebchevo reservoir, UTM MH11 (Rusev *et al.* 1984); Tundzha River near Gurkovo, UTM MH02 (Mauersberger 1990).

New data: Near Banya Town, Stryama River, UTM LH21, 42.5415N, 24.8206E, 24.07.2019, 2 females (D. Bechev observation); Old fish farm near Byala Reka River, near Bany Town, UTM LH20, 42.5154N, 24.8529E, 24.07.2019, male and female in copula (D. Bechev observation); West of Banya town, Stryama River, UTM LH21, 42.54202N, 24.82029E, 22.05.2019, 3 males and 1 female (D. Dimitrov observation); South of Gabarevo Village, Tundzha River, UTM LH41, 42.608486N, 25.153516E, 29.06.2019, 51 specimens (D. Dimitrov observation); Tundzha River near Rozovo vilige, UTM LH71, 42.575653N, 25.425870E, 03.08.2020, 18 males and 6 females (D. Dimitrov observation); Tundzha River west of Pavel Banya, UTM LH51, 42.603268N, 25.195670E, 21.08.2020, 2 males (D. Dimitrov observation).

SUBORDER ANISOPTERA

FAMILY AESHNIDAE

Anax imperator Leach, 1815

Literature data: Tundzha River near Gurkovo, UTM MH02, (Mauersberger 1990).

New data: Old fish farm near Byala Reka River, near Bany Town, UTM LH20, 42.5154N, 24.8529E, 13.06.2018, 1 female in oviposition (D. Bechev observation).

FAMILY GOMPHIDAE

Gomphus flavipes (Charpentier, 1825)

Literature data: Tundzha River above the "Koprinka" Dam, UTM LH51 (Rusev *et al.* 1984).

Conservation status: Council Directive 92/43/EEC Anex IV.

Gomphus vulgatissimus (Linnaeus, 1758)

Literature data: Tundzha River by the town of Pavel Banya, UTM LH51 (Beshovski 1964); Tundzha River by the town of Pavel Banya, UTM LH51 (Rusev *et al.* 1984); Tundzha River above the Koprinka Dam, UTM LH51 (Rusev *et al.* 1984); town of Banya below the Zhrebchevo Dam, UTM MH11 (Rusev *et al.* 1984)**;** Tundzha River by the town of Pavel Banya, UTM LH51 (Yaneva & Rusev 1985).

Onychogomphus forcipatus (Linnaeus, 1758)

Literature data: Tundzha River by the town of Pavel Banya, UTM LH51 (Beshovski 1964); Tundzha River by the village of Zimnitsa, UTM LH91 (Beshovski 1964); Tundzha River after the entering of Eninska River, UTM LH61 (Rusev *et al.* 1984); Tundzha River by the village of Zimnitsa, UTM LH91 (Rusev *et al.* 1984); Tundzha River by the town of Pavel Banya, UTM LH51 (Yaneva & Rusev 1985); Tundzha River near Gurkovo, UTM MH02, (Mauersberger 1990).

***Ophiogomphus cecilia* (Fourcroy, 1785)**

Ophiogomphus serpentinus, Charpentier: Rusev *et al.* (1984).

Literature data: Tundzha River after Kalofer town (by the railway station) after the entering of the town's waste waters, UTM LH31 (Rusev *et al.* 1984); Tundzha River above the Koprinka Dam, UTM LH51 (Rusev *et al.* 1984).

Conservation status: Council Directive 92/43/EEC Anex II and IV; Bulgarian Biodiversity Conservation Act Anex II and III.

FAMILY LIBELLULIDAE

***Crocothemis erythraea* (Brullé, 1832)**

Literature data: Tundzha River near Gurkovo, UTM MH02, (Mauersberger 1990).

New data: Tundzha River before Koprinka Dam, UTM LH51, 42.608737N, 25.238546E, 08.07.2019, 1 males (D. Dimitrov observation); Tundzha River near Rozovo vilige, UTM LH71, 42.575703N, 25.426189E, 03.08.2020, 1 males (D. Dimitrov observation).

***Libellula depressa* (Linnaeus, 1758)**

Literature data: Tundzha River near Gurkovo, UTM MH02, (Mauersberger 1990).

New data: E of Beguntsi Village, Byala Reka River, UTM LH21, 42.547465N, 24.885341E, 20.05.2018, 1 male (D. Bechev observation); Turiya Village, Turiyska River, UTM LH 51, 42.5732N, 25.1793E, 1.06.2019, 1 male (D. Bechev observation); Pavel Banya, Tundzha River, UTM LH51, 42.6041N, 25.2048E, 1.06.2019, 2 males (D. Bechev observation).

***Orthethrum albistyllum* (Selys, 1848)**

Literature data: Tundzha River below the Koprinka Dam, UTM LH61 (Rusev *et al.* 1984); Tundzha River near Gurkovo, UTM MH02, (Mauersberger 1990).

New data: Old fish farm near Byala Reka River, near Bany Town, UTM LH20, 42.5154N, 24.8529E, 13.06.2018, 1 male, and 24.07.2019, 1 female (D. Bechev observation).

***Orthetrum brunneum (*Fonscolombe, 1837)**

Literature data: Tundzha River near Gurkovo, UTM MH02, (Mauersberger 1990).

New data: E of Beguntsi Village, Byala Reka River, UTM LH21, 42.547465N, 24.885341E, 20.05.2018, 1 male (D. Bechev observation); Tundzha River before Koprinka Dam, UTM LH51, 42.610979N, 25.243965E, 08.07.2019, 1 males (D. Dimitrov observation).

***Orthetrum cancellatum* (Linnaeus, 1758)**

Literature data: Tundzha River below the Koprinka Dam, UTM LH61 (Rusev *et al.* 1984); Tundzha River near Gurkovo, UTM MH02, (Mauersberger 1990).

New data: East of Gabarevo Village landed on sunflower, UTM LH52, 42.625539N, 25.170988E, 09.08.2019, 1 male (D. Dimitrov observation); Tundzha River to the bridge of Buzovgrad, UTM LH61, 42.593166N, 25.378231E, 16.7.2020, 1 female (D. Dimitrov observation); Tundzha River west of Pavel Banya, UTM LH51, 42.602879N, 25.192983E, 21.08.2020, 1 female (D. Dimitrov observation).

***Sympetrum depressiusculum* (Selys, 1841)**

Literature data: Tundzha River near Gurkovo, UTM MH02, (Mauersberger 1990).

Conservation status: European Red List (VU).

***Sympetrum fonscolombii* (SELYS, 1840)**

Literature data: Tundzha River near Gurkovo, UTM MH02, (Mauersberger 1990).

New data: Tundzha River to the bridge of Buzovgrad, UTM LH61, 42.574276N, 25.414394E, 3.8.2020, 1 male (D. Dimitrov observation).

***Sympetrum meridionale* (Selys, 1841)**

Literature data: Town of Banya below the Zhrebchevo Dam, UTM LH61 (Rusev *et al.* 1984); Tundzha River near Gurkovo, UTM MH02, (Mauersberger 1990).

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

Literature data: Tundzha River near Gurkovo, UTM MH02, (Mauersberger 1990).

New data: East of Gabarevo Village near a small dam, UTM LH52, 42.624617N, 25.173182E 09.08.2019, 1 male (D. Dimitrov observation).

***Sympetrum striolatum* (Charpentier, 1840)**

New data: South of Gabarevo Village, Tundzha River, UTM LH41, 42.60866N, 25.15146E, 29.06.2019, 1 female (D. Dimitrov observation); Tundzha River before Koprinka Dam, UTM LH51, 42.614314N, 25.246172E, 08.07.2019, 1 female (D. Dimitrov observation).

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Fauna of Sarnena Sredna Gora Mts, Part 1
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Faunistic study on the earthworms (Annelida: Oligochaeta: Lumbricidae) from the Sarnena Sredna Gora Mts

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Abstract. A total of 381 specimens belonging to 17 earthworm species were collected with 152 pitfall traps in 26 sampling sites during a study of the biodiversity of the Sarnena Sredna Gora Mts. Together with the previous available data this constitutes 42% (21 species) of the lumbricid fauna of Bulgaria. Ten species represent new records for the explored territory. The data on the biotopic distribution and relative abundance of the identified earthworm species were provided for the first time and give valuable information on the species composition of the lumbricids, their specific preferences for environmental conditions, and the conservation value of the studied habitats. The material was collected by a non-traditional method – pitfall traps, a method not applied before for the target group. A comparative analysis of the established earthworms of Sarnena Gora with those from the neighboring regions was done. It showed the importance of the geographical location, relief, climate, soil type and human factor in the formation of the lumbricid fauna.

Key words: lumbricids, Sarnena Gora, check list, new records.

Introduction

Earthworm fauna in Bulgaria includes 50 species, belonging to 15 genera and 2 families (Valchovski 2012). The extent of study in various parts of the country is very different and some mountains have been studied more intensively – Vitosha Mts (Černosvitov 1937), Rila Mts (Valchovski 2016), Pirin Mts (Černosvitov 1934), western parts of the Stara Planina Mts (Šapkarev 1986, Stojanović *et al.* 2012), Sredna Gora Mts (Valchovski & Velizarova 2016), Strandzha Mts (Mihailova 1968), as well as the Sofia Plain (Valchovski 2014) and Upper Thracian Lowland (Michailova 1966, Zicsi & Csuzdi 1986, Valchovski & Szederjesi 2016). The soil mesofauna of large parts from the country have never been a subject of study – especially in the cultivated lands, as well as areas considered to have high anthropogenic impact and areas with low conservation value.

The biodiversity in Sarnena Sredna Gora Mts hasn't been studied on purpose probably due to the prevalence of agricultural lands in the lower regions of the mountain or the absence of Protected Areas. The geographical location, relief, edaphic conditions and specific climatic factors in the mountain are the prerequisite of complex and rich fauna including typical cold-tolerant mountain species and thermophilic xerobiont species, related

to the Transitional Mediterranean Climate, the proximity to the Black Sea and the valleys of the rivers from the Aegean Sea Watershed.

Previous data for the studied territory include a total of 11 earthworm species from different foothill areas (Michailova 1966, Uzunov 2010, Valchovski & Szederjesi 2016). The materials have been collected once or accidentally and don't include the higher parts of the mountain or some specific and characteristic for Sarnena Gora Mts habitats.

The aim of the present paper was to summarize the new data and the previous records on the earthworm fauna in the Sarnena Gora Mts, as well as to study the patterns in their distribution by the habitat types, altitude and seasons. The material was collected with a non-traditional for the earthworms method.

Material and Methods

The species list was completed on the basis of the material collected during field trips and the available bibliographic data. Field work was carried out in the period of 2018 – 2020. Earthworms were collected with 152 pitfall traps. The pitfall traps were of two types: small (made of 500 ml beakers, with salt-vinegar solution as a fixative) and big (cut plastic bottles with 2 l volume and diameter of the enter hole about 12 cm, with 4-10% formaldehyde as a fixative), buried at the level of the substrate. Small traps were used only in 2018 when the material near Zelenikovo vill. was collected from four sampling sites (sites 23, 24, 25, and 26 in Table 1), with 5 traps in each site. Sampling periods were: 19.IV–15.V [1], 15.V–11.VI [2] and 26.VII–25.VIII.2018 [3]. Big traps were used in 2019 – 2020 from the other sampling sites (sites 1-22 in Table 1), with 6 traps in each site. Sampling periods were: III-VII.2019 [1], VII-XI.2019 [2] and XI.2019-IV.2020 [3].

The sampling sites were situated in 3 separate parts of Sarnena Sredna Gora Mts – Svezhen Region, Bratan Region and Chirpan Heights Region (Figure 1, Table 1). The pitfall traps were placed in different habitats with different exposition, altitude and soil type throughout the Sarnena Sredna Gora Mts. The material was collected seasonally, and the three sampling periods were called: [1] – spring-summer, [2] – summer-autumn and [3] – autumn-spring.

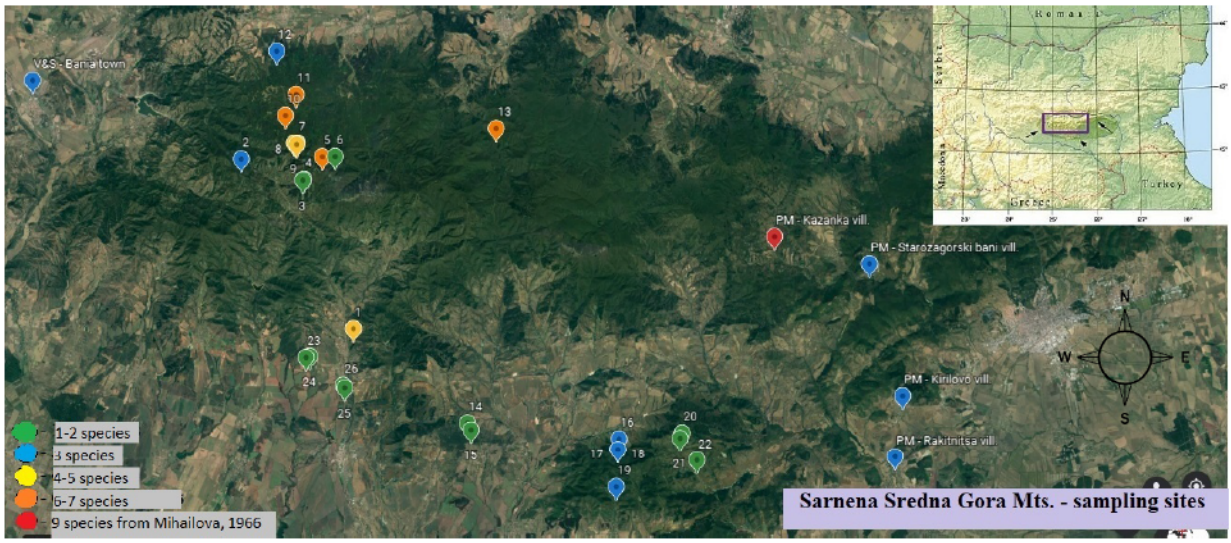

Fig. 1. Map of the locations of the main sampling sites. Different colours of the sites reflect the number of collected species. Abbreviations: 1 – 26 are the sampling sites from our research (see Table 1); PM – sampling sites from Mihailova (1966); VS – sampling sites from Valchovski & Szederjesi (2016).

Pitfall trapping is one of the oldest and most frequently used methods for faunistic and ecological studies of invertebrates and small terrestrial mammals. Here it was used experimentally in earthworm research for the first time. Disadvantage of the method is that it is missing many of the anecic and large endogeic speimens. The suitability of the method for collecting of earthworms will be analyzed in a future study.

The collected material was rinsed thoroughly with water and transferred into 70% ethanol. Adult specimens were identified at species level, juveniles – at generic level.

For the identification of the material collected, keys and tables made from differen authors for other foreign territories (Chekanovskaia 1960, Perel 1979, Vsevolodova-Perel 1997, Mrsic 1991, Csuzdi & Zicsi 2003, Reynolds & Mısırlıoğlu 2018) were used. Main diagnostic characteristics are the prostomium type, body length, arrangement of setae, position of clitellum and tubercula pubertatis, etc.

The ecological groups of the earthworms we used were based on the research of Perel (1979) in which the author describes the position of every species in the soils.

All specimens were deposited in earthworm collection in University of Forestry, Sofia.

During preparation of the compiling list of the region we used generally accepted and up-to-date systematics of the group (Blakemore 2006, Szederjesi 2017, Reynolds & Wetzel 2019), as well as the checklist of earthworms from Bulgaria (Valchovski 2012). For the distribution of the species we used Internet sources such as: Drilobase Project (2013) and Fauna Europaea (Rota 2015).

Table 1. List of the sampling sites from Sarnena Sredna Gora Mts, with their average altitude (a.s.l.), coordinates (GPS) and descriptions of their habitat and soils. WRB – soil type according to World Reference Base for Soil Resources (IUSS Working Group 2015).

№	GPS	a.s.l.	Locality and habitat	Soil description	WRB
1	42°24'46''N 25°05'13''E	344 m	Bratan Region: E Zelenikovo vill. Old mesophile, Scots pine (*Pinus sylvestris*) and Linden (*Tilla sp.*) plantation near walnut garden and a river.	Moist to over-moistened, of alluvial type with a lot of rotting organic matter and dry deadwood on the surface.	Chromic Luvisol
2	42°30'31''N 24°59'59''E	860 m	Svezhen Region: W Svezhen vill. on the road to Hadzhi Dimitar's Grave Place. Old mesoxerothermic oak forest (*Quercus sp.)* near many little meadows.	Well drained and moderately moist, with thick cover of leaf litter and deadwood.	Chromic Cambisol
3	42°29'48''N 25°02'54''E	865 m	Svezhen Region: E Svezhen vill. on the road to Hut Svezhen. Actively grazed ridge pasture with single trees and bushes of oak (*Quercus sp.*), rosehip (*Rosa canina*) and birch (*Betula pendula*).	Clay meadow soil, with characteristic summer droughts.	Chromic Cambisol
4	42°29'50''N 25°02'57''E	863 m	Svezhen Region: E Svezhen vill. on the road to Hut Svezhen. Old coniferous Scots pine and Norway spruce (*Picea abies*) plantation bordering a pasture.	Thick and moist clay soil, rich in organic matter and dry deadwood on the surface.	Chromic Cambisol
5	42°30'35''N 25°03'51''E	1100 m	Svezhen Region: E Hut Svezhen. Old ridge beech forest (*Fagus sp.*) with many old trees.	Moderately moist, crumbly, rich in organic matter and dry deadwood on the surface, with a thick leaf litter.	Histic Cambisol

6	42°30'36''N 25°04'26''E	975 m	Svezhen Region: E Hut Svezhen. Old ridge beech forest with many old trees.	Silt, crumbly, prone to summer droughts, despite the thick leaf litter and the deadwood on the surface.	Histic Cambisol
7	42°31'03''N 25°02'40''E	1022 m	Svezhen Region: NW Hut Svezhen. Old ridge beech forest on the northern slope with many old trees.	Thick, crumbly, rich in rotting organic matter and dry deadwood on the surface.	Histic Cambisol
8	42°30'60''N 25°02'38''E	1015 m	Svezhen Region: NW Hut Svezhen. Old coniferous plantation of Scots pine, Spruce and Douglas-fir (*Pseudotsuga menziensii*) on the northern slope, with single trees of beech, overgrown by eagle fern (*Pteridium aquilinum*).	Sandy, shallow, with a surface organic from rotting dead leaves.	Cambic Leptosol
9	42°31'03''N 25°02'31''E	1008 m	Svezhen Region: NW Hut Svezhen. Actively grazed ridge pasture with single trees and bushes.	Clay soil of pasture-meadow type.	Cambic Umbrisol
10	42°31'59''N 25°02'05''E	898 m	Svezhen Region: NW Hut Svezhen. Mesophile mixed forest of beech, oak and hornbeam (*Carpinus orientalis*), at the upper limit of the oak and the lower limit of the beech.	Moderately moist, rich in rotting organics, leaf litter and deadwood on the surface.	Histic Cambisol
11	42°32'43''N 25°02'32''E	670 m	Svezhen Region: S Osetenovo vill. River bank near actively used pasture with single old trees and bushes.	Alluvial, with big surface stones and rich in fecal organics from the grazing animals.	Skeletic Fluvisols
12	42°34'12''N 25°01'36''E	633 m	Svezhen Region: S Osetenovo vill. Mesoxerophile oak forest with numbers of large tufts of butcher's-broom (*Ruscus aculeatus*) near active pasture with single trees.	Crumbly, trampled, with thin leaf litter and rich in fecal organic matter.	Histic Cambisol
13	42°31'35''N 25°11'59''E	583 m	Bratan Region: S Turiya vill. Riverine forest at the lower limit of the beech, with alder (*Alnus sp.*), hazel (*Corylus avellana*), hornbeam and meso-hygrophile plants.	Moist or flooded near the river bank, with a thick surface layer of rotting plants and wood.	Skeletic Fluvisols
14	42°21'33''N 25°10'37''E	366 m	Chirpan Heights Region: NW Veren vill. Ridge Black locust (*Robinia pseudoacacia*) plantation with heliophile plants.	Coarse sandy soil, degraded and well-drained.	Chromic Luvisol
15	42°21'19''N 25°10'47''E	353 m	Chirpan Heights Region: NW Veren vill. Pasture with many bushes and tufts of cactus (*Opuntia sp.*) bordering with the village.	Silt, thickened by the grazing animals and covered with xerophilous plants.	Chromic Luvisol
16	42°21'01''N 25°17'47''E	386 m	Chirpan Heights Region: S Saedinenie vill. Meso-hygrophile rivarine mixed forest with wild vine (*Parthhenocissus quinquefolia*), ivy (*Hedera helix*) and elm (*Ulmus sp.*).	Partly flooded (in the gully), rich in rotting organics.	Colluvic Regosol
17	42°20'39''N	487 m	Chirpan Heights Region: S Saedinenie	Moderately moist, light, rich in	Chromic

	25°17'44''E		vill. Old linden forest on the northern slope with tufts of bitcher's-broom.	rotting plant litter and surface organic matter. During the summer, the surface layer dries and hardens.	Luvisol
18	42°20'44''N 25°17'41''E	449 m	Chirpan Heights Region: S Saedinenie. Mixed forest of oak, linden, maple (Acer sp.) with butcher's-broom, *Viburnum sp.* and ivy.	Thick and moist, rich in organic matter, with piles of stones in some places, due to erosion on the steep slope.	Colluvic Regosol
19	42°19'21''N 25°17'39''E	418 m	Chirpan Heights Region: N Sredno Gradishte vill. Xerophile forest of oak and hornbeam with Jerusalem thorn (*Parkinsonia aculeata*), cornel (*Cornus mas*), hawthorn (*Crataegus sp.*) and butcher's-broom.	Shallow and stony.	Skeletic Leptosol
20	42°21'13''N 25°20'46''E	435 m	Chirpan Heights Region: NW Stoyan Zaimovo vill. Abandoned pasture with single bushes and trees – pear (*Pyrus sp.*), apple (*Malus sp.*), cherry plum (*Prunus cerasifera*), oaks, blackthorn and blackberry.	Degraded, coarse sandy soil with many large surface stones.	Skeletic Leptosol
21	42°21'02''N 25°20'40''E	406 m	Chirpan Heights Region: NW Stoyan Zaimovo vill. Alfalfa field bordering with belt of bushes and trees. The pitfall traps are placed on the edge of the ecotone zone.	Degraded, sandy clay, poor in nutrients, due to the condition of the alfalfa field.	Chromic Luvisol
22	42°20'16''N 25°21'28''E	363 m	Chirpan Heights Region: NW Stoyan Zaimovo vill. Wheat field bordering with river bank. Ecotone zone with walnut (*Juglans regia*) plantation and ruderal plants.	Alluvial, with a thick cover of rotting dead grasses.	Colluvic Regosol
23	42°23'47''N 25°02'57''E	280 m	Bratan Region: W Zelenikovo vill. Rapeseed field. Perennial exploited, severely degraded agricultural land, a consequence of the repeated, annual destruction of the soil structure, the application of mineral fertilizers and plant protection products.	Moderately leached cinnamon, moderately eroded, sandy clay, hardening during droughts.	Chromic Luvisol
24	42°22'45''N 25°04'48''E	288 m	Bratan Region: S Zelenikovo vill. Rapeseed field.	Moderately leached cinnamon, moderately eroded, silty clay.	Chromic Luvisol
25	42°23'49''N 25°03'09''E	290 m	Bratan Region: W Zelenikovo vill. Lightely used pasture located in an agricultural landscape with mainly xerophile plants and tufts of nitrophile ruderal plants.	Moderately leached cinnamon, moderately eroded, sandy clay, with a hard surface layer due to the grazing animals. In summer, the grass dries out and the soil becomes even denser, harder and dustier.	Chromic Luvisol
26	42°22'50''N 25°04'43''E	290 m	Bratan Region: S Zelenikovo vill. Moderately grazed pasture located in an agricultural landscape.	Moderately leached cinnamon, not eroded, light clay.	Chromic Luvisol

Results and Discussion

Material collected during the present study included 381 specimens, and from 264 of them we determined 17 species from 8 genera. Not identified during our study but published for the area (Michailova 1966) were: *Allobophora chlorotica, Aporrectodea caliginosa, A. trapezoides, Eiseniella tetraedra*. A total of 21 earthworm species belonging to 9 genera was found in Sarnena Sredna Gora Mts (Appendix). This represents 42% of all established for Bulgarian lumbricid species and 60% of the genera, respectively. Ten earthworm species were new geographical records of the explored area. They are marked with asterisk (*) in the Species list below.

Species list

1. *Allolobophora chlorotica* (Savigny, 1826)
Ecological group: Endogeic.
Distribution: Cosmopolite peregrine species – peregrine type (here and further in the text we use "peregrine", as initially used by Michaelsen (1903) and Perel (1979). Europe, Western Siberia, Asia Minor, North America, North Africa, South America, New Zealand. Rapidly dispersing hygrophile.
Habitat: Wet, highly organic sites near river banks and in cultivated soils (Mihailova 1966).
Distribution in Bulgaria: Iskar River, Sofia Plain (Plisko 1963, Valchovski 2014), Thracian Lowland (Mihailova 1966, Šapkarev 1986), SW Bulgaria (Šapkarev 1986, Stojanović *et al.* 2012).
Distribution in Sarnena Sredna Gora: Starozagorski Bani vill., Kazanka vill. (Mihailova 1966).

2. **Allolobophora leoni* (Michaelsen, 1891)
Ecological group: Endogeic.
Distribution: Central Europe and the eastern shore of the Black Sea.
Habitat: We found it in actively grazed pastures with single bushes and trees.
Distribution in Bulgaria: NW Bulgaria (Mihailova 1965).
Distribution in Sarnena Sredna Gora: This is the first record of this species here.
New material: site 3: 1ex. [1].

3. *Aporrectodea caliginosa* (Savigny, 1826)
Ecological group: Endogeic.
Distribution: Cosmopolite – peregrine type.
Habitat: Meadows (Mihailova 1966).
Distribution in Bulgaria: Iskar River, Sofia Plain (Plisko 1963, Šapkarev 1986, Valchovski 2014), Thracian Lowland (Mihailova 1966, Šapkarev 1986, Valchovski & Szederjesi 2016), SW Bulgaria (Plisko 1963, Stojanović et al. 2012), Rila Mts (Valchovski 2016a), Sredna Gora Mts (Valchovski & Velizarova 2016), Vitosha Mts (Stojanović et al. 2012) Danube Lowland (Uzunov 2010, Valchovski & Szederjesi 2016).
Distribution in Sarnena Sredna Gora: Kazanka vill., Starozagorski bani vill., Chirpan (Mihailova 1966).

4. **Aporrectodea handlirschi* (Rosa, 1897)
Ecological group: Endogeic.
Distribution: Central, Southern and Southeastern Europe, including Crimea and the Northwest Caucasus and European Turkey.
Habitat: We found it in oak forest, pasture and river bank.

Distribution in Bulgaria: Vitosha Mts (Černosvitov 1937, Šapkarev 1986), Belasitca Mts (Plisko 1963, Šapkarev 1986), SW Bulgaria (Valchovski 2016b), Sofia Plain (Šapkarev 1986) and Eastern part of Rhodope Mts (Mihailova 1966).
Distribution in Sarnena Sredna Gora: This is the first record of this species here.
New material: site 2: 1ex. [3]; site 9: 2ex. [3]; site 11: 1ex. [1].

5. *Aporrectodea jassyensis* (Michaelsen, 1891)
Ecological group: Endogeic.
Distribution: Widely distributed Western Palaearctic (Trans-Aegean) species.
Habitat: Meadows and cultivated soils (Mihailova 1966). We found it in a pasture.
Distribution in Bulgaria: Sofia Plain (Plisko 1963, Šapkarev 1986, Valchovski 2014), Vitosha Mts (Stojanović et al. 2012), Thracian Lowland (Mihailova 1966, Šapkarev 1986, Valchovski & Szederjesi 2016), SW Bulgaria (Šapkarev 1986), Rila Mts (Valchovski & Misirlioglu 2017) and Rhodope Mts (Mihailova 1966, Szederjesi 2013).
Distribution in Sarnena Sredna Gora: Starozagorski bani vill., Chirpan (Mihailova 1966); beside Striama River near Bania town (Valchovski & Szederjesi 2016)
New material: site 9: 1ex. [2].

6. *Aporrectodea longa* (Ude, 1885)
Ecological group: Anecic.
Distribution: Cosmopolite – peregrine type. Europe, Asia Minor, North America, North Africa, New Zealand synanthropized, invasive outside its natural range.
Habitat: Pastures, cultivated soils, forest (Mihailova 1966). We found it in ridge beech forest with old trees.
Distribution in Bulgaria: Konyavska Mt (Černosvitov 1937), Thracian Lowland, Sredna Gora Mts (Mihailova 1966) and Sofia Plain (Valchovski 2014), SW Bulgaria (Valchovski 2016b).
Distribution in Sarnena Sredna Gora: Kazanka vill., Starozagorski bani vill., Chirpan (Mihailova 1966).
New material: site 5: 7ex. [1].

7. *Aporrectodea rosea* (Savigny, 1826)
Ecological group: Endogeic.
Distribution: Cosmopolite – peregrine type. Europe, Asia, North America, North Africa, South America. Parthenogenetic synanthropic polyploid. Synanthropized, invasive, polymorphic.
Habitat: We found it in mixed forest and river bank.
Distribution in Bulgaria: Sofia Plain (Černosvitov 1937, Plisko 1963, Stojanović et al. 2012, Valchovski 2014), Thracian Lowland (Mihailova 1964, 1966, Šapkarev 1986, Valchovski & Szederjesi 2016), Stara Planina Mts (Rosa 1897, Plisko 1963, Šapkarev 1986), Rila Mts (Šapkarev 1986, Valchovski 2016a), Vitosha Mts (Stojanović et al. 2012), Rhodope Mts (Mihailova 1966), Lyulin Mts (Plisko 1963), Sredna Gora Mts (Valchovski & Velizarova 2016), SW Bulgaria (Černosvitov 1937 Plisko 1963, Šapkarev 1986, Valchovski 2016b), Danubian Plain (Černosvitov 1937, Šapkarev 1986, Uzunov 2010).
Distribution in Sarnena Sredna Gora: Kazanka vill. (Mihailova 1966); beside Striama River near Bania town (Valchovski & Szederjesi 2016).
New material: site 10: 1ex. [1]; site 11: 1ex. [1]. Most common earthworm species in Bulgaria, but low count in the explored area.

8. *Aporrectodea trapezoides* (Dugès, 1828)
Ecological group: Endogeic.
Distribution: Cosmopolite – peregrine type. Europe, Asia, North America, Africa, South America and New Zealand.
Habitat: Wet sites near cultivated soils and river banks (Mihailova 1966).
Distribution in Bulgaria: Thracian Lowland (Mihailova 1966, Šapkarev 1986), Sofia Plain (Šapkarev 1986, Valchovski 2014), SW Bulgaria (Šapkarev 1986, Stojanović et al. 2012), Vitosha Mts (Stojanović et al. 2012) Danubian Plain, Ludogorie Region, Rila Mts (Šapkarev 1986, Valchovski 2016a).
Distribution in Sarnena Sredna Gora: Kazanka vill, Chirpan, Starozagorski bani vill. (Mihailova 1966).

9. **Bimastos rubidus* (Savigny, 1826)
Ecological group: Epigeic.
Distribution: Cosmopolite – synanthropic type. Distributed in Europe, Asia, Africa, North America, invasive in South America, New Zealand. Synanthropic invasive peregrine species of North American origin.
Habitat: we found it in ridge beech forest with old trees, coniferous plantation and riverine forest.
Distribution in Bulgaria: Thracian Lowland (Mihailova 1966, Valchovski & Szederjesi 2016), Western Rhodope Mts (Černosvitov 1934, Mihailova 1966), NW Bulgaria, Eastern Stara Planina Mts (Černosvitov 1934, Šapkarev 1986), Vitosha Mts (Plisko 1963, Šapkarev 1986), Belasitca Mts (Černosvitov 1934), Sredna Groa Mts (Valchovski & Velizarova 2016), Rila Mts (Plisko 1963, Šapkarev 1986, Zicsi & Csuzdi 1986, Valchovski 2016a).
Distribution in Sarnena Sredna Gora: This is the first record of this species here.
New material: site 5: 1ex. [3]; site 7: 1ex. [3]; site 1: 2ex. [2]; site 13: 1ex. [1].

10. **Bimastos eiseni* (Levinsen, 1884)
Ecological group: N/A.
Distribution: Cosmopolite – peregrine type. Distributed in Europe, Asia, Africa, North America, synanthropic in New Zealand.
Habitat: We found it in riparian forest, mixed forest, ridge beech forest with old trees and coniferous forest.
Distribution in Bulgaria: Stara planina Mts (Černosvitov 1937), Vitosha Mts (Plisko 1963), East Rhodope Mts (Mihailova 1966), Rila Mts (Valchovski & Szederjesi 2016).
Distribution in Sarnena Sredna Gora: This is the first record of this species here.
New material: site 5: 1ex. [2]; site 8: 1ex. [2]; site 10: 2ex. [1; 3]; site 16: 1ex. [3].

11. **Cernosvitovia rebeli* (Rosa, 1897)
Ecological group: Endogeic.
Distribution: Balkan endemic. Romania, Bulgaria, Greece, Albania
Habitat: We found it in mixed forest (old beech and linden forest), pastures and foot hills.
Distribution in Bulgaria: Stara Planina Mts (Rosa 1897, Černosvitov 1934, Valchovski 2016c), Strandzha Mts (Černosvitov 1937, Szederjesi 2013), Western Rhodope Mts (Mihailova 1966), Sredna Gora Mts (Valchovski & Velizarova 2016), Gorata Mt (part of Eastern Rhodope Mts) (Szederjesi 2013).
Distribution in Sarnena Sredna Gora: This is the first record of this species here.
New material: site 5: 3ex. [1; 3]; site 9: 1ex. [2]; site 10: 1ex. [1]; site 17: 6ex. [1]; site 18: 1ex. [1].

12. ****Dendrobaena alpina* **(Rosa, 1884)
Ecological group: Epigeic.
Distribution: Central, southern and southeastern Europe, Asia Minor, Alpes, the Balkans and the southern Carpathians and the Lesser Caucasus. Mountain species.
Habitat: We found it in coniferous forest, beech forest, oak forest and pasture (580 – 1000 m).
Distribution in Bulgaria: Vitosha Mts (Černosvitov 1937, Šapkarev 1986) Western Rhodope Mts (Černosvitov 1937, Mihailova 1966, Szederjesi 2013), Eastern Rhodope Mts (Mihailova 1966), Sredna Gora Mts (Valchovski & Velizarova 2016), Pirin Mts (Uzunov 2010), Rila Mts (Šapkarev 1986, Zicsi & Csuzdi 1986, Uzunov 2010, Valchovski 2016a), Sakar Mts (Mihailova 1966).
Distribution in Sarnena Sredna Gora: This is the first record of this species here.
New material: site 2: 1ex. [1]; site 4: 1ex. [3]; site 8: 3ex. [3]; site 6: 4 ex. [1; 3]; site 7: 4ex. [1; 2; 3]; site 9: 4ex. [1; 3]; site 10: 2ex. [1]; site 13: 1ex. [1];.

13. ****Dendrobaena balcanica* **(Černosvitov, 1937)
Ecological group: Epigeic.
Distribution: Balkan endemic. Bulgaria, Greece.
Habitat: We found it in old beech forest and coniferous forest in mountains (1100m).
Distribution in Bulgaria: Ali-Botush Mts (Černosvitov 1937) and Pirin Mts (Zicsi & Csuzdi 1986).
Distribution in Sarnena Sredna Gora: This is the first record of this species here.
New material: site 5: 3ex. [1]; site 8: 1ex. [1].

14. ***Dendrobaena hortensis*** **(Michaelsen, 1890)**
Ecological group: Epigeic.
Distribution: Cosmopolite – peregrine type. With a spotted distribution, in many places synanthropized. Palearctic, North and South America, South Africa.
Habitat: Near river banks (Mihailova 1966). We found it in mixed forest.
Distribution in Bulgaria: Sredna Gora Mts (Mihailova 1966) and Strandzha Mts (Szederjesi 2013).
Distribution in Sarnena Sredna Gora: Starozagorski bani vill. (Mihailova 1966).
New material: site 1: 1ex. [3]; site 10: 3ex. [2]; site 11: 1ex. [3].

15. ****Dendrobaena octaedra* **(Savigny, 1826)
Ecological group: Epigeic.
Distribution: Cosmopolite – peregrine type. Europe, North America, Asia, South America.
Habitat: We found it in wet sites and beech forest near river.
Distribution in Bulgaria: Rila Mts (Plisko 1963, Šapkarev 1986, Zicsi & Csuzdi 1986, Uzunov 2010, Stojanović et al. 2012), Stara Planina Mts (Plisko 1963), Lyulin Mts, Vitosha Mts (Plisko 1963, Šapkarev 1986), Sofia Plain, Osogovska Planina Mts (Šapkarev 1986), Central and Eastern part of Rhodope Mts (Uzunov 2010, Szederjesi 2013).
Distribution in Sarnena Sredna Gora: This is the first record of this species here.
New material: site 11: 1ex. [2]; site 13: 6ex. [2].

16. ****Eisenia fetida* **(Savigny, 1826)
Ecological group: Epigeic.
Distribution: Cosmopolite peregrine species – synanthropic type. The species has an invasive expansion due to its great ecological flexibility outside its natural range. Distributed in Europe, Asia, North America, North Africa, native to South America and New Zealand.
Habitat: We found it in agricultural land, mixed forest (beech and oak) and wet sites.

Distribution in Bulgaria: Eastern Stara Planina Mts (Rosa 1897), Thracian Lowland (Mihailova 1966, Šapkarev 1986, Valchovski & Szederjesi 2016), Rila Mts (Šapkarev 1986), Sofia Plain (Šapkarev 1986, Valchovski 2014), Pirin Mts (Stojanović et al. 2012).
Distribution in Sarnena Sredna Gora: This is the first record of this species here.
New material: site 5: 2ex. [1; 3]; site 7: 1ex. [3]; site 11: 1ex. [3]; site 12: 1ex. [1]; site 18: 1ex. [1]; site 19: 1ex. [1]; site 22: 1ex. [3].

17. *Eisenia lucens* (Waga, 1857)
Ecological group: Epigeic.
Distribution: From the Pyrenees through the Alps and the Carpathians to Macedonia and Bulgaria (central and southeastern Europe), relocated to Brazil (South America).
Habitat: Under bark of fallen logs near river (Valchovski & Szederjesi 2016). We found it in beech forest near river.
Distribution in Bulgaria: Belasitca Mts (Černosvitov 1934), Osogovo Mts, Rhodope Mts (Černosvitov 1937, Szederjesi 2013), Danubian Plain (Černosvitov 1937, Šapkarev 1986), Western Stara Planina Mts (Černosvitov 1937, Plisko 1963, Szederjesi 2013), Central Stara Planina Mts (Černosvitov 1934, Plisko 1963, Šapkarev 1986), Eastern Stara Planina Mts (Šapkarev 1986, Szederjesi 2013), Sredna Gora Mts (Valchovski & Szederjesi 2016), Rila Mts (Šapkarev 1986), Thracian Lowland (Mihailova 1964), Strandzha Mts (Plisko 1963, Szederjesi 2013), Sofia Plain (Valchovski 2014).
Distribution in Sarnena Sredna Gora: Beside Striama River near Bania town (Valchovski & Szederjesi, 2016).
New material: site 13: 1ex. [1].

18. *Eiseniella tetraedra* (Savigny, 1826)
Ecological group: Amphibiotic epigeic.
Distribution: Cosmopolite – synanthropic type. Europe, Asia, North America, North Africa, invasive in South America and New Zealand). Parthenogenetic, polyploid, amphibiotic and synanthropized invasive species.
Habitat: Lilac forest and near wet sites (Mihailova 1966); river bank (Valchovski & Szederjesi 2016).
Distribution in Bulgaria: Rila Mts (Černosvitov 1934, Zicsi & Csuzdi 1986, Šapkarev 1986), Rhodope Mts (Černosvitov 1934), Vitosha Mts (Černosvitov 1937, Šapkarev 1986, Stojanović et al. 2012), Lyulin Mts, Slavianka Mts, Pirin Mts (Černosvitov 1937), Danubian Plain (Šapkarev 1986, Uzunov 2010), Western and Central Stara Planina Mts, Belasitca Mts (Plisko 1963), Sofia Plain (Plisko 1963, Šapkarev 1986, Valchovski 2014), Sredna Gora Mts, Thracian Lowland (Mihailova 1966, Šapkarev 1986, Uzunov 2010, Valchovski & Szederjesi 2016), Strandzha Mts (Uzunov 2010, Szederjesi 2013).
Distribution in Sarnena Sredna Gora: Kazanka vill. (Mihailova 1966); Sarnena Sredna Gora (Uzunov 2010); beside Striama River near Bania town (Valchovski & Szederjesi 2016).

19. *Lumbricus rubellus* Hoffmeister, 1843
Ecological group: Epi-endogeic.
Distribution: Cosmopolite – peregrine and synanthropic type. Transported to many places around the world and cultivated for the purposes of composting household organic matter, and in other places it has become invasive.
Habitat: Oak forest and near wet sites (Mihailova 1966). We found it in mixed forest (old beech and oak), pasture and near river banks.
Distribution in Bulgaria: Belasitsa Mts, Strandzha Mts (Černosvitov 1934), Vitosha Mts, Western Stara Planina Mts (Černosvitov 1937, Plisko 1963), Central Stara Planina Mts (Rosa 1897, Černosvitov 1934, Plisko 1963), Rila Mts (Černosvitov 1937, Šapkarev 1986, Zicsi &

Csuzdi 1986, Uzunov 2010), Osogovska Planina Mts, Rhodope Mts (Černosvitov 1937, Mihailova 1966), Sredna Gora Mts (Šapkarev 1986, Uzunov 2010, Valchovski & Velizarova 2016), Danubian Plain (Šapkarev 1986, Uzunov 2010), Ludogorie Region (Šapkarev 1986), Thracian Lowland (Mihailova 1966, Šapkarev 1986, Uzunov 2010), Gorata Mt, Sakar Mts (Mihailova 1966), Pirin Mts (Stojanović et al. 2012), SW Bulgaria (Valchovski 2016b), Sofia Plain (Plisko 1963, Šapkarev 1986, Valchovski 2014).

Distribution in Sarnena Sredna Gora: Starozagorski bani vill., Kazanka vill. (Mihailova 1966).

New material: site 3: 2ex. [1; 3]; site 7: 1ex. [2]; site 9: 2ex. [1; 3]; site 10: 5ex. [1; 2]; site 11: 4ex. [1; 3]; site 12: 1ex. [1]; site 13: 2ex. [1]; site 14: 5ex. [2; 3]; site 15: 8ex. [1]; site 17: 1ex. [3]; site 18: 5ex. [1; 2; 3]; site 19: 5ex. [1]; site 23: 2ex. [2]; site 25: 4ex. [1; 2]; site 26: 17ex. [1; 2].

20. ****Lumbricus terrestris* **Linnaeus, 1758

Ecological group: Anecic.

Distribution: Cosmopolite – peregrine and synanthropic type. Synanthropized and accidentally introduced in many parts of the world.

Habitats: We found it in pine forest and near river banks.

Distribution in Bulgaria: Sofia Plain (Plisko 1963, Šapkarev 1986, Valchovski 2011, 2014, Stojanović et al. 2012, Valchovski & Szederjesi 2016), Lyulin Mts (Plisko 1963), Eastern (Šapkarev 1986) and Central Stara Planina Mts (Teofilova 2016), Rila Mts (Zicsi & Csuzdi 1986, Szederjesi 2013, Valchovski 2016a), Central Rhodope Mts (Szederjesi 2013), Pirin Mts (Valchovski 2016b), Lower valley of the River of Tundzha (Teofilova 2017), Sredna Gora Mts (Valchovski & Velizarova 2016).

Distribution in Sarnena Sredna Gora: This is the first record of this species here.

New material: site 1: 1ex. [1]; site 11: 1ex. [2].

21. *Octolasion lacteum* (Örley, 1881)

Ecological group: Endogeic.

Distribution: Cosmopolite – peregrine and synanthropic type. Europe, Caucasus, North America, North Africa, invasive in South America and New Zealand. Parthenogenetic, polyploid and invasive.

Habitat: Dunghill and near wet sites (Mihailova 1966). We found it in beech forest near river and pine forest.

Distribution in Bulgaria: All over Bulgaria. Rhodope Mts (Černosvitov 1937, Mihailova 1966, Szederjesi 2013), Vitosha Mts (Černosvitov 1937, Šapkarev 1986, Stojanović et al. 2012), Western Stara Planina Mts (Černosvitov 1937, Plisko 1963), Central Stara Planina Mts, Lyulin Mts (Černosvitov 1934, Plisko 1963), Belasitca Mts (Plisko 1963, Šapkarev 1986), Rila Mts (Zisci & Csuzdi 1986, Šapkarev 1986, Stojanović et al. 2012, Valchovski 2016a), Pirin Mts (Stojanović et al. 2012, Valchovski 2016b), Sofia Plain (Plisko 1963, Šapkarev 1986, Stojanović et al. 2012, Valchovski 2014), Thracian Lowland (Mihailova 1966, Šapkarev 1986); Osogovska Mt (Černosvitov 1937, Šapkarev 1986), Danubian Plain, Ludogorie (Šapkarev 1986), Sredna Gora Mts, Sakar Mts (Mihailova 1966, Valchovski & Velizarova 2016), Strandzha Mts (Valchovski & Misirlioglu 2017).

Distribution in Sarnena Sredna Gora: Kazanka vill. (Mihailova 1966).

New material: site 1: 1ex. [3]; site 13: 1ex. [2].

Fauna analysis – rare, mass, endemic and indicator species

During the investigation we established two rare species (*Allolobophora leoni* and *Dendrobaena hortensis*), two endemic species (*Dendrodaena balcanica* and *Cernosvitovia rebeli*) and one species with limited distribution in the mountains (*Dendrobaena alpina*).

Allolobophora leoni has been previously found once in the northwestern part of Bulgaria (Michailova 1965). Our new locality is on the southern slope of an actively grazed pasture at 865 m a.s.l. bordering an old mesophile beech forest (site 3). The territory has thick soil horizon which is the prerequisite for the presence of endogeic earthworms. Only one adult species was collected in the spring-summer sampling period. This finding of *A. leoni* in the area of Sarnena Sredna Gora Mts is the most southeastern locality for the species within its entire range.

According to the available literature data, *D. hortensis* has been reported in two localities from Bulgaria – Starozagorski bani vill. (Michailova 1966), and Strandzha Mts (Szederjesi 2013). Recently it was recovered from Petrohan Pass in the Western Stara Planina Mts (unpublished data from the authors). This species has limited distribution and is present in low numbers (less numerous), and prefers organic and humid coastal soils (Michailova 1966). The new localities represent mesophilic old forests with humid soil horizon in the range of 350-900 m a.s.l. As found by Michailova (1966), all five specimens fell during the summer-autumn period.

Both endemic species (*D. balcanica* and *C. rebeli*) occur in the Balkan Peninsula. *Dendrobaena balcanica* was found during the field work in two new localities for Bulgaria – at 1015 and 1100 m a.s.l. The other known localities of this species are in Slavyanka Mts (Cernosvitov 1937) and Pirin Mts (Zicsi Csuzdi 1986). The species has also been found in the area of Petrohan Pass, Western Stara Planina Mts (unpublished data of the authors from 2017). *Cernosvetovia rebeli* has a wide altitudinal range in the mountains – 450 m to 1100 m a.s.l. We found this species in old mesophilic forests with thick soil horizon in the presence of dead rotting wood. It was collected in all three sampling periods. Common for Sredna Gora and Stara planina Mts.

Dendrobaena alpina is limited to the mountain areas. This epigeic earthworm is found in all Bulgarian mountains from the lower mountain belt to the alpine zone (Valchovski 2012). Apart from typical mountain habitats this species is also registered in old foothill forests. For the region of Sarnena Gora Mts, *D. alpina* can be used as a bioindicator of the middle-mountain microclimate and mountain habitats. On the southern slopes of the Bratan Region of Sarnena Sredna gora Mts this species is registered as low as 850 m a.s.l. (site 2) and on the northern slopes– at 550 m a.s.l. around the village of Turiya (site 13). Such trend in the distribution of mountain species on both sides of the mountain has been registered in other taxonomic groups, e.g. ground beetles (Teofilova & Kodzhabashev 2020) and small mammals (Miteva 2020), pointing their indicativeness concerning the mountain climatic conditions and the lower limit of the middle mountain belt.

Based on the species richness of each sampling site we could classify the habitats of the earthworms from Sarnena Sredna Gora Mts into four groups:

1) Degraded habitats, arable lands with destroyed soil structure, suspended soil formation process or eroded soil. Found 1 or 2 species.

2) Xerothermic habitats with arid and heavily drained soils. Found 3 species.

3) Mesothermal habitats with moderately moist soils. Found 4 or 5 species

4) Habitats with moist soils rich of organic matter. Found 6 or 7 species.

The first group includes all arable lands, plain xerothermic pastures with active grazing and tree plantations. The habitats in sampling sites: 3, 4, 6, 14, 15, 20 - 26 (Figure 1, coloured in blue) can be assigned to this group. All they have suffered severe degradation as a result of anthropogenic activities. Depending on their location and altitude the identified species in these areas are mostly ecologically plastic and widespread/common. In Sarnena Gora Mts this is usually *Lumbricus rubellus* which has been found in every degraded habitat.

The second group of habitats includes both natural and partially degraded or secondary habitats, which are in a stage of natural restoration. To this group belong the

xerothermic and meso-xerothermic forests in the foothills of the Bratan Region of Sarnena Gora Mts and the Chirpan Heights Region: 2, 12, 16, 17, 18, 19 (Figure 1, coloured in green). The soil in these habitats is rich in organic matter and with thick leaf litter but during the summer months due to high temperatures, drainage and relatively low density it dries out and the worms fall into summer diapause.

The third group includes mesothermal habitats, typical for the low and middle mountain belt with year-round moist and with thick leaf litter covered soil. The main natural woodland vegetation is beech or beech with different mesophilic species. *Dendrobaena alpina* is a typical species here, additionally *D. hortensis*, *D. balcanica* and *C. rebeli* could be mentioned. These localities are coloured in yellow on the map (Figure 1).

The habitats from the fourth group are located near waters (rivers) as well as in old forests with moist and rich soils throughout the year. In our studies habitats 5, 10, 11 and 13 were identified and classified as such (Figure 1, colored in orange). One of the richest in species places is the area around the village of Kazanka where nine earthworm species have been registered (Michailova 1966). Such habitats are indicative for a high diversity of earthworms in Sarnena Sredna Gora Mts and Bulgaria. They can also be included in the list of representative habitats for earthworms and regularly monitored.

Occurrence

The most widespread (found in 15 sites) and numerous species was *L. rubellus* (64 specimens representing 43% of all identified individuals) (Table 2). It occurred in all habitats affected by human activity and was completely absent or has a very low density in the preserved habitats, e.g. old forests and habitats with moist soils.

Other comparatively common species found in 5 to 8 localities (with occurrence between 20 and 30%) were: *D. alpina* (13% abundance and 31% occurrence), *E. fetida* (5% abundance and 27% occurrence) and *C. rebeli* (8% abundance and 19% occurrence). The remaining 13 species were registered with less than eight specimens (abundance below 5%) in less than 5 localities (occurrence below 15%).

Species found in a single locality were *Apporectodea longa* (site 5), *A. jassyensis* (site 9), *Allolobophora leoni* (site 3) and *Eisenia lucens* (site 13), the last three being present by only one specimen each. These species have 4% occurrence (calculated on the basis of 26 localities) and low abundance (less than 1%).

Dendroaena balcanica, *D. hortensis*, *D. octaedra* and *O. lacteum* have an extrazonal distribution for the region as the last three species have been found in coastal habitats with naturally preserved woodlands having deep soil layer rich in humified and surface rotting organic matter. In total, by the number of individuals collected, the four dominant species compile 70% of all identified earthworm species. *Dendrobaena balcanica* is a relatively rare species and has specific requirements for environmental conditions, as it was also found by Michailova (1966).

Seasonal dynamics of the earthworms

A total of 381 specimens and 17 species of earthworms were found and identified during the recent study. About half of them (198 specimens or 52%), belonging to 13 species (77% of species detected), were determined in the spring-summer [1] period, 64 specimens (17%) belonging to 10 species (59%) were found in the summer-autumn [2] period, and 90 specimens (31%) belonging to 9 species (53%) – in the autumn-spring [3] period (Table 2). *Allolobophora leoni*, *A. rozea*, *A. longa*, *D. balcanica*, *E. lucens* were registered only in the spring-summer period, while *A. jassyensis* and *D. octaedra* were caught only in the summer-autumn season, and *B. rubidus*, *B. eiseni*, *D. alpine* and *L. rubellus* were registered in all three collection periods. The other species were caught in two consecutive seasons or have a pronounced summer diapause, such as *A. handlirschi* and *E. fetida*.

Table 2. Distribution among the sampling sites, frequency of occurrence (F), seasonal activity and abundance (number of specimens from the species, and % of all specimens determined to species level, e.g. 150) of the earthworm species from Sarnena Sredna Gora Mts.

Species	Sampling sites	F (%)	Season (sampling period)	Abundance (No/%)
Allolobophora leoni	3	4	1	1 ex/1%
Aporrectodea rosea	10,11	8	1	2 ex/1%
Aporrectodea longa	5	4	1	7 ex/5%
Aporrectodea handlirschi	2,9,11	12	1; 3	4 ex/3%
Aporrectodea jassyensis	9	4	2	1 ex/1%
Bimastos eiseni	5,8,10,16	15	1; 2; 3	5 ex/3%
Bimastos rubidus	1,5,7,13	15	1; 2; 3	5 ex/3%
Cernosvitovia rebeli	5,9,10,17,18	19	1; 2	12 ex/8%
Dendrobaena alpina	2,4,6,7,8,9,10,13	31	1; 2; 3	20 ex/13%
Dendrobaena balcanica	5,8	8	1	4 ex/3%
Dendrobaena hortensis	1,10,11	12	2; 3	5 ex/3%
Dendrobaena octaedra	11,13	8	2	7 ex/5%
Eisenia lucens	13	4	1	1 ex/1%
Eisenia fetida	5,7,11,12,18,19,22	27	1; 3	8 ex/5%
Lumbricus rubellus	3,7,9,10,11,12,13,14,15, 17,18 19,23,25,26	58	1; 2; 3	64 ex/43%
Lumbricus terrestris	1,11	8	1; 2	2 ex/1%
Octalasion lacteum	1,13	8	2; 3	2 ex/1%

Comparative analysis of the lumbricid fauna of Sarnena Sredna Gora Mts with its neighboring territories

When comparing the earthworm faunas of the three parts of Sredna Gora Mts (Table 3) (Sarnena, Sashtinska and Ihtimanska) 21 species belonging to nine genera were found in Sarnena Sredna Gora Mts. The published data of the other two parts Valchovski & Velizarova (2016) and Valcovski & Szederjesi (2016) include a total of 13 species, of which 10 species (48% of all for the mountain) for Ihtimanska and 9 species (43%) for Sashtinska Sredna Gora Mts. Six species were common for the three parts of the mountain (29%), and 8 species (38%) were characteristic only for Sarnena Gora Mts.

A total of 26 species were reported for Sarnena Gora Mts and Central Stara Planina Mts (Stojanovic et al. 2013) (Table 3). Eight species of them (31%) were common to both territories (*B. rubidus*, *C. rebeli*, *D. alpina*, *E. lucens*, *E. tetraedra*, *L. rubellus*, *L. terrestris* and *O. lacteum*); five species (19%) were found only in the Central Stara Plnanina Mts (*Allolobophora robusta robusta, Dendrobaena attemsi, Dendrobaena rhodopensis, Lumbricus polyphemus* and *Proctodrilus opisthoductus*) and 13 species (50%) were found only in Sarnena Gora.

The results of the comparison of the earthworm fauna between Sredna Gora Mts and the Upper Thracian Lowland (Mihailova 1966, Šapkarev 1986) showed 16 species (59%) common to both territories, and 6 species (22%) found only in the Thracian Lowland (*Allolobophora bulgarica, Cernosvitovia biserialis, Dendrobaena attemsi, Octodrilus complanatus, Proctodrilus antipai* and *P. tuberculatus*).

Determined only in Sarnena Gora and missing in all neighboring areas were 4 species (19%) (*Allolobophora leoni, D. balcanica, D. attemsi, D. octaedra*).

Table 3. Distribution of lubricid species in Sredna Gora Mts, Upper Thracian Lowlands and Central Stara Planina Mts: SGSR – Sarnena Sredna Gora Mts; SGI – Ihtimanska Sredna Gora Mts; SGS – Sashtinska Sredna Gora Mts; TL – Upper Thracian Lowlands; SPC – Central Stara Planina Mts; (+) – our data ; MP – Mihailova (1966); V&V – Valchovski & Velizarova (2016); V&S – Valchovski & Szederjesi (2016); SJ – Sapkarev (1986); TT – Teofilova (2016); SM – Stojanovic et al. (2013).

№	Species	SGSR	SGS	SGI	TL	SPC
1	*Allolobophora bulgarica*				MP	
2	*Allolobophora chlorotica*	MP			MP; SJ	
3	*Allolobophora leoni*	+				
4	*Allolobophora robusta robusta*					SM e. a.
5	*Aporrectodea caliginosa*	MP		V&V	MP; SJ	
6	*Aporrectodea handlirschi*	+			MP; SJ	
7	*Aporrectodea jassyensis*	+ ; MP; V&S	+		MP	
8	*Aporrectodea longa*	+; MP			MP	
9	*Aporrectodea rosea*	+ ; MP; V&S	V&V	V&V; SJ	MP; SJ	
10	*Aporrectodea trapezoides*	MP		SJ	MP; SJ	
11	*Bimastos eiseni*	+		V&V	MP	
12	*Bimastos rubidus*	+	V&S	V&V	MP; SJ	SM e. a.
13	*Cernosvitovia biserialis*				MP	
14	*Cernosvitovia rebeli*	+	V&V	V&V	MP	SM e. a.
15	*Dendrobaena alpina*	+	V&V	V&V	MP	SM e. a.
16	*Dendrobaena attemsi*				MP	SM e. a.
17	*Dendrobaena balcanica*	+				
18	*Dendrobaena hortensis*	+; MP				
19	*Dendrobaena octaedra*	+				
20	*Dendrobaena rhodopensis*					SM e. a.
21	*Eisenia fetida*	+	+; V&S		MP; SJ	
22	*Eisenia lucens*	+; V&S			MP	SM e. a.
23	*Eiseniella tetraedra*	MP; V&S	+		MP; SJ	SM e. a.
24	*Lumbricus rubellus*	+; MP	V&V	V&V	MP; SJ	SM e. a.
25	*Lumbricus polyphemus*					SM e. a.
26	*Lumbricus terrestris*	+	V&V	V&V		TT
27	*Octodrilus complanatus*				MP	
28	*Octolasion lacteum*	+; MP		V&V	MP; SJ	SM e. a.
29	*Proctodrilus antipai*				MP	
30	*Proctodrilus opisthoductus*					SM e. a.
31	*Proctodrilus tuberculatus*				MP	
	number of species	21	9	10	22	13

During our field work, four species were not identified, but they were reported for the territory of Sarnena Gora Mts by other authors (Mihailova 1966, Uzunov 2010, Valchovski & Szederjesi 2016): *Allolobophora chlorotica, Aporrectodea caliginosa, Aporrectodea trapezoides* and *Eiseniella tetraedra. Allolobophora chlorotica* and *Eiseniella tetraedra* lead an

amphibiotic life and are typical for habitats with very high humidity and wet soils. *Aporrectodea caliginosa* and *Aporrectodea trapezoides* are primarily terrestrial but are often found in close proximity to water bodies orswampy areas (Chekanovskaia 1962, Uzunov 2010). According to Uzunov (2010), although being terrestrial, these species have often been established in numerous hydrobiological researches in Bulgaria. A reason for their lack in our collections may be the impossibility to install and expose terrestrial traps in swampy, coastal and aquatic habitats.

Conclusions

Sarnena Sredna Gora has an extremely rich lumbricid fauna (21 species found, 42% of the lumbricid fauna of Bulgaria) which is probably due to the location of the studied area, its relief and contact areas and also sampling efforts.

The distribution of the identified species by localities and habitats shows the dependence of earthworms on the humidity of the environment, the presence of organic matter in the soil and the surface, the microclimatic conditions, the degree of anthropogenic interference and degradation of the habitats. The richest in species areas are with riparian or year-round wet habitats with naturally preserved vegetation and organic matter. The poorest are the degraded agricultural areas where the only species found is *Lumbricus rubellus* or it is also missing.

Four habitats in Sarnena Sredna Gora Mts, where 6 or 7 species were found, namely ridge old beech forest (site 5), mixed forests (sites 10 and 13) and a river bank near pasture with single old trees along with a riparian forest (site 11), can be used as a standard for high earthworms diversity.

The distribution of *Dendrobaena alpina* is indicative for the boundaries of the middle mountain belt in Sarnena Sredna Gora Mts.

The method with pitfall traps used is unique in terms of range and duration of the study, which can be used practically throughout the year. This method is used for the first time in studying the earthworm fauna. Further research and analysis is needed to promote, calibrate and unify it for the purposes of fauna and ecological studies of earthworms.

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Appendix. Distribution, number of collected earthworm species from every sampling site and previous literature data for the region of Sarnena Sredna Gora Mts: M - Mihailova (1966); V&S - Valchovski & Szederjesi (2016).

Sampling sites	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
Altitude (m)	344	860	865	863	1100	975	1022	1015	1008	898	670	633	583
Allolobophora chlorotica													
Allolobophora leoni			1										
Aporrectodea caliginosa													
Aporrectodea handlirschi		1							2		1		
Aporrectodea jassyensis									1				
Aporrectodea longa					7								
Aporrectodea rosea										1	1		
Aporrectodea trapezoides													
Aporrectodea sp.	1	6			8				3	4	1	1	
Bimastos eiseni					1			1		2			
Bimastos rubidus	2				1		1						1
Cernosvitovia rebeli					3				1	1			
Dendrobaena alpina		1		1		4	4	3	4	2			1
Dendrobaena balcanica					3			1					
Dendrobaena hortensis	1									3	1		
Dendrobaena octaedra											1		6
Dendrobaena sp.		1		1	3	3	1		2	9	2		5
Eisenia fetida					2		1				1	1	
Eisenia lucens													1
Eisenia sp.											2		
Eiseniella tetraedra													
Lumbricus rubellus			2				1		2	5	4	1	2
Lumbricus terrestris	1										1		
Lumbricus sp.		2		1		5	3	1	4	9	12	1	3
Octalasion lacteum	1												1
Unidentified	1	4	4	2	14	4	7	3	9	22	2	5	16
number of species/specimens	5/6	3/15	2/7	2/5	6/42	2/16	4/18	4/9	5/28	6/58	7/29	3/9	6/36

Appendix. Continued

Sampling sites	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**		
Altitude (m)	366	353	386	487	449	418	435	406	363	280	288	290	290	M/V&S	Total
Allolobophora chlorotica														M	0
Allolobophora leoni															1
Aporrectodea caliginosa														M	0
Aporrectodea handlirschi															4
Aporrectodea jassyensis														M/ V&S	1
Aporrectodea longa														M	7
Aporrectodea rosea														M/ V&S	2
Aporrectodea trapezoides														M	0
Aporrectodea sp.		1		1					1						27
Bimastos eiseni			1												5
Bimastos rubidus															5
Cernosvitovia rebeli				6	1										12
Dendrobaena alpina															20
Dendrobaena balcanica															4
Dendrobaena hortensis														M	5
Dendrobaena octaedra															7
Dendrobaena sp.						1									0
Eisenia fetida					1	1			1						8
Eisenia lucens														V&S	1
Eisenia sp.			1												3
Eiseniella tetraedra														M/V& S	0
Lumbricus rubellus	5	8		1	5	5				2		4	17	M	64
Lumbricus terrestris															2
Lumbricus sp.		1	1		2	1		2		1	1		6		56
Octalasion lacteum														M	2
Unidentified	3	10	1	0	2	1	1	3	0	0	0	0	0		117
number of species/ specimens	1/8	2/20	3/4	3/8	3/11	3/9	0/1	1/5	2/2	1/3	1/1	1/4	1/23		381

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Fauna of Sarnena Sredna Gora Mts, Part 1
ZooNotes, Supplement 9, 2020

Records of moths from the area of Stara Zagora City (Sarnena Gora Mts): literature review and a case study (Lepidoptera)

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Abstract. Data for 333 Lepidoptera species from Sarnena Gora Mts, mostly from the surroundings of Stara Zagora City, both from original and literature data are reported. Material was collected in 11 localities, 189 species are new for the explored area. One species: *Mirificarma maculatella* (Hübner, 1796) is new for the Bulgarian fauna. This list do not pretended to be complete, it is a preliminarily one.

Key words: Lepidoptera, Bulgaria, faunistic, Sredna Gora Mts.

Introduction

The moths of Sarnena Gora Mts are not studied in detail. Some species records were published by Nedyalkov (1909) for Stara Zagora, and by Tuleshkov (1965), mainly for the area of Stara Zagora City and Starozagorski Mineralni Bani Resort. Data for some new and rare for Bulgaria species, collected near Buzovgrad Village are presented in the article of Bocharov (1959). Here we summarize all these records and report some new ones mainly from a house yard in Hrishteni village, approximately 7 km east of Stara Zagora City and from three nights collecting at light above Stara Zagora City. More research is needed during the whole year and in different localities and habitats to complete the species list.

Material and Methods

Part of materials were collected during 2018-2020 by Dilian Georgiev (and one specimen by his little son Julian, mentioned in the species list below) and after identified by Ilcho Kolev. Some old records were also reported (e.g. *Acherontia atropos* (Linnaeus, 1758), during 90s in Stara Zagora city). We report of few species recorded mainly in one house yard at Hrishteni village. Majority of the Pyraloidea specimens, photographed by Dilian Georgiev in 2020 and collected in October, 07 2020 are identified by Colin W. Plant (Bishops Stortford, UK), to whom we express our sincere gratitude. Dr Boyan Zlatkov (IBER, Sofia, Bulgaria) identified the Tortricidae specimens from October, 2020.

Another part of material, originated from loc. 11 was collected at light by SB & AN during three nights. Collecting methodology involved 2 portable light traps with an 8 watt actinic (368 nm) and 8 watt "Blacklight", both powered by 12 volt 9Ah batteries, as well as a Finnish "tent trap" with a 160 watt MV bulb at the top of the pole and a 20 watt (368 nm) black light over the catching pot below. An additional 20 watt (368nm) lamp was also

positioned about 70 m from the tent trap. The distance between the Finnish "tent trap" and the light traps, as well as between the light traps themselves was sometime more than 1 km, as they were deployed in different positions and habitats if wherever possible. All traps ran throughout the night.

Genitalia were fixed on glass slides in Euparal mountant after staining with a 2% Merbromin solution. All genitalia slides were photographed by S. Beshkov with a Zeiss stereo microscope Stemi 2000-C with axioCameRc 5s camera; solitary everted vesicas were photographed in alcohol before mounting on glass. Insects and collecting places were photographed with Sony DSChX400v digital camera.

List of localities and collection methods:

1. Hrishteni vill., yard of a house, under light, hand collecting, collecting of dead individuals and photographing;
2. N of Dalboki vill., along small stream, among bushes and rocks, N42 29 30.0 E25 46 13.3, 329 m;
3. N of Lyulyak vill., old stone quarry, grasses and bushes near *Quercus* forest, N42 31 21.8 E25 40 33.19, 569 m;
4. W of Kolena vill., *Pinus nigra* plantation, N42 28 58.1 E25 42 20.4, 359 m, beer trap;
5. S of Kolena vill., grasslands and bushes near agricultural lands, N42 28 4.42 E25 43 30.03, 225 m;
6. Stara Zagora city, Ayazmoto Park, under the lamps of "Jurassic" Restaurant, N42 26 20 E25 37 0.88, 339 m;
7. S of Hrishteni vill., near water source and a stream, wine vinegar trap hanging on *Sambucus* tree, N42 27 03.51 E25 42 8.88, 221 m
8. S of Shanovo vill., *Quercus* spp. and *Carpinus* spp. forest, netting, N42 31 32.01 E25 38 54.45, 500 m
9. Hadzhiolova Koria Hill, W of Hrishteni vill., sparce *Quercus* spp. forest with meadows and bushes, N42 26 55.37 E25 41 52.51, 242 m
10. S of Lyulyak vill., large meadow with bushes near *Quercus* spp. and *Carpinus* spp. forest, N42 30 1.24 E25 41 6.96, 379 m a.s.l.
11. Above Stara Zagora City on the road to Dubrava, 458m, N42.4376, E025.5959, meadows with *Carpinus, Ulmus, Paliurus spins-christi, Jasminum, Syringa, Dictamnus albus, Euphorbia*, S. Beshkov & A. Nahirnić leg. at lamps and light traps.

Results

A total of 333 species from 29 families are reported for the studied area of which 189 species are registered only during present study. One species: *Mirificarma maculatella* (Hübner, 1796) is new for the Bulgarian fauna. Families are arranged according to Aarvik *et al.* (2017). The sequence and nomenclature of families Erebidae and Noctuidae follow Yela *et al.* (2011) with subsequent changes incorporated from recent taxonomic revisions. The Geometridae are arranged according to Hausmann & Sihvonen (2019). For remaining groups, we have followed the *Fauna Europaea* website.

Hepialidae

***Triodia sylvina* (Linnaeus, 1761):** loc. 11, 7.10.2020.

Incurvariidae

***Incurvaria masculella* (Denis & Schiffermüller, 1775)**: loc. 8, 25.4.2020.

Adelaidae

***Adela reaumurella* (Linnaeus, 1758)**: loc. 8, 25.4.2020; loc. 10, 05.5.2020, identified on picture taken by D. Georgiev.

***Nematopogon* sp.**: loc. 8, 25.4.2020.

Psychidae

***Canephora hirsuta* (Poda, 1761)**: loc.1, 26.4.2020 (case).

Tineidae

***Trichophaga trapetzella* (Linnaeus, 1758):** loc. 1, 13.6.2020.

***Euplocamus anthracinalis* (Scopoli, 1763)**: loc. 2, 6.5.2018.

***Euplocamus ophisa* (Cramer, 1776)**: loc. 1, 31.5.2020, 01.6.2020.

Gracillariidae

***Phyllonorycter* sp.**: loc. 1, 17.4.2018.

Ypsolophidae

***Ypsolopha persicella* (Fabricius, 1787):** loc. 11, 7.10.2020, genitalia checked.

Plutellidae

***Plutella xylostella* (Linnaeus, 1758)**: loc 1, 13-18.6.2018, 4-5.7.2018, 22.6.2019; loc. 11, 7.10.2020.

Tortricidae

***Philedone gerningana* (Denis & , 1775)**: loc. 11, 7.10.2020.

***Cnephasia* sp. 1**: loc. 6, 20.4.2018.

***Cnephasia* sp. 2**: loc. 1, 04.6.2020.

***Clepsis pallidana* (Fabricius, 1776)**: loc 1, 5.7.2018.

***Acleris rhombana* (Denis & Schiffermüller, 1775)**: loc. 11, 7.10.2020.

***Acleris variegana* (Denis & , 1775)**: loc. 11, 7.10.2020.

***Archips rosana* (Linnaeus, 1758)**: loc. 1, 31.5.2020.

***Agapeta hamana* (Linnaeus, 1758):** loc. 1, 14.6.2020.

***Agapeta zoegana* (Linnaeus, 1767):** loc. 11, 7.10.2020.

***Eugnosta magnificana* (Rebel, 1914)**: loc. 11, 7.10.2020.

***Celypha striana* (Denis & , 1775)**: loc. 1, 4.6.2020.

***Olethreutes arcuella* (Clerck, 1759)**: loc. 10, 05.5.2020, identified on picture taken by D. Georgiev. Sure identification is possible only after examination of genitalia. Probably misidentification with *O. subtilanus* is possible.

***Lobesia botrana* (Denis & , 1775)**: loc. 1, 4.7.2018, 10.7.2019, 25.4.2020.

***Epinotia nigristriana* Budashkin & Zlatkov, 2011**: loc. 11, 7.10.2020, genitalia checked. Reported from Kresna Gorge, Volcanic Hill of Kozhuh and Greece (B. Zlatkov, pers. comm.) and several localities in Eastern Rhodopes in BG (S. Beshkov, unpublished data).

***Notocelia incarnatana* (Hübner, 1800)**: loc. 11, 7.10.2020.

***Dichrorampha caucasica* (Danilevsky, 1948)**: loc. 11, 7.10.2020, genitalia checked. Reported from Kresna Gorge and Volcanic Hill of Kozhuh (B. Zlatkov, pers. comm.).

Limacodidae

***Apoda limacodes* (Hufnagel, 1766)**: loc. 1, 21.6.2019; loc. 11, 15.6.2019.

Sesiidae

***Chamaesphecia chalciformis* (Esper, 1804)**: loc. 3, 18.5.2018.

Brachodidae

***Brachodes appendiculata* (Esper, 1783)**: loc. 11, 15.6.2019, collected at a day time.

Cossidae

***Dyspessa salicicola* (Eversmann, 1848)**: loc. 11, 15.6.2019.
***Dyspessa ululа* (Borkhausen, 1790)**: loc. 11, 5.5.2019.

Depressariidae

***Agonopterix alstromeriana* (Clerck, 1759)**: loc. 1, 14.3.2018.
***Ethmia pusiella* (Linnaeus, 1758)**: loc. 1, 14.3.2018; loc. 11, 7.10.2020.

Gelechiidae

***Mirificarma maculatella* (Hübner, 1796)**: loc. 11, 15.6.2019, 2 males (Figs 1, 2). New species for Bulgaria.

Thyrididae

***Thyris fenestrella* (Scopoli, 1763)**: loc 1, 7.5.2018; loc. 11, 15.6.2019, at a day time.

Pterophoridae

***Cnaemidophorus rhododactyla* (Denis & Schiffermüller, 1775)**: loc 1, 25.5.2018.
***Emmelina monodactyla* (Linnaeus, 1758)**: loc 1, 14.3.2018, 30.1.2019; loc. 8, 25.4.2020.

Pyralidae

***Phycita* sp.:** loc 1, 14.7.2020.
***Oxybia transversella* (Duponchel, 1836)**: loc. 11, 7.10.2020.
***Stemmatophora brunnealis* (Treitschke, 1829)**: loc 1, 19.8.2019.
***Episcythrastis tabidella* (Mann, 1864)**: loc. 1, 31.8.2020. For 100% sure identification need genitalia examination to eliminate e.g., *Ephestia spp*.
Asalebria or ***Psorosa*** sp. Examination of genitalia is necessary. Might be an important species.
***Pyralis farinalis* Linnaeus, 1758**: loc 7, 20-21.5.2018.
***Endotricha flammealis* (Denis & Schiffermüller, 1775)**: loc. 1, 13.8.2020.
***Aglossa pinguinalis* (Linnaeus, 1758)**: loc 1, 14.7.2020.
***Actenia* (=*Stemmatophora brunnealis*) (Treitschke, 1829)**: loc. 1, 31.8.2020.
***Hypsopygia costalis* (Fabricius, 1775)**: loc 1, 8.5.2018, 07.6.2020.

Crambidae

***Agriphila tristella* (Denis & Schiffermüller, 1775)**: loc. 11, 7.10.2020.
***Agriphila tolli* (Błeszyński, 1952):** loc. 11, 7.10.2020.
***Chrysocrambus cassentiniellus* (Herrich-Schäffer, [1848]) (=*linetella* Fabricius, 1781)**: loc. 1, 13-18.6.2018.
***Thisanotia chrysonuchella* (Scopoli, 1763)**: loc. 9, 26.4.2020.
***Cynaeda dentalis* (Denis & Schiffermüller, 1775)**: loc. 1, 15.6.2018.
***Hellula undalis* (Fabricius, 1781):** loc. 1, 31.8.2020; 11: 7.10.2020, genitalia checked. Probably immigrant.
***Pyrausta aurata* (Scopoli, 1763)**: loc. 1, 25.4.2020; loc. 8, 25.4.2020.
***Sitochroa verticalis* (Linnaeus, 1758)**: loc. 1, 10.4.2018, 8.5.2018; loc. 4, 05.6.2020.
***Ostrinia nubilalis* (Hübner, 1796)**: loc. 1, 19.8.2019.

***Metasia ophialis* (Treitschke, 1829)**: loc. 1, 10.7.2019; loc. 11, 7.10.2020.

***Udea ferrugalis* (Hübner, 1796)**: loc. 11, 7.10.2020.

***Nomophila noctuella* (Denis & Schiffermüller, 1775)**: loc. 1, 11.7.2019, 11.8.2019, 15.9.2019.

***Palpita vitrealis* (Rossi, 1794):** loc. 11, 7.10.2020.

***Cydalima perspectalis* (Walker, 1859)**: loc. 1, 17.5.2018, 3.9.2019, 17.9.2020. Remark: recently found in the area as an invasive species.

Drepanidae

***Watsonalla binaria* (Hufnagel, 1767):** loc. 11, 7.10.2020.

***Cilix glaucata* (Scopoli, 1763)**: loc. 1, 8.4.2018, 19.8.2019.

Geometridae

Geometrinae

***Aplasta ononaria* (Fuessly, 1783)**: reported by Tuleshkov (1965) from a fruit tree plantation at Ayazmoto Hill in Stara Zagora City; loc. 11, 15.6.2019.

***Thetidea smaragdaria* (Fabricius, 1787)**: loc. 11, 5.5.2019; 15.6.2019.

***Hemistola chrysoprasaria* (Esper, 1795)**: loc. 1, 1.8.2019, 23.8.2019; loc. 11, 15.6.2019.

***Thalera fimbrialis* (Scopoli, 1763)**: reported by Tuleshkov (1965) from Ayazmoto Park in Stara Zagora City; loc. 11, 15.6.2019.

***Hemithea aestivaria* (Hübner 1799)**: reported by Tuleshkov (1965) from Stara Zagora City.

***Chlorissa viridata* (Linnaeus, 1758)**: reported by Tuleshkov (1965) from a fruit tree plantations above Stara Zagora City; loc. 11, 15.6.2019.

***Chlorissa cloraria* (Hübner, 1813)**: loc. 11, 15.6.2019.

***Phaiogramma etruscaria* (Zeller, 1849)**: loc. 1, 8.5.2018; 10.8.2020.

Ennominae

***Stegania dilectaria* (Hübner, 1790)**: reported by Tuleshkov (1965) from Ayazmoto Park in Stara Zagora City.

***Dicrognophos sartata* (Treitschke, 1827)**: reported by Bocharov (1959) from Buzovgrad Village and by Tuleshkov (1965) from Ayazmoto Park in Stara Zagora City.

***Heliomata glarearia* (Denis & Schiffermüller, 1775)**: reported by Tuleshkov (1965) from Starozagorski Mineralni Bani Resort; loc. 11, 15.6.2019.

***Isturgia murinaria* (Denis & Schiffermüller, 1775)**: loc. 1, 23.8.2019.

***Isturgia arenacearia* (Denis & Schiffermüller, 1775)**: reported by Tuleshkov (1965) from Starozagorski Mineralni Bani Resort.

***Neognopharmia stevenaria* (Boisduval, 1840)**: loc. 1, 24.5.2018, 04.6.2020; loc. 11, 5.5.2019, 15.6.2019.

***Chiasmia clathrata* (Linnaeus, 1758)**: reported by Tuleshkov (1965) from Starozagorski Mineralni Bani Resort.

***Therapis flavicaria* (Denis & Schiffermüller, 1775)**: reported by Tuleshkov (1965) from Starozagorski Mineralni Bani Resort.

***Pseudopanthera macularia* (Linnaeus, 1758)**: reported by Tuleshkov (1965) from the hills above Stara Zagora City; loc. 11, 5.5.2019.

***Eilicrinia trinotata* (Metzner, 1845)**: loc. 1, 1.5.2018.

***Ennomos quercinaria* (Hufnagel, 1767)**: reported by Tuleshkov (1965) from the hills above Stara Zagora City.

***Ennomos erosaria* (Denis & Schiffermüller, 1775)**: loc. 11, 7.10.2020, 1 male, genitalia checked.

***Selenia lunularia* (Hübner, 1788)**: loc. 11, 5.5.2019.

***Crocallis elinguaria* (Linnaeus, 1758)**: reported by Tuleshkov (1965) from Stara Zagora City.

***Alsophila aescularia* (Denis & Schiffermüller, 1775)**: loc. 1, 13.2.2019, 1.3.2019.

***Dasycorsa modesta* (Staudinger, 1879)**: loc. 1, 24.4.2019: also reported by Tuleshkov (1965) from Starozagorski Mineralni Bani Resort; loc. 11, 5.5.2019, 1 male.

***Apochima flabellaria* (Heeger, 1838)**: loc. 1, 5.2.2019, 6.3.2019.

***Theria rupicapraria* (Denis & Schiffermüller, 1775)**: loc. 1, 30.1.2019.

***Charissa obscurata* (Denis & , 1775)**: reported by Tuleshkov (1965) from the hills above Stara Zagora City; loc. 11, 15.6.2019.

***Charissa onustaria* (Herrich-Schäffer, 1852)**: loc. 11, 5.5.2019.

***Dyscia conspersaria* (Denis & , 1775)**: according to Tuleshkov (1965) reported by Dimitrov from Stara Zagora City. Perhaps this report concerns *Dyscia innocentaria sicanaria* (Oberthür, 1923) which is a common species in Bulgaria.

***Apocheima hispidaria* (Denis & Schiffermüller, 1775)**: loc. 1, 3.2.2019.

***Phigalia pilosaria* (Denis & Schiffermüller, 1775)**: loc. 1, 30.1.2019.

***Hypomecis punctinalis* (Scopoli, 1763)**: loc. 1, 8.4.2018.

***Lycia graecarius* (Staudinger, 1861)**: loc. 5, 3.4.2018, 1♀.

***Agriopis aurantiaria* (Hübner, 1799)**: loc. 1, 21.1.2019.

***Agriopis marginaria* (Fabricius, 1776)**: loc. 1, 20.2.2019.

***Nychoides waltheri* Wagner, 1919**: loc. 1, 24.5.2018, 3.6.2018; loc. 11, 15.6.2019, 2 males, genitalia checked.

***Selidosema plumaria* (Denis & Schiffermüller, 1775):** loc. 11, 7.10.2020. Reported by Tuleshkov (1965) from Ayazmoto Park in Stara Zagora City as *ericetaria* Villers, 1789, wnich is a synonym of *Selidosema brunnearia* (Villers, 1789), a species not presented on the Balkan Peninsula.

***Peribatodes rhomboidaria* (Denis & Schiffermüller, 1775)**: loc. 1, 9.5.2018; also reported by Tuleshkov (1965) from the hills above Stara Zagora City; Loc. 11, 5.5.2019

***Peribatodes correpteria* (Zeller, 1847)**: reported by Tuleshkov (1965) from the hills above Stara Zagora City as *Boarmia perversaria correpteria* Z.

***Peribatodes umbraria* (Hübner, 1809)**: loc. 1, 10.5.2018.

***Eumannia oppositaria* (Mann, 1864)**: reported by Tuleshkov (1965) from the hills above Stara Zagora City.

***Asovia maeoticaria* (Alphéraky, 1876)**: reported by Tuleshkov (1965) from Starozagorski Mineralni Bani Resort; loc. 1, 1.5.2018; loc. 11, 5.5.2019.

Sterrhinae

***Idaea rufaria* (Hübner, 1799)**: loc. 11, 15.6.2019, 4 males and 2 females, male genitalia checked.

***Idaea ochrata* (Scopoli, 1763)**: loc. 1, 13-18.6.2018; also reported by Tuleshkov (1965) from the hills above Stara Zagora City.

***Idaea rusticata* (Denis & Schiffermüller, 1775)**: loc. 1, 17.5.2018, 23.6.2019; also reported by Tuleshkov (1965) in great numbers from the hills above Stara Zagora City.

***Idaea filicata* (Hübner, 1799)**: reported by Tuleshkov (1965) from Ayazmoto Park in Stara Zagora City; loc. 11, 5.5.2019.

***Idaea dilutaria* (Hübner, 1799)**: loc. 11, 15.6.2019, 1 male, Gen. prep. 3./04.V.2020, S. Beshkov, male genitalia on glass in euparal. Aedeagus with 3 big cornuti (Fig. 3), normally it is with two cornuts.

***Idaea politaria* (Hübner, 1799)**: reported by Tuleshkov (1965) from Ayazmoto Park in Stara Zagora City as *Sterrha popitata* Hb.

***Idaea subsericeata* (Haworth, 1809)**: loc. 1, 13.5.2018.

***Idaea camparia* (Herrich-Schäffer, 1852):** loc. 1, 31.6.2020.

***Idaea ostrinaria* (Hübner, 1813)**: reported by Tuleshkov (1965) from Ayazmoto Park in Stara Zagora City.

***Idaea degeneraria* (Hübner, 1799)**: loc. 1, 1.5.2018, 17.5.2018; loc. 11, 7.10.2020.

***Idaea straminata* (Borkhausen, 1794)**: loc. 1, 17.5.2018, 8.6.2018.

***Idaea deversaria* (Herrich-Schäffer, 1852):** loc. 11, 15.6.2019, 1 male, genitalia checked, on paper.

***Scopula ornata* (Scopoli, 1763)**: loc. 1, 26.4.2020; loc. 11, 5.5.2019, 7.10.2020. Also reported by Tuleshkov (1965) from Starozagorski Mineralni Bani Resort and Ayazmoto Park in Stara Zagora City.

***Scopula decorata* (Denis & , 1775)**: reported by Tuleshkov (1965) from the hills above Stara Zagora City; loc. 11, 5.5.2019.

***Scopula rubiginata* (Hufnagel, 1767)**: reported by Tuleshkov (1965) from Ayazmoto Park in Stara Zagora City as "*Scopula ternata* Schr (=*Acidalia rubiginata* Hufn) (749)". The number 749 from Buresh & Tuleshkov (1936) is associated to *Scopula rubiginata*, not to *S. ternata.*

***Scopula marginepunctata* (Goeze, 1781)**: loc. 1, 25.5.2018; also reported by Tuleshkov (1965) from the hills above Stara Zagora City; loc. 11, 5.5.2019; 15.6.2019; 7.10.2020.

***Scopula confinaria* (Herrich-Schäffer, 1847)**: reported by Tuleshkov (1965) from Ayazmoto Park in Stara Zagora City as *Sterrha luridata confinaria* H. S.

***Rhodostrophia discolunctaria* Amsel, 1935**: loc. 11, 15.6.2019.

***Timandra comae* Schmidt, 1931**: loc. 1, 3.6.2018, 1.8.2018, 13.8.2018, 3.9.2018; also reported by Tuleshkov (1965) from Starozagorski Mineralni Bani Resort.

***Cyclophora albiocellaria* (Hubner, 1789)**: reported by Tuleshkov (1965) from Starozagorski Mineralni Bani Resort.

***Cyclophora puppillaria* (Hübner, 1799)**: loc. 11, 15.6.2019, 7.10.2020.

***Cyclophora ruficiliaria* (Herrich-Schäffer, 1855)**: reported by Tuleshkov (1965) from a fruit tree plantations above Stara Zagora City; loc. 11, 5.5.2019, 1 male, genitalia checked, on paper.

***Cyclophora suppunctaria* (Zeller, 1847)**: reported by Tuleshkov (1965) from a fruit tree plantations and vineyards above Stara Zagora City; loc. 11, 5.5.2019, 1 male, genitalia checked, on paper.

***Cyclophora linearia* (Hübner, 1799)**: reported by Tuleshkov (1965) from a fruit tree plantations above Stara Zagora City.

Larentiinae

***Aplocera plagiata* (Linnaeus, 1758)**: loc. 11, 5.5.2019, 7.10.2020. Reported by Tuleshkov (1965) from Ayazmoto Park in Stara Zagora City.

***Asthena albulata* (Hufnagel, 1767)**: reported by Nedyalkov (1909) from Stara Zagora City and Tuleshkov (1965) from Starozagorski Mineralni Bani Resort; loc. 11, 5.5.2019.

***Orthonama obstipata* (Fabricius, 1794)**: reported by Tuleshkov (1965) from Ayazmoto Park in Stara Zagora City.

***Xanthorhoe fluctuata* (Linnaeus, 1758)**: loc. 1, 27.3.2019, 25.4.2020; also reported by Tuleshkov (1965) from Ayazmoto Park in Stara Zagora City; loc. 11, 5.5.2019.

***Protorhoe corollaria* (Herrich-Schaffer, 1848)**: loc. 1, 5.7.2018.

***Camptogramma bilineata* (Linnaeus, 1758)**: loc. 4, 05.6.2020; loc. 11, 7.10.2020.

***Earophila badiata* (Denis & Schiffermüller, 1775)**: loc. 1, 22.3.2019.

***Pennithera firmata* (Hübner, 1822):** loc. 11, 7.10.2020.

***Thera variata* (Denis & Schiffermüller, 1775)**: loc. 11, 5.5.2019.

***Coenotephria ablutaria* (Boisduval, 1840)**: loc. 11, 7.10.2020.

***Operophtera brumata* (Linnaeus, 1758)**: loc. 1, 18.1.2019.

***Horisme vitalbata* (Denis & Schiffermüller, 1775)**: loc. 1, 9.5.2018; loc. 11, 5.5.2019, 15.6.2019.

***Horisme corticata* (Treitschke, 1835)**: loc. 1, 9.4.2018, 26.4.2020; also reported by Tuleshkov (1965) from the hills above Stara Zagora City; loc. 11, 5.5.2019, 15.6.2019.

***Perizoma albulata* (Denis & Schiffermüller, 1775):** loc. 11, 15.6.2019.

***Gymnoscelis rufifasciata* (Haworth, 1809)**: loc. 1, 12.3.2019.

***Eupithecia linariata* (Denis & Schiffermüller, 1775)**: reported by Tuleshkov (1965) from Ayazmoto Park in Stara Zagora City.

***Eupithecia silenicolata* Mabille, 1867**: reported by Tuleshkov (1965) from a fruit tree plantation at Ayazmoto Hill in Stara Zagora City.

***Eupithecia graphata* (Treitschke, 1828)**: reported by Tuleshkov (1965) from Ayazmoto Park in Stara Zagora City.

***Eupithecia breviculata* (Donzel, 1837)**: reported by Bocharov (1959) from Buzovgrad Village.

***Eupithecia centaureata* (Denis & Schiffermüller, 1775)**: loc. 1, 12.5.2018, 9.6.2018; loc. 11, 5.5.2019.

***Eupithecia denotata* (Hübner, 1813)**: reported by Tuleshkov (1965) from the hills above Stara Zagora City.

Lasiocampidae

***Trichiura crataegi* (Linnaeus, 1758)**: reported by Tuleshkov (1965) from Starozagorski Mineralni Bani Resort.

***Malacosoma neustria* (Linnaeus, 1758)**: reported by Tuleshkov (1965) from Stara Zagora City.

***Malacosoma castrensis* (Linnaeus, 1758)**: loc. 1, 11.6.2018; loc. 11, 15.6.2019.

***Macrothylacia rubi* (Linnaeus, 1758)**: reported by Tuleshkov (1965) from Starozagorski Mineralni Bani Resort.

***Gastropacha quercifolia* (Linnaeus, 1758)**: loc. 1, 17.8.2018, loc. 11, 15.6.2019.

Brahmaeidae

***Lemonia balcanica* (Herrich-Schaffer, 1847)**: loc. 11, 7.10.2020. Reported by Tuleshkov (1965) from Stara Zagora City.

Saturniidae

***Saturnia pyri* (Denis & , 1775)**: loc. 1 (two copulating specimens on a house wall, during daytime, observed and photographed), 15.4.2019; also reported by Tuleshkov (1965) from Starozagorski Mineralni Bani Resort; loc. 11, 5.5.2019.

Sphingidae

***Laothoe populi* (Linnaeus, 1758)**: loc 1, 19.8.2019.

***Marumba quercus* (Denis & , 1775)**: loc. 2, 6.3.2018; loc. 11, 15.6.2019.

***Sphinx ligustri* Linnaeus, 1758**: reported by Tuleshkov (1965) from Starozagorski Mineralni Bani Resort and Ayazmoto Park in Stara Zagora City; loc. 11, 15.6.2019.

***Agrius convolvuli* (Linnaeus, 1758)**: many observations in Stara Zagora City and one specimen registered in Hrishteni village during 2018 and August, 13th 2020; the species was reported and by Tuleshkov (1965) for Ayazmoto Park in Stara Zagora City.

***Acherontia atropos* (Linnaeus, 1758)**: two observations in Stara Zagora City during 90s.

***Macroglossum stellatarum* (Linnaeus, 1758)**: many observations in Stara Zagora City and Hrishteni village.

***Hyles euphorbiae* (Linnaeus, 1758)**: reported by Tuleshkov (1965) from Starozagorski Mineralni Bani Resort; loc. 1, 10.8.2020; loc. 11, 5.5.2019; 15.6.2019.

***Hyles livornica* (Esper, 1780)**: reported by Tuleshkov (1965) from Ayazmoto Park in Stara Zagora City; loc. 11, 5.5.2019.

***Deilephila elpenor* (Linnaeus, 1758)**: reported by Tuleshkov (1965) from Starozagorski Mineralni Bani Resort; loc. 11, 5.5.2019.

***Deilephila porcellus* (Linnaeus, 1758)**: reported by Tuleshkov (1965) from Starozagorski Mineralni Bani Resort; loc. 11, 5.5.2019; 15.6.2019.

Notodontidae

***Drymonia dodonaea trimacula* (Esper, 1785)**: reported by Tuleshkov (1965) from Starozagorski Mineralni Bani Resort; loc. 11, 5.5.2019.

***Drymonia ruficornis* (Hufnagel, 1766)**: reported by Tuleshkov (1965) from Ayazmoto Park in Stara Zagora City as *Drymonia chaonia* Hb.

***Drymonia velitaris* (Hufnagel, 1766)**: loc. 11, 15.6.2019, 1 male.

***Peridea anceps* (Goeze, 1781):** reported by Bocharov (1959) from Buzovgrad Village as *Notodonta trepida* Esp.

***Dicranura ulmi* (Denis & Schiffermüller, 1775): l**oc. 11, 5.5.2019.

***Spatalia argentina* (Denis & Schiffermüller, 1775)**: loc. 1, 1.5.2018; also reported by Tuleshkov (1965) from Starozagorski Mineralni Bani Resort.

Erebidae

Hypeninae

***Zekelita antiqualis* (Hübner, 1809)**: reported by Tuleshkov (1965) from Ayazmoto Park in Stara Zagora City; loc. 11, 15.6.2019.

***Hypena rostralis* (Linnaeus, 1758)**: loc. 1, 14.3.2018; loc. 11, 7.10.2020.

Lymantriinae

***Lymantria monacha* (Linnaeus, 1758)**: loc. 1, 12.7.2020.

***Lymantria dispar* (Linnaeus, 1758)**: loc. 1, 3.7.2018, 17.7.2020; also reported by Tuleshkov (1965) from Stara Zagora City.

***Calliteara pudibunda* (Linnaeus, 1758)**: reported by Tuleshkov (1965) from Starozagorski Mineralni Bani Resort.

***Penthophera morio* (Linnaeus, 1767)**: reported by Tuleshkov (1965) from Starozagorski Mineralni Bani Resort.

***Euproctis chrysorrhoea* (Linnaeus, 1758)**: loc. 8, 25.4.2020.

Arctiinae

***Lithosia quadra* (Linnaeus, 1758)**: loc. 1, 8.8.2018.

***Eilema caniola* (Hübner, 1808)**: loc. 1, 13.5.2018; loc. 11, 15.6.2019, 7.10.2020.

***Lithosia complana* (Linnaeus, 1758)**: reported by Tuleshkov (1965) from the hills above Stara Zagora City; loc. 11, 15.6.2019.

***Amata marjana* (Stauder, 1913)**: reported and by Tuleshkov (1965) for Ayazmoto Park in Stara Zagora City; loc. 11, 15.6.2019.

***Dysauxes famula* (Freyer, 1836)**: loc. 1, 23.8.2019, 05.6.2020; loc. 11, 15.6.2019.

***Phragmatobia fuliginosa* (Linnaeus, 1758)**: reported by Tuleshkov (1965) from the hills above Stara Zagora City.

***Epatolmis luctifera* (Denis & Schiffermüller, 1775)**: reported by Bocharov (1959) from Buzovgrad Village as *Arctinia caesarea* Goeze and by Tuleshkov (1965) from Starozagorski Mineralni Bani Resort.

***Spilosoma lubricipeda* (Linnaeus, 1758)**: loc. 1, 1.5.2018, 16.3.2019, 5.5.2019, 13.8.2020; also reported by Tuleshkov (1965) from Starozagorski Mineralni Bani Resort.

***Diaphora mendica* (Clerck, 1759)**: loc. 1, 18.4.2018 (1♂), 24.3.2019.

***Diacrisia purpurata* (Linnaeus, 1758)**: loc. 1, 11.4.2018, 1.6.2018, 14.6.2020; loc. 11, 15.6.2019.

***Ocnogyna parasita* (Hübner, 1790)**: loc. 1, 16.3.2019.

***Arctia villica* (Linnaeus, 1758)**: loc. 1, 8.5.2018, loc. 11, 5.5.2019.

Herminiinae

***Paracolax tristalis* (Fabricius, 1794)** (=*Herminia derivalis* Hübner 1796): reported by Tuleshkov (1965) from the fruit tree plantations of Ayazmoto Park in Stara Zagora City; Loc. 11, 15.6.2019.

***Herminia tarsipennalis* (Treitschke, 1835)**: reported by Bocharov (1959) from Buzovgrad Village.

***Pechipogo plumigeralis* Hübner, 1825**: loc. 1, 14.6.2020.

Toxocampinae

***Lygephila procax* (Hübner, 1813)**: (=*Ophiusa limosa* Treitschke, 1826): reported by Tuleshkov (1965) from Ayazmoto Hill in Stara Zagora City; Loc. 11, 5.5.2019.

***Lygephila viciae* (Hübner, 1822)**: loc. 1, 18.1.2019, 18.5.2019; loc. 4, 18-20.3.2018.

***Lygephila craccae* (Denis & Schiffermüller, 1775)**: reported by Tuleshkov (1965) from a *Cupressus* and *Cedrus* plantation at Ayazmoto Hill in Stara Zagora City; loc. 11, 15.6.2019, 7.10.2020.

***Autophila dilucida* (Hübner, 1808)**: reported by Bocharov (1959) from Buzovgrad Village. Missidentification with *Autophila limbata* (Staudinger, 1871) is possible.

Boletobiinae

***Phytometra viridaria* (Clerck, 1759)**: loc. 11, 15.6.2019.

***Eublemma purpurina* (Denis & Schiffermüller, 1775)**: loc. 1, 8.6.2018.

***Eublemma polygramma* (Duponchel, 1842)**: reported by Tuleshkov (1965) from Ayazmoto Park in Stara Zagora City; loc. 11, 15.6.2019.

Erebinae

***Euclidia glyphica* (Linnaeus, 1758)**: reported by Tuleshkov (1965) from the hills above Stara Zagora City.

***Euclidia triquetra* (Denis & Schiffermüller, 1775):** loc. 4, 05.6.2020.

***Minucia lunalis* (Denis & Schiffermüller, 1775)**: loc. 11, 5.5.2019; 15.6.2019.

***Dysgonia algira* (Linnaeus, 1767)**: loc. 11, 15.6.2019.

***Grammodes stolida* (Fabricius, 1775)**: loc. 1, 1.8.2018, 8.5.2018.

Eutelidae

***Eutelia adulatrix* (Hübner, 1813)**: loc. 1, 3.8.2020.

Noctuidae

Acontiinae

***Acontia lucida* (Hufnagel, 1767)**: loc. 1, 9.6.2018; also reported by Tuleshkov (1965) from Ayazmoto Park in Stara Zagora City.

***Acontia titania* (Esper, 1781)** (=*urania* Friv.): loc. 11, 15.6.2019, 1 female.

***Acontia trabealis* (Scopoli, 1763)**: reported by Tuleshkov (1965) in great numbers from the hills above Stara Zagora City; loc. 1, 13.5.2018, 1.6.2018 (Julian Georgiev leg.), 13-18.6.2018; loc. 11, 15.6.2019.

Plusiinae

***Abrostola triplasia* (Linnaeus, 1758)**: loc. 1, 1.5.2018.

***Chrysodeixis chalcites* (Esper, 1789)**: reported by Tuleshkov (1965) from Ayazmoto Park in Stara Zagora City; loc. 11, 7.10.2020.

***Macdunnoughia confusa* (Stephens, 1850)**: loc. 1, 26.4.2020; also reported by Tuleshkov (1965) from Ayazmoto Park in Stara Zagora City.

***Autographa gamma* (Linnaeus, 1758)**: reported by Tuleshkov (1965) from Ayazmoto Park in Stara Zagora City; loc. 11, 15.6.2019.

Pantheinae

***Colocasia coryli* (Linnaeus, 1758)**: reported by Tuleshkov (1965) from Starozagorski Mineralni Bani Resort.

Cuculliinae

***Shargacucullia gozmanyi* Ronkay, G. & Ronkay, L., 1994**: Loc. 11, 5.5.2019, 1 male.

Eustrotiinae

***Phyllophilla obliterata* (Rambur, 1833)**: loc. 11, 15.6.2019.

***Deltote pygarga* (Hufnagel, 1766)**: loc. 11, 5.5.2019.

Metoponiinae

***Apaustis rupicola* (Denis & Schiffermüller, 1775)**: reported by Bocharov (1959) from Buzovgrad Village.

Amphipyrinae

***Amphipyra pyramidea* (Linnaeus, 1758)**: loc. 1, 3.2.2019.

***Amphipyra tragopoginis* (Clerck, 1759)**: loc. 11, 15.6.2019, 7.10.2020.

***Allophyes oxyacanthae* (Linnaeus, 1758):** loc. 11, 7.10.2020.

***Asteroscopus sphinx* (Hufnagel, 1766)**: loc. 1, 15.1.2019.

***Asteroscopus syriaca decipulae* KOVACS, 1966**: reported by Beshkov (2000) from Stara Zagora City.

***Valeria oleagina* (Denis & , 1775)**: loc. 1, 14.3.2018, 7.3.2019.

***Meganephria bimaculosa* (Linnaeus, 1767)**: reported by Tuleshkov (1965) from Ayazmoto Park in Stara Zagora City; loc. 11, 7.10.2020.

Acronictinae

***Craniophora ligustri* (Denis & Schiffermüller, 1775)**: reported by Tuleshkov (1965) from a fruit tree plantation at Ayazmoto Hill in Stara Zagora City; Loc. 11, 5.5.2019.

***Acronicta megacephala* (Denis & Schiffermüller, 1775)**: reported by Tuleshkov (1965) from Starozagorski Mineralni Bani Resort.

***Acronicta euphorbiae* (Denis & Schiffermüller, 1775)**: loc. 11, 5.5.2019; 15.6.2019.

***Acronicta rumicis* (Linnaeus, 1758)**: loc. 1, 20.4.2018; also reported by Tuleshkov (1965) from Starozagorski Mineralni Bani Resort.

Oncocnemidinae

***Calophasia opalina* (Esper, 1793)**: reported by Tuleshkov (1965) from a pine tree plantation at Ayazmoto Hill in Stara Zagora City; loc. 11, 5.5.2019.

***Teinoptera olivina* (Herrich-Schäffer, 1852)**: reported by Bocharov (1959) from Buzovgrad Village; loc. 11, 5.5.2019; 15.6.2019.

Aediinae

***Aedia leucomelas* (Linnaeus, 1758)**: loc. 1, 9.5.2018, 12.5.2018, 13.5.2018, 3.6.2018, 19.8.2019, 26.8.2019, 18.9.2019; loc. 11, 7.10.2020.

***Tyta luctuosa* (Denis & Schiffermüller, 1775)**: Loc. 11, 15.6.2019.

Heliothinae

***Periphans delphinii* (Linnaeus, 1758)**: loc. 11, 15.6.2019.

***Heliothis peltigera* (Denis & Schiffermüller, 1775)**: reported by Tuleshkov (1965) from Ayazmoto Park in Stara Zagora City; loc. 11, 5.5.2019; 15.6.2019.

***Heliothis viriplaca* (Hufnagel, 1766)**: (=*dipsacea* L.): reported by Tuleshkov (1965) from Ayazmoto Park in Stara Zagora City; loc. 11, 5.5.2019.

***Heliothis incarnata* (Freyer, 1838)**: loc. 11, 15.6.2019.

***Helicoverpa armigera* (Hubner, 1808)**: reported by Tuleshkov (1965) from the hills above Stara Zagora City; loc. 11, 5.5.2019, 7.10.2020.

Bryophilinae

***Cryphia fraudatricula* (Hübner, 1803)**: reported by Bocharov (1959) from Buzovgrad Village.

***Bryophila rectilinea* (Warren, 1909)** (=*ravula* sensu auct.): reported by Tuleshkov (1965) from a fruit tree plantation at Ayazmoto Hill in Stara Zagora City; loc. 1: 31.8.2020, 17.9.2020. Specimens from loc. 1 are identified from picture, so misidentification or confusion with *Bryophila tephrocharis* (Boursin, 1954) seems possible.

Noctuinae

***Caradrina kadenii* (Freyer, 1836)**: reported by Tuleshkov (1965) from Ayazmoto Park in Stara Zagora City.

***Caradrina clavipalpis* (Scopoli, 1763)**: loc. 1, 3.8.2020; reported by Tuleshkov (1965) from Ayazmoto Park in Stara Zagora City.

***Hoplodrina ambigua* (Denis & Schiffermüller, 1775)**: reported by Tuleshkov (1965) from Ayazmoto Park in Stara Zagora City; loc. 11, 15.6.2019, 7.10.2020.

***Charanyca trigrammica* (Hufnagel, 1766)**: loc. 11, 5.5.2019.

***Dypterygia scabriuscula* (Linnaeus, 1758)**: reported by Tuleshkov (1965) from the hills above Stara Zagora City.

***Trachea atriplicis* (Linnaeus, 1758)**: reported by Tuleshkov (1965) from Starozagorski Mineralni Bani Resort and from the hills above Stara Zagora City.

***Thaupophila matura* (Hufnagel, 1766):** loc. 11, 7.10.2020.

***Chloantha hyperici* (Denis & Schiffermüller, 1775)**: loc. 11, 5.5.2019; 15.6.2019.

***Phlogophora meticulosa* (Linnaeus, 1758)**: reported by Tuleshkov (1965) from a fruit tree plantation at Ayazmoto Hill in Stara Zagora City; loc. 1: 17.9.2020; loc. 11, 7.10.2020.

***Eremobia ochroleuca* (Denis & , 1775)**: reported by Tuleshkov (1965) from a fruit tree plantation at Ayazmoto Hill in Stara Zagora City. More likely this report concerns *Eremobia asiatica* Draudt, 1936.

***Gortyna moesiaca* Herrich-Schäffer, 1849**: loc. 11, 7.10.2020, 1 male (fig. 4). This finding supports our opinion that *Gortyna borelii* is reported instead of *G. moesiaca* (see under *Gortyna borelii*).

***Gortyna borelii* (Pierret, 1837)**: reported by Tuleshkov (1965) as "*Hydroecia leucographa* BKH. var. *borelii* Pierret" from Stara Zagora City. This report seems to be a result of misidentification and concerns another species, not this one.

***Luperina testacea* ([Denis & Schiffermüller], 1775)**: reported by Bocharov (1959) from Buzovgrad Village as *Apamea testacea* Hb. from 08.VI.1948. Taking into account the flight period of the species (end of July-October), these cannot be *Luperina testacea*, or the collecting date is wrongly given. In the collection of Bocharov in National

Museum of Natural History, Sofia all specimens determined as *Luperina testacea* are *Luperina rubella*, but the flight period in June also do not fits for this species.

***Luperina rubella* (Duponchel, 1835):** loc. 11, 7.10.2020.

***Rhizedra lutosa* (Hübner, [1803])**: loc. 11, 7.10.2020.

***Mesapamea secalis* (Linnaeus, 1758)**: reported by Tuleshkov (1965) from the fruit tree plantations and vineyards on the hills above Stara Zagora City. This report may concern also *Mesapamea secalella* Remm, 1983.

***Oligia latruncula* (Denis & Schiffermüller, 1775)**: reported by Tuleshkov (1965) from the fruit tree plantations and vineyards on the hills above Stara Zagora City. This report may concern another species: *Oligia versicolor* (Borkhausen, 1792).

***Episema glaucina* (Esper, 1789)**: reported by Tuleshkov (1965) from a fruit tree plantation at Ayazmoto Hill in Stara Zagora City; loc. 11, 7.10.2020.

***Episema tersa* (Denis & Schiffermüller, 1775)**: loc. 11, 7.10.2020.

***Tiliacea sulphurago* (Denis & Schiffermüller, 1775)**: loc. 11, 7.10.2020.

***Cirrhia icteritia* (Hufnagel, 1766)** (=*fulvago* sensu auct.): reported by Tuleshkov (1965) from the hills above Stara Zagora City.

***Agrochola lychnidis* (Denis & Schiffermüller, 1775)**: reported by Tuleshkov (1965) from Ayazmoto Hill in Stara Zagora City.

***Anchoscelis nitida* (Denis & , 1775)**: loc. 11, 7.10.2020.

***Anchoscelis litura* (Linnaeus, 1758)**: loc. 11, 7.10.2020, 5 males and 3 females, genitalia of males checked.

***Anchoscelis humilis* (Denis & , 1775)**: reported by Tuleshkov (1965) from the hills above Stara Zagora City.

***Sunira circellaris* (Hufnagel, 1766):** loc. 11, 7.10.2020.

***Propenista laevis* (Hübner, 1803):** loc. 11, 7.10.2020.

***Conistra vaccinii* (Linnaeus, 1761)**: loc. 11, 7.10.2020, 1 female, genitalia checked.

***Conistra rubiginosa* (Scopoli, 1763)**: loc. 1, 16.3.2018.

***Conistra veronicae* (Hübner, 1813)**: loc. 1, 6.3.2019.

***Lithophane ornitopus* (Hufnagel, 1766)**: loc. 1, 8.3.2019.

***Xylena exsoleta* (Linnaeus, 1758)**: loc 1, 12.2.2019.

***Cosmia trapezina* (Linnaeus, 1758)**: loc. 11, 15.6.2019.

***Dycicla oo* (Linnaeus, 1758)**: loc. 11, 15.6.2019.

***Atethmia centrago* (Haworth, 1809)** (=*xerampelina* sensu auct.): reported by Tuleshkov (1965) from a fruit tree plantation at Ayazmoto Hill in Stara Zagora City.

***Mesogona acetosellae* (Denis & , 1775)**: reported by Tuleshkov (1965) from Ayazmoto Park in Stara Zagora City; loc. 11, 7.10.2020.

***Ammoconia senex* (Geyer, 1828)**: reported by Tuleshkov (1965) from Ayazmoto Hill in Stara Zagora City.

***Ammoconia caecimacula* ([Denis & Schiffermüller], 1775):** loc. 11, 7.10.2020.

***Aporophyla australis* (Boisduval, 1829):** loc. 11, 7.10.2020.

***Aporophyla canescens* (Duponchel, 1826):** loc. 11, 7.10.2020.

***Orthosia gothica* (Linnaeus, 1758)**: loc. 1, 17.3.2018, 18.5.2019.

***Perigrapha rorida* (Frivaldszky, 1835)**: loc. 4, 18-20.3.2018; loc. 1, 16.3.2019.

***Egira conspicillaris* (Linnaeus, 1758)**: reported by Tuleshkov (1965) from Starozagorski Mineralni Bani Resort; loc. 11, 5.5.2019, 5 males, genitalia with everted vesica checked, in glycerol in microvials.

***Egira tibori* Hreblay, 1994**: loc. 11, 5.5.2019, 1 male, genitalia with everted vesica checked, in glycerol in microvials.

***Tholera decimalis* (Poda, 1761)**: reported by Tuleshkov (1965) from a fruit tree plantation at Ayazmoto Hill in Stara Zagora City; loc. 11, 7.10.2020.

***Anarta trifolii* (Hufnagel, 1766)**: reported by Tuleshkov (1965) from the hills north-east of Stara Zagora City; loc. 11, 5.5.2019; 15.6.2019.

***Pachetra sagittigera* (Hufnagel, 1766)**: reported by Tuleshkov (1965) from Starozagorski Mineralni Bani Resort; loc. 11, 5.5.2019.

***Lacanobia w-latinum* (Hufnagel, 1766)** (=*Mamestra genistae* (Borkhausen, 1792): reported by Tuleshkov (1965) from Starozagorski Mineralni Bani Resort, near the river in gardens; loc. 11, 5.5.2019; 15.6.2019.

***Lacanobia thalassina* (Hufnagel, 1766)**: reported by Tuleshkov (1965) from Starozagorski Mineralni Bani Resort.

***Mamestra oleracea* (Linnaeus, 1758)**: reported by Tuleshkov (1965) from Starozagorski Mineralni Bani Resort.

***Hada plebeja* (Linnaeus, 1761)** (=*Mamestra dentina* (Denis & Schiffermüller, 1775): reported by Tuleshkov (1965) from the hills above Stara Zagora City.

***Mamestra brassicae* (Linnaeus, 1758)**: reported for Stara Zagora City by Nedyalkov (1909) and Tuleshkov (1965).

***Hecatera dysodea* (Denis & Schiffermüller, 1775)**: loc. 1, 24.5.2018.

***Hecatera bicolorata* (Hufnagel, 1766)**: loc. 11, 5.5.2019.

***Hadena magnolii* (Boisduval, 1829)**: loc. 11, 5.5.2019; 15.6.2019.

***Hadena confusa* (Hufnagel, 1766)**: loc. 11, 5.5.2019.

***Hadena perplexa* (Denis & Schiffermüller, 1775)**: loc. 11, 5.5.2019.

***Hadena syriaca podolica* (Kremky, 1937)**: loc. 11, 15.6.2019, 1 male.

***Mythimna pallens* (Linnaeus, 1758)**: reported by Tuleshkov (1965) from fruit tree plantation at Ayazmoto Hill in Stara Zagora City.

***Mythimna vitellina* (Hübner, 1808)**: reported by Tuleshkov (1965) from the hills above Stara Zagora City; loc. 11, 5.5.2019.

***Mythimna unipuncta* (Haworth, 1809):** loc. 11, 7.10.2020.

***Mythimna albipuncta* (Denis & , 1775)**: reported by Tuleshkov (1965) from a fruit tree plantation at Ayazmoto Hill in Stara Zagora City; loc. 11, 5.5.2019, 7.10.2020.

***Mythimna l-album* (Linnaeus, 1767)**: reported by Tuleshkov (1965) from the hills above Stara Zagora City; loc. 11, 7.10.2020.

***Leucania comma* (Linnaeus, 1761)**: loc. 1, 18.5.2019.

***Peridroma saucia* (Hübner, 1808)**: reported by Tuleshkov (1965) from Ayazmoto Park in Stara Zagora City.

***Dichagyris flavina* (Herrich-Schäffer, 1852)**: reported by Bocharov (1959) from Buzovgrad Village.

***Dychagiris nigrescens* (Höfner, 1888)**: loc. 11, 15.6.2019.

***Dychagyris forcipula* (Denis & , 1775)**: loc. 11, 15.6.2019.

***Euxoa temera* (Hübner, 1808)**: reported by Tuleshkov (1965) from the hills above Stara Zagora City.

***Euxoa aquilina* (Denis & , 1775)**: reported by Tuleshkov (1965) from Ayazmoto Hill in Stara Zagora City.

***Euxoa hastifera* (Donzel, 1847)**: reported by Tuleshkov (1965) from Ayazmoto Park in Stara Zagora City.

***Agrotis exclamationis* (Linnaeus, 1758)**: reported by Tuleshkov (1965) from Starozagorski Mineralni Bani Resort; loc. 11, 5.5.2019; 15.6.2019

***Agrotis segetum* (Denis & Schiffermüller, 1775)**: loc. 1, 13.5.2018, 3.7.2019, 9.7.2019, 29.8.2019, 17.9.2019; loc. 11, 5.5.2019, 7.10.2020. Also reported by Tuleshkov (1965) from Stara Zagora City.

***Agrotis clavis* (Hufnagel, 1766)** (=*corticea* (Denis & Schiffermüller, 1775): reported by Tuleshkov (1965) from the hills above Stara Zagora City.

***Agrotis ipsilon* (Hufnagel, 1766):** loc. 11, 15.6.2019.

***Axylia putris* (Linnaeus, 1761)**: reported by Tuleshkov (1965) from Starozagorski Mineralni Bani Resort.

***Ochropleura plecta* (Linnaeus, 1761)**: loc. 11, 5.5.2019.

***Ochropleura leucogaster* (Freyer, 1831)**: reported by Tuleshkov (1965) from the hills above Stara Zagora City.

***Noctua pronuba* (Linnaeus, 1758)**: loc. 1, 05.6.2020; loc. 11, 7.10.2020. Reported by Tuleshkov (1965) from the hills north-east of Stara Zagora City.

***Noctua comes* Hübner, 1813**: loc. 11, 15.6.2019, 7.10.2020.

***Noctua interjecta* Hübner, [1803]**: loc. 11, 7.10.2020.

***Noctua tertia* von Mentzer, Moberg & Fibiger, 1991:** loc. 11, 7.10.2020.

***Epilecta linogrisea* (Denis & Schiffermüller, 1775)**: loc. 11, 7.10.2020.

***Xestia castanea* (Esper, 1798)**: reported by Tuleshkov (1965) from a fruit tree plantation at Ayazmoto Hill in Stara Zagora City.

***Xestia xanthographa* (Denis & Schiffermüller, 1775)**: loc. 11, 7.10.2020.

***Xestia cohaesa* (Herrich-Schäffer, 1849)**: loc. 11, 7.10.2020.

***Xestia c-nigrum* (Linnaeus, 1758)**: reported by Tuleshkov (1965) from Starozagorski Mineralni Bani Resort.

***Spaelotis ravida* (Denis & Schiffermüller, 1775)**: reported by Tuleshkov (1965) from Stara Zagora City.

Nolidae

Nolinae

***Nola chlamitulalis* (Hübner, 1813)**: loc 1, 3.9.2019

Chloephorinae

***Nycteola revayana* (Scopoli, 1772)**: reported by Tuleshkov (1965) from the hills above Stara Zagora City.

Figs 1, 2. *Mirificarma maculatella* (Hübner, 1796), males. Loc. 11, 15.6.2019. New record for the Bulgarian fauna.

Fig. 3. *Idaea dilutaria* (Hübner, 1799), male genitalia. Loc. 11, 15.6.2019, Gen. prep. 3./04.V.2020, S. Beshkov.

Fig. 4. *Gortyna moesiaca* Herrich-Schäffer, 1849, male. Loc. 11, 7.10.2020 (Scale = 1 cm).

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Georgiev, D., Bechev, D. & Yancheva, V. (Eds.)
Fauna of Sarnena Sredna Gora Mts, Part 1
ZooNotes, Supplement 9, 2020

Longhorn beetles (Coleoptera: Cerambycidae) in Sarnena Sredna Gora Mountains

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Abstract. The available data on the distribution of Cerambycidae species from Sarnena Gora Mts. are summarized. A total of 98 species of the family are reported. Of these 55 are new for the study area and for 82 species new locality records are presented. Findings of the species *Stenurella melanura samai* Rapuzzi, 1995, *Leiopus linnei* Wallin, Nylander & Kvamme, 2009, *Agapanthia osmanlis* Reiche et Saulcy, 1858, *Phytoecia millefolii* (Adams, 1817), *Pogonocherus hispidus* (Linnaeus, 1758) and *P. perroudi* Mulsant, 1839 are of particular importance in terms of their distribution in Bulgaria. The species *Rosalia alpina alpina* (Linnaeus, 1758) and *Morimus asper funereus* Mulsant, 1863 are included in the Directive 92/43/EEC on the conservation of natural habitats and wild fauna and flora.

Key words: Cerambycidae, Bulgaria, Sarnena Sredna Gora.

Introduction

The purpose of the present study is to conclude a list of the species from the family Cerambycidae (Coleoptera) from Sarnena Sredna Gora based on literature data, museum collections material and recently collected material. Data on the distribution of 43 species from the study area are available in the publications of Joakimov (1904), Nedelkov (1909a), Kantardjiewa-Minkowa (1932, 1934), Kantardjieva-Minkova (1957), Angelov (1964), Ganev (1985), Doychev & Georgiev (2004) and Georgiev (2020). Species records from neighboring localities (e.g. „Stara Zagora", „Chirpan", „Kazanlak" and „Karlovo") in the publications of Nedelkov (1905, 1909b), Netolitzky (1912), Heyrovský (1931), Minkova (1961), Ganev (1986), Dascălu & Fusu (2012), Doychev *et al.* (2017) are not included in the species list.

Material and Methods

Material for the present study was collected by the authors from April to July 2018 from localities in the higher Western part of Sarnena Sredna Gora (Bratan Region) mainly by direct collection from plants. Part of the specimens were collected by the authors with propylene glycol pitfall traps during the same period. Material collected by Dilian Georgiev from Hrishteni Vill. and the neighboring localities in the period 2016-2018, as well as material from pitfall traps, collected by Teodora Teofilova and Nikolay Kodzhabashev from Bratan Peak area and Chirpan Heights in the period 2019-2020 was also included. The specimens of Cerambycidae, preserved in the Coleoptera collection of the National Museum of Natural History (Sofia, Bulgaria) were revised.

The identification of the material was performed by the first author. The systematic of Cerambycidae, used in the preparation of the list, is according Danilevsky (2019a).

The collector's names abbreviations are as follows: DGr – Denis Gradinarov; YP – Yana Petrova; IGr – Iliya Gradinarov; DGe – Dilian Georgiev; TT – Teodora Teofilova; NK – Nikolay Kodzhabashev; ECh – Evgeni Chehlarov. The other abbreviations are as follows: ex.

– specimen/s; rev. – revised material by D. Gradinarov; p/f – collected on plants/flowers; BFUS – Zoological Collection of Sofia University "St. Kliment Ohridski", Faculty of Biology, Sofia, Bulgaria; NMNHS – collection of National Museum of Natural History, Sofia, Bulgaria; * – the species is new for the studied area; **#** – the species is doubtful for the studied area.

Results

List of species

Cerambycidae Latreille, 1802
Prioninae Blanchard, 1845
Aegosomatini J. Thomson, 1861

***Aegosoma scabricorne* (Scopoli, 1763)**

Turia Vill. (Joakimov 1904: 31, Kantardjiewa-Minkowa 1932: 81, as *Megopis* (*Aegosoma*) *scabricornis* Scop.); rev.: Turia [in Cyrillic]/10.viii.1906/Col. D. Ioakimov, 1 ♂ (NMNHS).

New data: Hrishteni Vill., 42°27.212'N 25°42.315'E, 230 m a.s.l., yard of a house, 21.vi.2018, 1 ♂, on lamp, DGe leg. (BFUS).

Prionini Latreille, 1802

***Prionus coriarius* (Linnaeus, 1758)**

Sredna Gora/S of Turia Vill. (Joakimov 1904: 31); Bratan Peak (Kantardjiewa-Minkowa 1932: 82).

New data: S Osetenovo Vill., bank of Turiyska Reka River, 42°32.717'N 25°02.533'E, 670 m a.s.l., riverside meadow with oak and willow, 07.vii. - 11.xi.2019, 2 ♂♂, pitfall trap, TT & NK leg. (BFUS).

Lepturinae Latreille, 1802
Lepturini Latreille, 1802

***Alosterna tabacicolor tabacicolor* (De Geer, 1775)**

New data: 1 km SE Svezhen Vill., 42°29.377'N 25°02.429'E, 793 m a.s.l., meadows, 23.v.2018, 1 ♂, p/f, YP & DGr leg. (BFUS); 5 km SE Turia Vill., 42°31.786'N 25°11.763'E, 565 m a.s.l., riverside meadows and roadside verges, 24.v.2018, 3 ♂♂, 4 ♀♀, p/f, DGr & YP leg. (BFUS); Svezhen Vill., 42°30.292'N 25°01.540'E, 747 m a.s.l., riverside vegetation, 24.v.2018, 1 ♂, 1 ♀, p/f, DGr leg. (BFUS).

***Anastrangalia dubia dubia* (Scopoli, 1763)**

Sredna Gora/S of Turia Vill. (Joakimov 1904: 32, as *Leptura dubia* L.).

New data: 1 km SW Turia Vill., 42°33.862'N 25°10.386'E, 480 m a.s.l., meadows and roadside verges, 24.v.2018, 1 ♀, p/f, DGr & YP leg. (BFUS); NW Svezhen Vill., 42°30.649'N 25°00.641'E, 749 m a.s.l., edge of a beech-oak forest, 25.v.2018, 1 ♀, p/f, YP leg. (BFUS).

***Anoplodera (Anoplodera) sexguttata* (Fabricius, 1775)**

New data: 2 km NE Mrachenik Vill., 42°30.260'N 24°59.074'E, 717 m a.s.l., roadside meadows and shrubs, 24.v.2018, 1 ♂, p/f, DGr leg. (BFUS); Beter Peak area, N of Zmeyovo Vill., 42°30.570'N 25°37.493'E 705 m a.s.l., dirt road, mixed forest with glades, 28.v.2018, 1 ♀, DGe leg. (BFUS).

***Leptura (Leptura) quadrifasciata quadrifasciata* Linnaeus, 1758**

New data: Svezhen Vill., 42°30.292'N 25°01.540'E, 747 m a.s.l., riverside vegetation, 23.vi.2018, 1 ♂, p/f, DGr leg. (BFUS).

***Pachytodes cerambyciformis* (Schrank, 1781)**

New data: 1 km SE Svezhen Vill., 42°29.423'N 25°02.509'E, 810 m a.s.l., meadows, 23.v.2018, 1 ♂, p/f, DGr leg. (BFUS); 2 km NE Mrachenik Vill., 42°30.260'N 24°59.074'E, 717 m a.s.l., roadside meadows and shrubs, 24.v.2018, 1 ♂, 1 ♀, p/f, YP & DGr leg. (BFUS) (**Plate I, 1**); Svezhen Vill., 42°30.292'N 25°01.540'E, 747 m a.s.l., riverside vegetation, 24.v.2018, 1 ♀, p/f, DGr leg. (BFUS); Beter Peak area, N of Zmeyovo Vill., 42°30.570'N 25°37.493'E, 705 m a.s.l., dirt road, mixed forest with glades, 28.v.2018, 1 ♂, DGe leg. (BFUS); Svezhen Vill., 42°30.292'N 25°01.540'E, 747 m a.s.l., riverside vegetation, 23.vi.2018, 1 ♂, p/f, DGr leg. (BFUS); near Kavakliyka Chalet, 42°29.123'N 25°13.411'E, 975 m a.s.l., meadows, 24.vi.2018, 3 ♂♂, 1 ♀, p/f, DGr & YP leg. (BFUS).

***Pachytodes erraticus* (Dalman, 1817)**

Sredna Gora/S of Turia Vill. (Joakimov 1904: 31, as *Pachyta erratica* Dalm.); Buzovgrad Vill. (Ganev 1985: 149, as *Judolia erratica* Dal.).

New data: 5 km SW Chehlare Vill., 42°24.707'N 25°06.158'E, 431 m a.s.l., roadside vegetation, 23.vi.2018, 4 ♂♂, 1 ♀, p/f, YP & DGr leg. (BFUS); 1 km NW Babek Vill., 42°27.184'N 25°04.127'E, 469 m a.s.l., meadows and roadside verges, 23.vi.2018, 12 ♂♂, 5 ♀♀, p/f, DGr & YP leg. (BFUS); 3,5 km NW Babek Vill., 42°28.461'N 25°03.852'E, 696 m a.s.l., roadside vegetation, cutting area, 23.vi.2018, 2 ♂♂, 2 ♀♀, p/f, YP leg. (BFUS); 2 km NE Mrachenik Vill., 42°30.260'N 24°59.074'E, 717 m a.s.l., roadside meadows and shrubs, 23.vi.2018, 7 ♂♂, 7 ♀♀, p/f, YP & DGr leg. (BFUS) (**Plate I, 2**); NW Svezhen Vill., 42°30.649'N 25°00.641'E, 749 m a.s.l., meadows and shrubs next to a beech-oak forest, 23.vi.2018, 2 ♂♂, 1 ♀, p/f, YP leg. (BFUS); 3 km SE Svezhen Vill., 42°28.875'N 25°03.264'E, 763 m a.s.l., meadows and roadside verges, 23.vi.2018 - 24.vi.2018, 3 ♂♂, 9 ♀♀, p/f, DGr & YP leg. (BFUS); 1 km NW Dolno Novo Selo Vill., 42°25.911'N 25°13.826'E, 435 m a.s.l., meadows, 24.vi.2018, 1 ♂, p/f, DGr leg. (BFUS); 1 km SW Turia Vill., 42°33.829'N 25°10.442'E, 488 m a.s.l., hillside, meadows, 24.vi.2018, 2 ♂♂, p/f, DGr & YP leg. (BFUS); the same locality and date, but 1 ♂, 1 ♀, p/f, YP & leg. (BFUS); 5 km SE Turia Vill., 42°31.786'N 25°11.763'E, 565 m a.s.l., riverside meadows and roadside verges, 24.vi.2018, 1 ♀, p/f, DGr & YP leg. (BFUS); 3 km NW Gorno Novo Selo Vill., near Kaleto Place, 42°28.430'N 25°13.294'E, 808 m a.s.l., meadows and roadside verges, 24.vi.2018, 13 ♂♂, 7 ♀♀, p/f, YP leg. (BFUS); 1 km SE Svezhen Vill., 42°29.242'N 25°02.469'E, 819 m a.s.l., meadows and roadside verges, 24.vi.2018, 1 ♂, 2 ♀♀, p/f, DGr & YP leg. (BFUS).

***Pseudovadonia livida setosa* Danilevsky, 2013**

New data: SE Beguntsi Vill., near Byala Reka Riv., 42°32.601'N 24°53.247'E, 321 m a.s.l., riverside meadows, 23.v.2018, 3 ♂♂, 1 ♀, p/f, DGr & YP leg. (BFUS); near Stara Zagora, N of Dabrava quarter, 42°27.505'N 25°35.617'E, 520 m a.s.l., oak-hornbeam forest, 23.v.2018, 1 ♂, DGe leg. (BFUS); near Zelenikovo Vill., 42°24.969'N 25°04.815'E, 330 m a.s.l., roadside verges, 24.v.2018, 2 ♂♂, p/f, YP leg. (BFUS); 1 km SW Turia Vill., 42°33.862'N 25°10.386'E, 480 m a.s.l., meadows and roadside verges, 24.v.2018, 1 ♂, 2 ♀♀, p/f, YP & DGr leg. (BFUS); 1,5 km NW Babek Vill., 42°27.384'N 25°04.172'E, 512 m a.s.l., meadows, 24.v.2018, 14 ♂♂, 11 ♀♀, p/f, DGr & IGr leg. (BFUS); the same locality, but 23.vi.2018, 1 ♀, p/f, DGr leg. (BFUS); 2 km NE Mrachenik Vill., 42°30.260'N 24°59.074'E, 717 m a.s.l., roadside meadows and shrubs, 24.v.2018, 1 ♂, 1 ♀, p/f, YP & DGr leg. (BFUS); the same locality and date, but 1 ♂, p/f, YP & IGr leg. (BFUS); 3 km NE Mrachenik Vill., 42°30.102'N 24°59.900'E, 805 m a.s.l., roadside verges and an oak forest, 24.v.2018, 1 ♂, 2 ♀♀, p/f, YP leg. (BFUS); W of Stara Zagora, 42°24.547'N 25°33.442'E, 390 m a.s.l., meadows and shrubs, 04.vi.2018, 1 ♂, DGe leg. (BFUS); 1 km NW Babek Vill., 42°27.184'N 25°04.127'E, 469 m a.s.l., meadows and roadside verges, 23.vi.2018, 3 ♂♂, 2 ♀♀, p/f, DGr & YP leg. (BFUS); 1 km SE Gorno Novo Selo Vill., 42°26.532'N 25°13.573'E, 468 m a.s.l.,

roadside vegetation, 24.vi.2018, 4 ♂♂, 1 ♀, p/f, YP leg. (BFUS); near Rozovets Vill., bank of Stara Reka Riv., 42°27.685'N 25°07.232'E, 469 m a.s.l., riverside vegetation, 24.vi.2018, 1 ♂, p/f, DGr leg. (BFUS); near Kavakliyka Chalet, 42°29.123'N 25°13.411'E, 975 m a.s.l., meadows, 24.vi.2018, 1 ♀, p/f, DGr & YP leg. (BFUS).

***Rutpela maculata maculata* (Poda von Neuhaus, 1761)**

Sredna Gora/S of Turia Vill. (Joakimov 1904: 32, as *Strangalia maculata* Poda); Turia Vill. (Kantardjiewa-Minkowa 1932: 91, as *Strangalia maculata* Poda); rev.: Turia Vill. [in Cyrillic]/1919/ex collectio/D. Joakimov/Bulgarien, 1 ♀ (NMNHS).

New data: Beter Peak area, N of Zmeyovo Vill., 42°30.570'N 25°37.493'E, 705 m a.s.l., dirt road, mixed forest with glades, 28.v.2018, 1 ♀, DGe leg. (BFUS); Beter Peak, 42°30.687'N 25°37.773'E, 809 m a.s.l., deciduous forest with *Quercus* sp., *Carpinus betulus* L., *Acer* sp., rocks and forest glades with *Paeonia* sp., 28.v.2018, 1 ♀, DGe leg. (BFUS); on the road to Moruley Peak, 42°31.462'N 25°45.530'E, 620 m a.s.l., oak-hornbeam forest, forest glades, 07.vi.2018, 1 ♂, DGe leg. (BFUS); 3,5 km NW Babek Vill., 42°28.461'N 25°03.852'E, 696 m a.s.l., roadside vegetation, cutting area, 23.vi.2018, 2 ♂♂, 3 ♀♀, p/f, YP leg. (BFUS); 3 km SE Svezhen Vill., 42°28.875'N 25°03.264'E, 763 m a.s.l., meadows and roadside verges, 23.vi.2018 - 24.vi.2018, 2 ♂♂, 3 ♀♀, p/f, DGr & YP leg. (BFUS); 5 km SE Turia Vill., 42°31.786'N 25°11.763'E, 565 m a.s.l., riverside meadows and roadside verges, 24.vi.2018, 1 ♂, p/f, DGr & YP leg. (BFUS); near Kavakliyka Chalet, 42°29.123'N 25°13.411'E, 975 m a.s.l., meadows, 24.vi.2018, 3 ♂♂, p/f, DGr & YP leg. (BFUS); the same locality, but 22.vii.2018, 1 ♂, 1 ♀, p/f, DGr & YP leg. (BFUS); 3 km NW Gorno Novo Selo Vill., near Kaleto Place, 42°28.430'N 25°13.294'E, 808 m a.s.l., meadows and roadside verges, 22.vii.2018, 1 ♂, p/f, YP leg. (BFUS).

****Stenurella (Nigrostenurella) nigra nigra* (Linnaeus, 1758)**

New data: N of Kolena Vill., 42°29.340'N 25°43.220'E, 290 m a.s.l., riverine forest, forest glades, 23.v.2017, 1 ♂, DGe leg. (BFUS); near Starozagorski Bani Vill., 42°26.900'N 25°29.562'E, 390 m a.s.l., high grass vegetation, 10.v.2018, 1 ♂, DGe leg. (BFUS); S of Shanovo Vill., 42°31.867'N 25°38.698'E, 434 m a.s.l., oak-hornbeam forest, 15.v.2018, 1 ♀, DGe leg. (BFUS); 1 km SE Svezhen Vill., 42°29.377'N 25°02.429'E, 793 m a.s.l., meadows, 23.v.2018, 1 ♂, 1 ♀, p/f, YP & DGr leg. (BFUS); 3 km S Turia Vill., 42°32.601'N 25°10.937'E, 538 m a.s.l., hillside, meadows, roadside verges, 24.v.2018, 1 ♀, p/f, DGr & YP leg. (BFUS); 2 km NE Mrachenik Vill., 42°30.260'N 24°59.074'E, 717 m a.s.l., roadside meadows and shrubs, 24.v.2018, 8 ♂♂, p/f, DGr, YP & IGr leg. (BFUS) (**Plate I, 3**); Svezhen Vill., 42°30.292'N 25°01.540'E, 747 m a.s.l., riverside vegetation, 24.v.2018, 1 ♂, p/f, DGr leg. (BFUS); 3 km NE Mrachenik Vill., 42°30.102'N 24°59.900'E, 805 m a.s.l., roadside verges and an oak forest, 24.v.2018, 2 ♂♂, p/f, YP leg. (BFUS); NW Svezhen Vill., 42°30.649'N 25°00.641'E, 749 m a.s.l., edge of a beech-oak forest, 25.v.2018, 1 ♀, p/f, YP leg. (BFUS); on the road to Moruley Peak, 42°31.462'N 25°45.530'E, 620 m a.s.l., oak-hornbeam forest, forest glades, 07.vi.2018, 1 ♀, DGe leg. (BFUS); Svezhen Vill., 42°30.292'N 25°01.540'E, 747 m a.s.l., riverside vegetation, 23.vi.2018, 1 ♀, p/f, DGr leg. (BFUS).

***Stenurella (Priscostenurella) bifasciata bifasciata* (O. F. Müller, 1776)**

Sredna Gora/S of Turia Vill. (Joakimov 1904: 32, as *Leptura bifasciata* Mull.).

New data: SE Beguntsi Vill., near Byala Reka Riv., 42°32.601'N 24°53.247'E, 321 m a.s.l., riverside meadows, 23.v.2018, 5 ♂♂, 4 ♀♀, p/f, DGr & YP leg. (BFUS); 5 km SW Chehlare Vill., 42°24.708'N 25°06.145'E, 429 m a.s.l., roadside vegetation, 24.v.2018, 1 ♀, p/f, YP leg. (BFUS); 1 km SW Turia Vill., 42°33.862'N 25°10.386'E, 480 m a.s.l., meadows and roadside verges, 24.v.2018, 1 ♀, p/f, DGr & YP leg. (BFUS); 2 km NE Mrachenik Vill., 42°30.260'N 24°59.074'E, 717 m a.s.l., roadside meadows and shrubs, 24.v.2018, 5 ♂♂, 5

♀♀, p/f, YP & DGr leg. (BFUS); NW Svezhen Vill., 42°30.616'N 25°00.680'E, 746 m a.s.l., edge of a beech-oak forest, 25.v. - 23.vi.2018, 1 ♀, pitfall trap, DGr & YP leg. (BFUS); 5 km SW Chehlare Vill., 42°24.707'N 25°06.158'E, 431 m a.s.l., roadside vegetation, 23.vi.2018, 1 ♀, p/f, YP & DGr leg. (BFUS); 4,5 km SW Chehlare Vill., 42°24.744'N 25°06.337'E, 450 m a.s.l., dirt road, meadows, 23.vi.2018, 1 ♂, p/f, DGr & YP leg. (BFUS); 3,5 km NW Babek Vill., 42°28.461'N 25°03.852'E, 696 m a.s.l., roadside vegetation, cutting area, 23.vi.2018, 2 ♀♀, p/f, YP & DGr leg. (BFUS); 3 km SE Svezhen Vill., 42°28.875'N 25°03.264'E, 763 m a.s.l., meadows and roadside verges, 23.vi.2018 - 24.vi.2018, 1 ♂, 2 ♀♀, p/f, DGr & YP leg. (BFUS); 1 km SW Turia Vill., 42°33.829'N 25°10.442'E, 488 m a.s.l., hillside, meadows, 24.vi.2018, 6 ♂♂, 10 ♀♀, p/f, DGr, YP & IGr leg. (BFUS) (**Plate I, 4**); W of Yagoda Vill., 42°32.347'N 25°33.578'E, 315 m a.s.l., streamside meadows with shrub and tree vegetation, 02.vii.2018, 1 ♂, DGe leg. (BFUS); Chirpan heights, NW Veren Vill., 42°21.317'N 25°10.783'E, 353 m a.s.l., abandoned pasture with *Paliurus spina-christi* Mill. and *Opuntia* sp., 23.iii. - 08.vii.2019, 1 ♀, pitfall trap, TT & NK leg. (BFUS).

Notes: The contact zone between two of the subspecies of *S. bifasciata* – the nominative *S. bifasciata* spp. *bifasciata* (O. F. Müller, 1776) and the southern *S. bifasciata* ssp. *intermedia* Holzschuh, 2006 passes through the northern part of the Balkan Peninsula (Danilevsky 2014). Both subspecies have been reported from Bulgaria – the nominative subspecies from Sofia environs and *S. bifasciata* ssp. *intermedia* from the south parts of the country (Danilevsky 2011, 2014, Georgiev *et al.* 2019). All examined females (28 specimens) from Sarnena Gora have the characteristic for the nominative subspecies well developed black elytral design.

***Stenurella (Priscostenurella) septempunctata septempunctata* (Fabricius, 1792)**

New data: SE Beguntsi Vill., near Byala Reka Riv., 42°32.601'N 24°53.247'E, 321 m a.s.l., riverside meadows, 23.v.2018, 2 ♂♂, 1 ♀, p/f, DGr & YP leg. (BFUS); 2,5 km SE Domlyan Vill., 42°30.809'N 24°55.328'E, 450 m a.s.l., roadside verges, 23.v.2018, 2 ♂♂, 2 ♀♀, p/f, YP leg. (BFUS); near Zelenikovo Vill., 42°24.969'N 25°04.815'E, 330 m a.s.l., roadside verges, 24.v.2018, 1 ♂, p/f, YP leg. (BFUS); 2 km NE Mrachenik Vill., 42°30.260'N 24°59.074'E, 717 m a.s.l., roadside meadows and shrubs, 24.v.2018, 4 ♂♂, 4 ♀♀, p/f, YP leg. (BFUS) (**Plate I, 5**); 3 km NE Mrachenik Vill., 42°30.102'N 24°59.900'E, 805 m a.s.l., roadside verges and an oak forest, 24.v.2018, 1 ♀, p/f, YP leg. (BFUS); Beter Peak area, N of Zmeyovo Vill., 42°30.570'N 25°37.493'E, 705 m a.s.l., dirt road, mixed forest with glades, 28.v.2018, 2 ♂♂, DGe leg. (BFUS); W of Stara Zagora, 42°24.547'N 25°33.442'E, 390 m a.s.l., meadows and shrubs, 04.vi.2018, 1 ♀, DGe leg. (BFUS); 5 km SW Chehlare Vill., 42°24.707'N 25°06.158'E, 431 m a.s.l., roadside vegetation, 23.vi.2018, 3 ♂♂, p/f, YP & DGr leg. (BFUS); 1 km NW Babek Vill., 42°27.184'N 25°04.127'E, 469 m a.s.l., meadows and roadside verges, 23.vi.2018, 1 ♂, 5 ♀♀, p/f, DGr & YP leg. (BFUS); 3,5 km NW Babek Vill., 42°28.461'N 25°03.852'E, 696 m a.s.l., roadside vegetation, cutting area, 23.vi.2018, 2 ♀♀, p/f, YP leg. (BFUS); Svezhen Vill., 42°30.292'N 25°01.540'E, 747 m a.s.l., riverside vegetation, 23.vi.2018, 2 ♂♂, 1 ♀, p/f, DGr leg. (BFUS); NW Svezhen Vill., 42°30.649'N 25°00.641'E, 749 m a.s.l., meadows next to a beech-oak forest, 23.vi.2018, 2 ♂♂, 2 ♀♀, p/f, YP leg. (BFUS); 1 km NW Dolno Novo Selo Vill., 42°25.911'N 25°13.826'E, 435 m a.s.l., meadows, 24.vi.2018, 1 ♂, p/f, DGr leg. (BFUS); 1 km SW Turia Vill., 42°33.829'N 25°10.442'E, 488 m a.s.l., hillside, 24.vi.2018, 3 ♂♂, p/f, DGr & YP leg. (BFUS); 3 km NW Gorno Novo Selo Vill., near Kaleto Place, 42°28.430'N 25°13.294'E, 808 m a.s.l., meadows and roadside verges, 24.vi.2018, 1 ♀, p/f, YP leg. (BFUS); 1 km SE Svezhen Vill., 42°29.242'N 25°02.469'E, 819 m a.s.l., meadows and roadside verges, 24.vi.2018, 1 ♂, p/f, DGr & YP leg. (BFUS); near Kavakliyka Chalet, 42°29.123'N 25°13.411'E, 975 m a.s.l., meadows, 24.vi.2018, 1 ♂, p/f, DGr & YP leg. (BFUS).

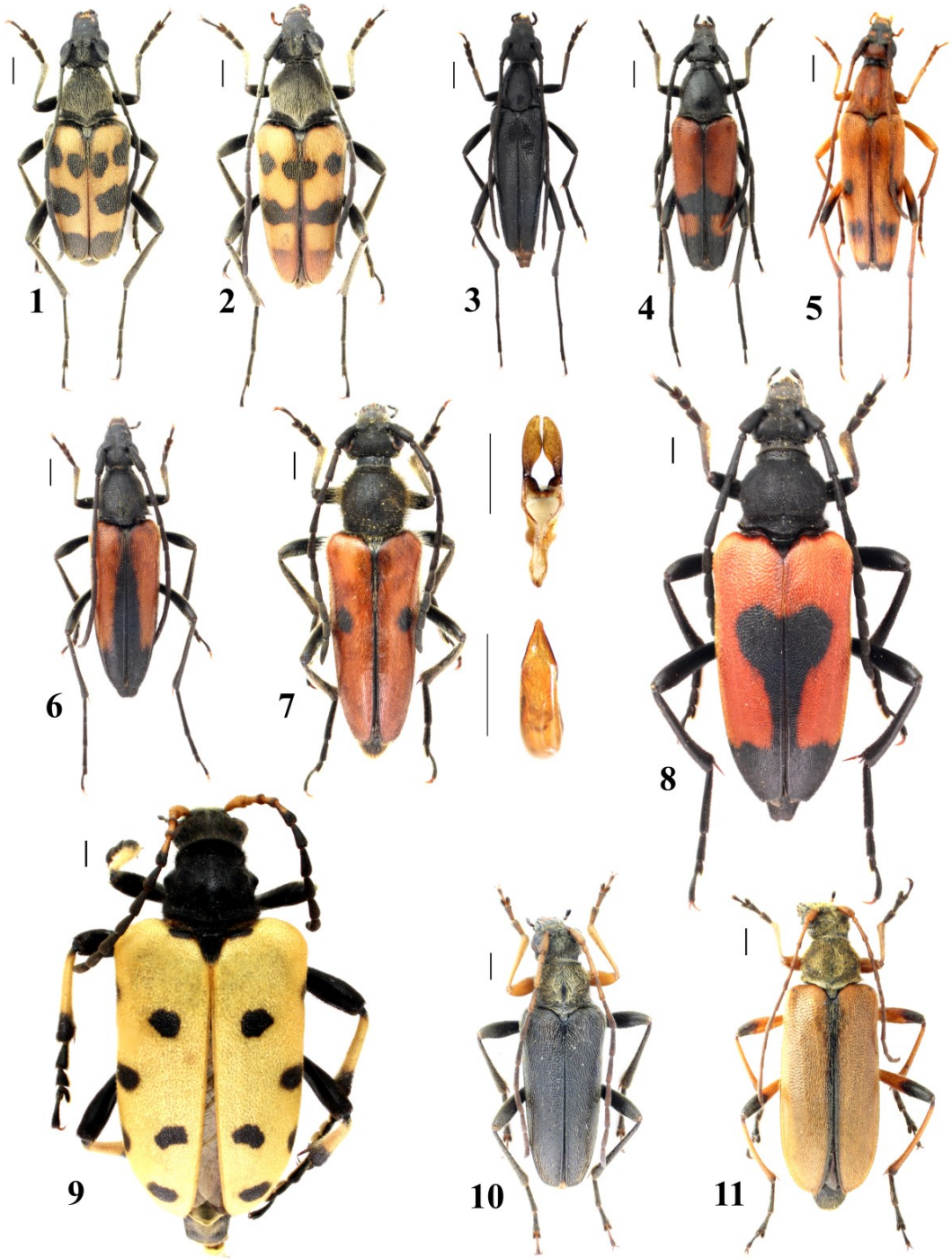

Plate I. 1 – *Pachytodes cerambyciformis*, 2 km NE Mrachenik Vill., 24.v.2018, male; 2 – *P. erraticus*, the same locality, 23.vi.2018, male; 3 – *Stenurella nigra nigra*, the same locality, 24.v.2018, male; 4 – *S. bifasciata bifasciata*, 1 km SW Turia Vill., 24.vi.2018, female; 5 – *S. septempunctata septempunctata*, 2 km NE Mrachenik Vill., 24.v.2018, female; 6 – *S. melanura samai*, 3 km SE Svezhen Vill., 23.vi.2018, female; 7 – *Vadonia unipunctata unipunctata*, 3 km NE Mrachenik Vill., 24.v.2018, male; 8 – *Stictoleptura cordigera cordigera*, 3 km NW Gorno Novo Selo Vill., 24.vi.2018, female; 9 – *Brachyta balcanica*, Beter Peak, 28.v.2018, female; 10 – *Cortodera flavimana flavimana*, 1 km SE Svezhen Vill., 23.v.2018, male; 11 – *Cortodera humeralis humeralis*, NW Svezhen Vill., 23.iv.2018, female. Scale bars: 1 mm.

***Stenurella (Stenurella) melanura samai* Rapuzzi, 1995**

Sredna Gora/S of Turia Vill. (Joakimov 1904: 32, as *Strangalia melanura* L.).

New data: on the road to Moruley Peak, 42°31.462'N 25°45.530'E, 620 m a.s.l., oak-hornbeam forest, forest glades, 07.vi.2018, 1 ♀, DGe leg. (BFUS); 5 km SW Chehlare Vill., 42°24.707'N 25°06.158'E, 431 m a.s.l., roadside vegetation, 23.vi.2018, 3 ♂♂, 1 ♀, p/f, YP & DGr leg. (BFUS); 1 km NW Babek Vill., 42°27.184'N 25°04.127'E, 469 m a.s.l., meadows and roadside verges, 23.vi.2018, 3 ♂♂, 3 ♀♀, p/f, DGr & YP leg. (BFUS); 3,5 km NW Babek Vill., 42°28.461'N 25°03.852'E, 696 m a.s.l., roadside vegetation, cutting area, 23.vi.2018, 1 ♂, 3 ♀♀, p/f, YP leg. (BFUS); 2 km NE Mrachenik Vill., 42°30.260'N 24°59.074'E, 717 m a.s.l., roadside meadows and shrubs, 23.vi.2018, 2 ♂♂, 3 ♀♀, p/f, YP leg. (BFUS); NW Svezhen Vill., 42°30.649'N 25°00.641'E, 749 m a.s.l., meadows and shrubs next to a beech-oak forest, 23.vi.2018, 1 ♂, 1 ♀, p/f, YP leg. (BFUS); 3 km SE Svezhen Vill., 42°28.875'N 25°03.264'E, 763 m a.s.l., meadows and roadside verges, 23.vi.2018 - 24.vi.2018, 5 ♂♂, 7 ♀♀, p/f, DGr & YP leg. (BFUS) (**Plate I, 6**); near Rozovets Vill., bank of Stara Reka Riv., 42°27.685'N 25°07.232'E, 469 m a.s.l., riverside vegetation, 24.vi.2018, 1 ♂, p/f, DGr leg. (BFUS); 1 km SW Turia Vill., 42°33.829'N 25°10.442'E, 488 m a.s.l., hillside, meadows, 24.vi.2018, 2 ♂♂, 1 ♀, p/f, DGr & YP leg. (BFUS); the same locality and date, but 1 ♂, 2 ♀♀, p/f, YP & IGr leg. (BFUS); 5 km SE Turia Vill., 42°31.786'N 25°11.763'E, 565 m a.s.l., riverside meadows and roadside verges, 24.vi.2018, 4 ♂♂, 6 ♀♀, p/f, DGr & YP leg. (BFUS); 3 km NW Gorno Novo Selo Vill., near Kaleto Place, 42°28.451'N 25°13.324'E, 800 m a.s.l., meadows and roadside verges, 24.vi.2018, 1 ♂, p/f, DGr leg. (BFUS); the same data, but 42°28.430'N 25°13.294'E, 808 m a.s.l., 24.vi.2018, 13 ♂♂, 5 ♀♀, p/f, YP leg. (BFUS); the same locality, but 22.vii.2018, 1 ♂, 1 ♀, p/f, YP leg. (BFUS); near Kavakliyka Chalet, 42°29.123'N 25°13.411'E, 975 m a.s.l., meadows, 24.vi.2018, 2 ♂♂, 2 ♀♀, p/f, DGr & YP leg. (BFUS); S Osetenovo Vill., bank of Turiyska Reka River, 42°32.717'N 25°02.533'E, 670 m a.s.l., riverside meadow with oak, oak and willow, 07.vii. - 11.xi.2019, 1 ♀, pitfall trap, TT & NK leg. (BFUS).

Notes: In Bulgaria the subspecies is known from a number of localities from Strandzha Mts. (Rapuzzi & Georgiev 2007, Georgiev *et al.* 2018). All examined specimens (40 males and 37 females) from Sarnena Gora have distinct gold pubescence on the elytra and pronotum, which according to Rapuzzi (1995) is characteristic of *S. melanura samai*. This indicated that the populations of the species in the study area belong to the latter subspecies.

***Stictoleptura (Maculileptura) pallens* (Brullé, 1832)**

New data: Beter Peak area, N of Zmeyovo Vill., 42°30.570'N 25°37.493'E, 705 m a.s.l., dirt road, mixed forest with glades, 28.v.2018, 1 ♂, DGe leg. (BFUS).

***Stictoleptura (Melanoleptura) scutellata scutellata* (Fabricius, 1781)**

Sredna Gora/S of Turia Vill. (Joakimov 1904: 32, as *Leptura scutellata* Fabr.); Turia Vill. and Bratan Peak (Kantardjiewa-Minkowa 1932: 90, as *Leptura scutellata* F.); rev.: Turia [in Cyrillic]/19.viii.1897/Col. D. Ioakimov, 1 ♀ (NMNHS); Turia vill. [in Cyrillic]/23.viii.1920/D. Ioakimov, 1 ♀ (NMNHS).

New data: Moruley Peak, 42°32.428'N 25°45.435'E, 895 m a.s.l., oak forest, herbaceous vegetation, 07.vi.2018, 1 ♂, DGe leg. (BFUS); near Kavakliyka Chalet, 42°29.123'N 25°13.411'E, 975 m a.s.l., meadows, 24.vi.2018, 2 ♂♂, p/f, DGr & YP leg. (BFUS); 2 km NE Mrachenik Vill., 42°30.260'N 24°59.074'E, 717 m a.s.l., roadside meadows and shrubs, 21.vii.2018, 1 ♂, p/f, DGr & YP leg. (BFUS); 3 km NW Gorno Novo Selo Vill.,

near Kaleto Place, 42°28.430'N 25°13.294'E, 808 m a.s.l., meadows and roadside verges, 22.vii.2018, 1 ♂, 2 ♀♀, p/f, YP leg. (BFUS).

***Stictoleptura (Paracorymbia) fulva* (De Geer, 1775)**

New data: 1 km NW Babek Vill., 42°27.184'N 25°04.127'E, 469 m a.s.l., meadows and roadside verges, 23.vi.2018, 1 ♀, p/f, DGr & YP leg. (BFUS); 3,5 km NW Babek Vill., 42°28.461'N 25°03.852'E, 696 m a.s.l., roadside vegetation, cutting area, 23.vi.2018, 1 ♂, p/f, YP leg. (BFUS); 3 km SE Svezhen Vill., 42°28.875'N 25°03.264'E, 763 m a.s.l., meadows and roadside verges, 23.vi.2018 - 24.vi.2018, 1 ♂, 3 ♀♀, p/f, DGr & YP leg. (BFUS); 1 km NW Dolno Novo Selo Vill., 42°25.911'N 25°13.826'E, 435 m a.s.l., meadows, 24.vi.2018, 1 ♂, 1 ♀, p/f, DGr leg. (BFUS); near Rozovets Vill., bank of Stara Reka Riv., 42°27.685'N 25°07.232'E, 469 m a.s.l., riverside vegetation, 24.vi.2018, 1 ♀, p/f, DGr leg. (BFUS); 1 km SW Turia Vill., 42°33.829'N 25°10.442'E, 488 m a.s.l., hillside, meadows, 24.vi.2018, 3 ♂♂, 3 ♀♀, p/f, DGr & YP leg. (BFUS); the same locality and date, but 3 ♂♂, 3 ♀♀, p/f, YP & IGr leg. (BFUS); 4,5 km SW Chehlare Vill., 42°24.744'N 25°06.337'E, 450 m a.s.l., dirt road, meadows, 21.vii.2018, 1 ♂, p/f, YP leg. (BFUS); 2 km NE Mrachenik Vill., 42°30.260'N 24°59.074'E, 717 m a.s.l., roadside meadows and shrubs, 21.vii.2018, 1 ♂, p/f, DGr & YP leg. (BFUS); 3 km NE Mrachenik Vill., 42°30.123'N 24°59.887'E, 809 m a.s.l., meadows, 21.vii.2018, 1 ♂, 1 ♀, p/f, YP leg. (BFUS).

***Stictoleptura (Stictoleptura) cordigera cordigera* (Füesslins, 1775)**

New data: Hrishteni Vill., 42°27.212'N 25°42.315'E, 230 m a.s.l., yard of a house, 9.vi.2018, 1 ♂, on flowers of *Allium cepa* L., DGe leg. (BFUS); near Babek Vill., 42°26.225'N 25°04.847'E, 385 m a.s.l., roadside verges, 23.vi.2018, 1 ♂, p/f, DGr & YP leg. (BFUS); 4,5 km SW Chehlare Vill., 42°24.744'N 25°06.337'E, 450 m a.s.l., dirt road, meadows, 23.vi.2018, 1 ♂, p/f, DGr & YP leg. (BFUS); the same locality, but 21.vii.2018, 1 ♂, p/f, YP leg. (BFUS); 3 km SE Svezhen Vill., 42°28.875'N 25°03.264'E, 763 m a.s.l., meadows and roadside verges, 23.vi.2018 - 24.vi.2018, 1 ♀, p/f, DGr & YP leg. (BFUS); 3 km NW Gorno Novo Selo Vill., near Kaleto Place, 42°28.430'N 25°13.294'E, 808 m a.s.l., meadows and roadside verges, 24.vi.2018, 1 ♀, p/f, YP leg. (BFUS) (**Plate I, 8**).

***Strangalia attenuata* (Linnaeus, 1758)**

Turia Vill. (Kantardjieva-Minkova 1957: 546, as *Strangalina attenuata* L.)

New data: 5 km SW Chehlare Vill., 42°24.707'N 25°06.158'E, 431 m a.s.l., roadside vegetation, 23.vi.2018, 3 ♀♀, p/f, YP & DGr leg. (BFUS); the same locality, but 21.vii.2018, 1 ♂, p/f, DGr & YP leg. (BFUS); 1 km NW Babek Vill., 42°27.184'N 25°04.127'E, 469 m a.s.l., meadows and roadside verges, 23.vi.2018, 6 ♂♂, 5 ♀♀, p/f, DGr & YP leg. (BFUS); 3,5 km NW Babek Vill., 42°28.461'N 25°03.852'E, 696 m a.s.l., roadside vegetation, cutting area, 23.vi.2018, 4 ♂♂, 2 ♀♀, p/f, YP leg. (BFUS); 1 km NW Dolno Novo Selo Vill., 42°25.911'N 25°13.826'E, 435 m a.s.l., meadows, 24.vi.2018, 1 ♂, p/f, DGr leg. (BFUS); near Rozovets Vill., bank of Stara Reka Riv., 42°27.685'N 25°07.232'E, 469 m a.s.l., riverside vegetation, 24.vi.2018, 1 ♂, p/f, DGr leg. (BFUS); near Kavakliyka Chalet, 42°29.123'N 25°13.411'E, 975 m a.s.l., meadows, 22.vii.2018, 1 ♂, p/f, DGr & YP leg. (BFUS).

***Vadonia unipunctata unipunctata* (Fabricius, 1787)**

New data: near Stara Zagora, N of Dabrava quarter, 42°27.505'N 25°35.617'E, 520 m a.s.l., oak-hornbeam forest, 23.v.2018, 1 ♂, DGe leg. (BFUS); 1 km SE Svezhen Vill., 42°29.377'N 25°02.429'E, 793 m a.s.l., meadows, 23.v.2018, 2 ♂♂, 1 ♀, p/f, YP, IGr & DGr leg. (BFUS); the same data, but 42°29.423'N 25°02.509'E, 810 m a.s.l., 23.v.2018, 1 ♀, p/f, DGr leg. (BFUS); 1,5 km NW Babek Vill., 42°27.384'N 25°04.172'E, 512 m a.s.l., meadows, 24.v.2018, 1 ♀, p/f, DGr leg. (BFUS); 3 km NE Mrachenik Vill., 42°30.102'N 24°59.900'E,

805 m a.s.l., roadside verges and an oak forest, 24.v.2018, 2 ♂♂, 1 ♀, p/f, YP leg. (BFUS) (**Plate I, 7**); NW Svezhen Vill., 42°30.649'N 25°00.641'E, 749 m a.s.l., meadows and shrubs next to a beech-oak forest, 23.vi.2018, 1 ♂, p/f, YP leg. (BFUS).

Rhagiini Kirby, 1837

***Brachyta (Fasciobrachyta) balcanica* Hampe, 1870**

New data: Beter Peak, 42°30.687'N 25°37.773'E, 809 m a.s.l., deciduous forest with *Quercus* sp., *Carpinus betulus* L., *Acer* sp., rocks and forest glades with *Paeonia* sp., 28.v.2018, 1 ♀, DGe leg. (BFUS) (**Plate I, 9**).

***Cortodera flavimana flavimana* (Waltl, 1838)**

New data: near Babek Vill., 42°26.262'N 25°04.794'E, 388 m a.s.l., meadows, 22.iv.2018, 12 ♂♂, 3 ♀♀, on flowers of *Ranunculus* sp., YP & DGr leg. (BFUS); near Rozovets Vill., 42°27.186'N 25°06.603'E, 426 m a.s.l., riverside meadows, 23.iv.2018, 2 ♂♂, 2 ♀♀, on flowers of *Ranunculus* sp., DGr & YP leg. (BFUS); 1 km SW Turia Vill., 42°33.862'N 25°10.386'E, 480 m a.s.l., roadside verges, 23.iv.2018, 1 ♂, p/f, DGr & YP leg. (BFUS); SE Beguntsi Vill., near Byala Reka Riv., 42°32.601'N 24°53.247'E, 321 m a.s.l., riverside meadows, 23.v.2018, 2 ♂♂, p/f, DGr & YP leg. (BFUS); 1 km SE Svezhen Vill., 42°29.377'N 25°02.429'E, 793 m a.s.l., meadows, 23.v.2018, 14 ♂♂, 11 ♀♀, on flowers of *Ranunculus* sp., YP, IGr & DGr leg. (BFUS) (**Plate I, 10**); the same data, but 42°29.423'N 25°02.509'E, 810 m a.s.l., 3 ♂♂, 3 ♀♀, DGr leg. (BFUS); 1 km SW Turia Vill., 42°33.862'N 25°10.386'E, 480 m a.s.l., meadows and roadside verges, 24.v.2018, 1 ♀, p/f, DGr & YP leg. (BFUS); 5 km SE Turia Vill., 42°31.786'N 25°11.763'E, 565 m a.s.l., riverside meadows and roadside verges, 24.v.2018, 2 ♂♂, 1 ♀, p/f, DGr & YP leg. (BFUS); Svezhen Vill., 42°30.292'N 25°01.540'E, 747 m a.s.l., riverside vegetation, 25.v.2018, 1 ♀, p/f, DGr leg. (BFUS); NW Svezhen Vill., 42°30.649'N 25°00.641'E, 749 m a.s.l., edge of a beech-oak forest, 25.v.2018, 1 ♀, p/f, YP leg. (BFUS).

***Cortodera humeralis humeralis* (Schaller, 1783)**

New data: 5 km SW Chehlare Vill., 42°24.708'N 25°06.145'E, 429 m a.s.l., roadside vegetation, 22.iv.2018, 1 ♀, p/f, DGr & YP leg. (BFUS); NW Svezhen Vill., 42°30.653'N 25°00.629'E, 752 m a.s.l., edge of a beech-oak forest, 23.iv.2018, 1 ♀, YP leg. (BFUS) (**Plate I, 11**).

***Dinoptera collaris* (Linnaeus, 1758)**

New data: N of Kolena Vill., 42°29.340'N 25°43.220'E, 290 m a.s.l., riverine forest, forest glades, 23.v.2017, 1 ♂, DGe leg. (BFUS); SE Beguntsi Vill., near Byala Reka Riv., 42°32.601'N 24°53.247'E, 321 m a.s.l., riverside meadows, 23.v.2018, 1 ♀, p/f, DGr & YP leg. (BFUS); 1 km SE Svezhen Vill., 42°29.377'N 25°02.429'E, 793 m a.s.l., meadows, 23.v.2018, 1 ♂, 1 ♀, p/f, YP & DGr leg. (BFUS); the same data, but 42°29.423'N 25°02.509'E, 810 m a.s.l., 23.v.2018, 6 ♂♂, 1 ♀, p/f, DGr leg. (BFUS); Svezhen Vill., 42°30.292'N 25°01.540'E, 747 m a.s.l., riverside vegetation, 25.v.2018, 1 ♀, p/f, DGr leg. (BFUS); NW Svezhen Vill., 42°30.649'N 25°00.641'E, 749 m a.s.l., edge of a beech-oak forest, 25.v.2018, 1 ♀, p/f, YP leg. (BFUS); Beter Peak area, N of Zmeyovo Vill., 42°30.570'N 25°37.493'E, 705 m a.s.l., dirt road, mixed forest with glades, 28.v.2018, 1 ♀, DGe leg. (BFUS).

***Rhagium (Megarhagium) mordax* (De Geer, 1775)**

New data: E Svezhen Hut, 42°30.600'N 25°04.433'E, 975 m a.s.l., beech forest, 11.xi.2019 – 09.v.2020, 1 ♂, pitfall trap, TT & NK leg. (BFUS).

***Rhagium (Rhagium) inquisitor inquisitor* (Linnaeus, 1758)**

Buzovgrad Vill. (Ganev 1985: 148, as *Rhagium inquisitor* L.).

Spondylidinae Audinet-Serville, 1832

Asemini J. Thomson, 1861

****Arhopalus ferus* (Mulsant, 1839)**

New data: Hrishteni Vill., 42°27.212'N 25°42.315'E, 230 m a.s.l., yard of a house, viii. 2016, 1 ♂, found dead, DGe leg. (BFUS); the same locality, but 21.vii.2018, 1 ♀, DGe leg. (BFUS).

****Arhopalus rusticus rusticus* (Linnaeus, 1758)**

New data: Hrishteni Vill., 42°27.212'N 25°42.315'E, 230 m a.s.l., yard of a house, 02.v.2018, 1 ♀, on lamp, DGe leg. (BFUS); 2 km SW Chehlare Vill., 42°24.862'N 25°08.352'E, 507 m a.s.l., pine forest, 25.viii.2018, 1 ♀, found dead under bark, ECh leg. (BFUS).

Saphanini Gistel, 1848

****Saphanus piceus ganglbaueri* Brancsik, 1886**

New data: NW Svezhen Hut, 42°31.050'N 25°02.667'E, 1022 m a.s.l., pure beech forest, 22.iii. - 07.vii.2019, 1 ♂, pitfall trap, TT & NK leg. (BFUS); S Pavel Banya, 42°31.583'N 25°11.983'E, 583 m a.s.l., riverine forest of *Carpinus* sp., *Alnus* sp., *Corylus avellana* L., 24.iii. - 09.vii.2019, 1 ♀, pitfall trap, TT & NK leg. (BFUS); E Svezhen Hut, 42°30.583'N 25°03.850'E, 1100 m a.s.l., beech forest, mountain ridge, 07.vii. - 11.xi.2019, 1 ♀, pitfall trap, TT & NK leg. (BFUS) (**Plate II, 12**).

Spondylidini Audinet-Serville, 1832

****Spondylis buprestoides* (Linnaeus, 1758)**

New data: NW Svezhen Hut, 42°31.000'N 25°02.633'E, 1015 m a.s.l., Scots pine (*Pinus sylvestris* L.) stands mixed with spruce, Douglas fir and beech, 07.vii. - 11.xi.2019, 1 ♀, pitfall trap, TT & NK leg. (BFUS).

Tetropiini Seidlitz, 1891

***Tetropium fuscum fuscum* (Fabricius, 1787)**

Buzovgrad Vill. (Ganev 1985: 148, as *Tetropium fuscum* Fab.).

Cerambycinae Latreille, 1802

Callidiini Kirby, 1837

****Callidium (Callidium) violaceum* (Linnaeus, 1758)**

New data: Hrishteni Vill., 42°27.212'N 25°42.315'E, 230 m a.s.l., yard of a house, iii.2017, 6 ♂♂, 6 ♀♀, found dead, DGe leg. (BFUS); the same data, but 25.iv.2018, 1 ♂, DGe leg. (BFUS); the same data, but 06.v.2018, 1 ♀, in spider web, DGe leg. (BFUS); the same data, but in the house, 18.v.2018, 1 ♀, DGe leg. (BFUS).

***Phymatodes (Phymatoderus) lividus* (Rossi, 1794)**

Stara Zagora (Sredna Gora) (Nedelkov 1909a: 14, as *Phymatodes glabratum* Charp., determination revised by Kantardjiewa-Minkowa 1932: 95).

****Phymatodes (Phymatodes) testaceus* (Linnaeus, 1758)**

New data: Hrishteni Vill., 42°27.212'N 25°42.315'E, 230 m a.s.l., yard of a house, 15.v.2018, 1 ♂, on the window net, DGe leg. (BFUS).

***Ropalopus (Ropalopus) clavipes* (Fabricius, 1775)**

New data: Hrishteni Vill., 42°27.212'N 25°42.315'E, 230 m a.s.l., yard of a house, 20.v.2018, 1 ♂, in herbaceous vegetation, DGe leg. (BFUS).

***Ropalopus (Ropalopus) femoratus* (Linnaeus, 1758)**

Buzovgrad Vill. (Ganev 1985: 149, as *Rhopalopus femoratus* L.).

Cerambycini Latreille, 1802

***Cerambyx (Cerambyx) dux* (Faldermann, 1837)**

Turia Vill. (Kantardjiewa-Minkowa 1932: 84).

***Cerambyx (Cerambyx) miles* Bonelli, 1812**

Turia Vill. (Joakimov 1904: 33).

New data: Turia Vill. [in Cyrillic]/2.VII.[19]20]/ex collectio/D. Joakimov/Bulgarien, 1 ♂, 1 ♀ (NMNHS).

***Cerambyx (Microcerambyx) scopolii scopolii* Fuessly, 1775**

Buzovgrad Vill. (Ganev 1985: 149, as *Cerambyx scopolii* Fuess.).

New data: Hrishteni Vill., 42°27.212'N 25°42.315'E, 230 m a.s.l., to the yard of a house, 02.v.2018, 1 ♀, on a dirt road, DGe leg. (BFUS); 3 km S Turia Vill., 42°32.601'N 25°10.937'E, 538 m a.s.l., hillside, meadows, roadside verges, 24.v.2018, 1 ♂, 1 ♀, DGr & YP leg. (BFUS); 5 km SE Turia Vill., 42°31.786'N 25°11.763'E, 565 m a.s.l., riverside meadows and roadside verges, 24.v.2018, 1 ♂, 1 ♀, p/f, DGr & YP leg. (BFUS); 2 km NE Mrachenik Vill., 42°30.260'N 24°59.074'E, 717 m a.s.l., roadside meadows and shrubs, 24.v.2018, 1 ♀, DGr leg. (BFUS); NW Svezhen Vill., 42°30.649'N 25°00.641'E, 749 m a.s.l., edge of a beech-oak forest, 25.v.2018, 1 ♀, p/f, YP leg. (BFUS); Beter Peak area, N of Zmeyovo Vill., 42°30.570'N 25°37.493'E, 705 m a.s.l., dirt road, mixed forest with glades, 28.v.2018, 2 ♂♂, DGe leg. (BFUS); 3,5 km NW Babek Vill., 42°28.461'N 25°03.852'E, 696 m a.s.l., roadside vegetation, cutting area, 23.vi.2018, 1 ♀, YP leg. (BFUS).

Clytini Mulsant, 1839

***Chlorophorus (Crassofasciatus) hungaricus* Seidlitz, 1891**

New data: W of Stara Zagora, 42°24.547'N 25°33.442'E, 390 m a.s.l., meadows and shrubs, 04.vi.2018, 1 ♀, DGe leg. (BFUS) (**Plate II, 13**).

***Chlorophorus (Humeromaculatus) figuratus* (Scopoli, 1763)**

New data: S of Shanovo Vill., 42°31.867'N 25°38.698'E, 434 m a.s.l., oak-hornbeam forest, 15.v.2018, 1 ♀, DGe leg. (BFUS); 1,5 km NW Babek Vill., 42°27.384'N 25°04.172'E, 512 m a.s.l., meadows, 24.v.2018, 1 ♀, p/f, DGr leg. (BFUS); Beter Peak area, N of Zmeyovo Vill., 42°30.570'N 25°37.493'E, 705 m a.s.l., dirt road, mixed forest with glades, 28.v.2018, 1 ♂, 1 ♀, DGe leg. (BFUS).

***Chlorophorus (Immaculatus) varius varius* (O. F. Müller, 1766)**

New data: Hrishteni Vill., 42°27.212'N 25°42.315'E, 230 m a.s.l., yard of a house, 13.vi.2018, 1 ♂, attractant trap for Zygaenidae, on *Prunus domestica* L., DGe leg. (BFUS); the same data, but 27.vi.2018, 1 ♀, on the wall of a house, DGe leg. (BFUS); 1 km SW Turia Vill., 42°33.829'N 25°10.442'E, 488 m a.s.l., hillside, meadows, 24.vi.2018, 1 ♂, p/f, DGr leg. (BFUS) (**Plate II, 14**); 5 km SW Chehlare Vill., 42°24.707'N 25°06.158'E, 431 m a.s.l., roadside vegetation, 21.vii.2018, 1 ♂, 1 ♀, p/f, DGr & YP leg. (BFUS).

***Chlorophorus (Perderomaculatus) sartor* (O. F. Müller, 1766)**

New data: 1 km NW Dolno Novo Selo Vill., 42°25.886'N 25°13.792'E, 437 m a.s.l., dirt road, roadside vegetation, 24.vi.2018, 1 ♀, p/f, YP & IGr leg. (BFUS); near Rozovets Vill., bank of Stara Reka Riv., 42°27.685'N 25°07.232'E, 469 m a.s.l., riverside vegetation, 24.vi.2018, 1 ♂, p/f, DGr leg. (BFUS); W of Yagoda Vill., 42°32.347'N 25°33.578'E, 315 m a.s.l., streamside meadows with shrub and tree vegetation, 02.vii.2018, 1 ♀, DGe leg. (BFUS); 5 km SW Chehlare Vill., 42°24.707'N 25°06.158'E, 431 m a.s.l., roadside vegetation, 21.vii.2018, 1 ♂, 1 ♀, p/f, DGr & YP leg. (BFUS); 4,5 km SW Chehlare Vill., 42°24.744'N 25°06.337'E, 450 m a.s.l., dirt road, meadows, 21.vii.2018, 1 ♂, 3 ♀♀, p/f, YP leg. (BFUS).

***Clytus (Clytus) rhamni temesiensis* (Germar, 1824)**

Sredna Gora/S of Turia Vill. (Joakimov 1904: 33, as *Clytus rhamnus* Germ.); Buzovgrad Vill. (Ganev 1985: 150, as *Clytus rhamni* Ger.).

New data: near Zelenikovo Vill., 42°24.969'N 25°04.815'E, 330 m a.s.l., roadside verges, 24.v.2018, 1 ♂, p/f, YP leg. (BFUS); on the road to Moruley Peak, 42°31.462'N 25°45.530'E, 620 m a.s.l., oak-hornbeam forest, forest glades, 07.vi.2018, 1 ♀, DGe leg. (BFUS); 5 km SW Chehlare Vill., 42°24.707'N 25°06.158'E, 431 m a.s.l., roadside vegetation, 23.vi.2018, 1 ♂, 3 ♀♀, p/f, YP & DGr leg. (BFUS); 1 km NW Babek Vill., 42°27.184'N 25°04.127'E, 469 m a.s.l., meadows and roadside verges, 23.vi.2018, 3 ♂♂, 1 ♀, p/f, DGr leg. (BFUS); 3 km SE Svezhen Vill., 42°28.875'N 25°03.264'E, 763 m a.s.l., meadows and roadside verges, 23.vi.2018 - 24.vi.2018, 2 ♀♀, p/f, DGr & YP leg. (BFUS) (**Plate II, 15**); 3 km NW Gorno Novo Selo Vill., near Kaleto Place, 42°28.451'N 25°13.324'E, 800 m a.s.l., meadows and roadside verges, 24.vi.2018, 2 ♂♂, 1 ♀, p/f, DGr leg. (BFUS); the same data, but 42°28.430'N 25°13.294'E, 808 m a.s.l., 24.vi.2018, 2 ♂♂, 1 ♀, p/f, YP leg. (BFUS); 1 km SE Svezhen Vill., 42°29.242'N 25°02.469'E, 819 m a.s.l., meadows and roadside verges, 24.vi.2018, 1 ♂, 1 ♀, p/f, DGr & YP leg. (BFUS).

***Echinocerus floralis* (Pallas, 1773)**

Buzovgrad Vill. (Ganev 1985: 150, as *Plagionotus floralis* Pall.).

New data: W of Stara Zagora, 42°24.547'N 25°33.442'E, 390 m a.s.l., meadows and shrubs, 04.vi.2018, 1 ♀, DGe leg. (BFUS); 4,5 km SW Chehlare Vill., 42°24.744'N 25°06.337'E, 450 m a.s.l., dirt road, meadows, 23.vi.2018, 2 ♂♂, p/f, DGr & YP leg. (BFUS) (**Plate II, 16**); 1 km NW Babek Vill., 42°27.184'N 25°04.127'E, 469 m a.s.l., meadows and roadside verges, 23.vi.2018, 1 ♀, p/f, DGr leg. (BFUS).

***Isotomus speciosus speciosus* (D. H. Schneider, 1787)**

Turia Vill. (Kantardjiewa-Minkowa 1932: 98, as *Isotomus speciosus* Schneid.); Buzovgrad Vill. (Ganev 1985: 150, as *Isotomus speciosus* Schneider).

***Plagionotus arcuatus arcuatus* (Linnaeus, 1758)**

Buzovgrad Vill. (Ganev 1985: 150, as *Plagionotus arcuatus* L.).

***Xylotrechus (Xylotrechus) arvicola* arvicola (Olivier, 1795)**

Buzovgrad Vill. (Ganev 1985: 150, as *Xylotrechus arvicola* Oliv.).

Graciliini Mulsant, 1839

***Axinopalpis gracilis gracilis* (Krynicki, 1832)**

New data: Hrishteni Vill., 42°27.212'N 25°42.315'E, 230 m a.s.l., yard of a house, 12.vi.2018, 1 ♂, on lamp, DGe leg. (BFUS).

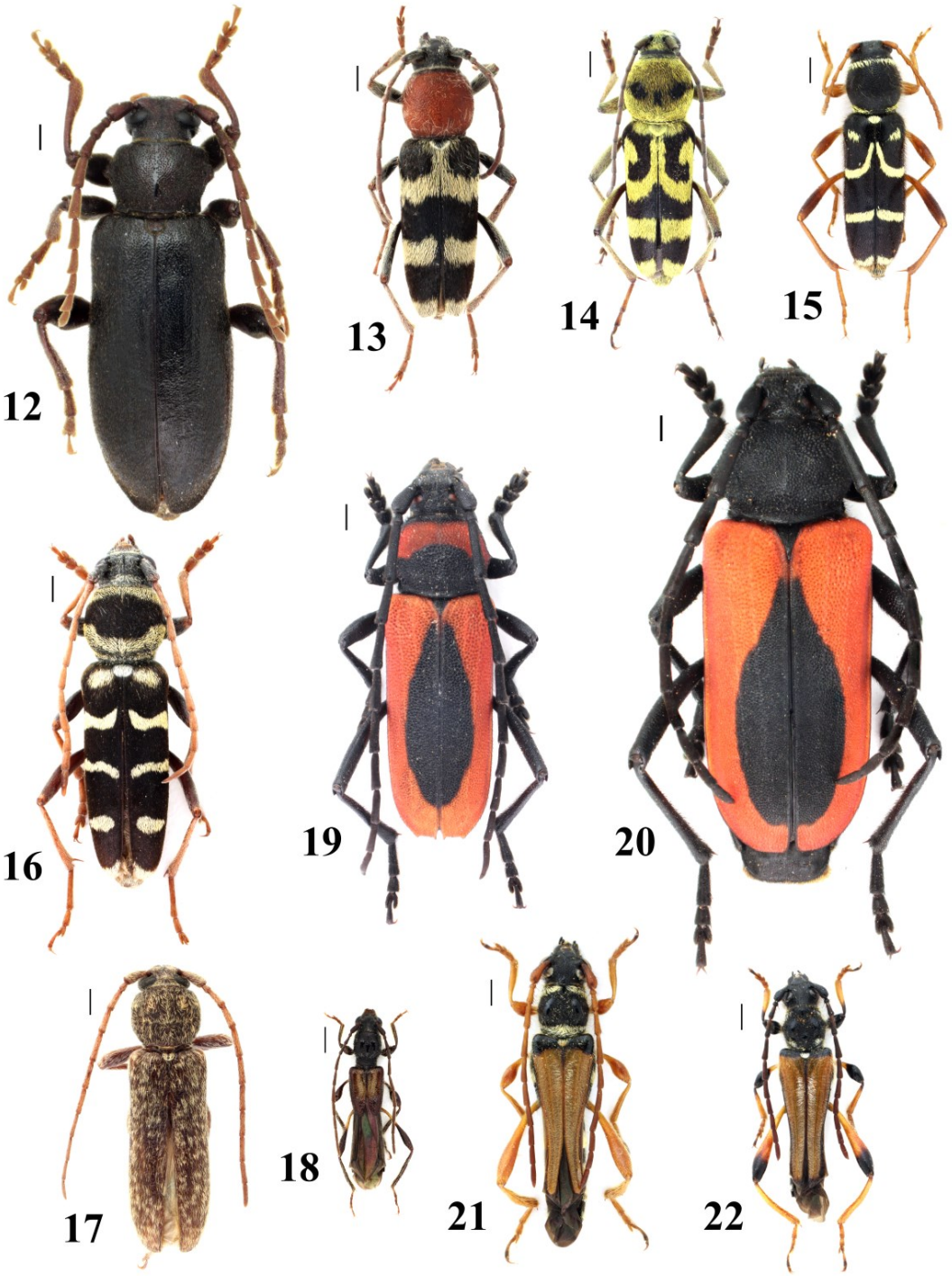

Plate II. 12 – *Saphanus piceus ganglbaueri*, E Svezhen Hut, 07.vii.2019 - 11.xi.2019, female; 13 – *Chlorophorus hungaricus*, W of Stara Zagora, 04.vi.2018, female; 14 – *Ch. varius varius*, 1 km SW Turia Vill., 24.vi.2018, male; 15 – *Clytus rhamni temesiensis*, 3 km SE Svezhen Vill., 24.vi.2018, female; 16 – *Echinocerus floralis*, 4,5 km SW Chehlare Vill., 23.vi.2018, male; 17 – *Trichoferus fasciculatus fasciculatus*, Hrishteni Vill., 17.viii.2018, male; 18 – *Molorchus umbellatarum umbellatarum*, SE Beguntsi Vill., 23.v.2018, female; 19 – *Purpuricenus globulicollis globulicollis*, 5 km SE Turia Vill., 24.vi.2018, male; 20 – *P. kaehleri rossicus*, 1 km NW Dolno Novo Selo Vill., 24.vi.2018, female; 21 – *Stenopterus flavicornis*, 1,5 km NW Babek Vill., 23.vi.2018, male; 22 – *S. rufus geniculatus*, 3 km SE Svezhen Vill., male. Scale bars: 1 mm.

***Penichroa fasciata* (Stephens, 1831)**

Turia Vill. (Joakimov 1904: 32, as *Exilia timida* Muls. [sic!], Kantardjiewa-Minkowa 1932: 85); rev.: Turia [in Cyrillic]/1.viii.1898/Col. D. Ioakimov, 2 ex. (NMNHS).

New data: Hrishteni Vill., 42°27.212'N 25°42.315'E, 230 m a.s.l., yard of a house, 11.vii.2018, 1 ♂, under the window, DGe leg. (BFUS).

Hesperophanini Mulsant, 1839

***Stromatium auratum* (Böber, 1793)**

Turia Vill. (Joakimov 1904: 32, as *Stromatium unicolor* Oliv.); rev.: Turia [in Cyrillic]/1.viii.1900/Col. D. Ioakimov, 1 ex. (NMNHS); Turia [in Cyrillic]/20.vii.1907/Col. D. Ioakimov, 1 ex. (NMNHS).

New data: Hrishteni Vill., 42°27.212'N 25°42.315'E, 230 m a.s.l., yard of a house, x. (?) 2017, 1 ♀, found dead, DGe leg. (BFUS); the same data, but 15.vii.2018, 1 ♀, DGe leg. (BFUS); the same data, but 10.viii.2018, 1 ♂, DGe leg. (BFUS).

***Trichoferus fasciculatus fasciculatus* (Faldermann, 1837)**

Turia Vill. (Kantardjiewa-Minkowa 1932: 84, as *Trichoferus griseus* Fabr. v. *fasciculatus* Fald.).

New data: Hrishteni Vill., 42°27.212'N 25°42.315'E, 230 m a.s.l., yard of a house, 15.vii.2018, 1 ♀, DGe leg. (BFUS); the same data, but 17.viii.2018, 1 ♂, on lamp, DGe leg. (BFUS) (**Plate II, 17**).

***#Trichoferus griseus* (Fabricius, 1793)**

Turia Vill. (Joakimov 1904: 32, as *Hesperophanes grisseus* Fabr.).

Notes: It is most likely that the cited record is based on the same material, later determined as *Trichoferus griseus* Fabr. v. *fasciculatus* Fald. by Kantardjiewa-Minkowa (1932). The presence of the species *T. griseus* (Fabricius, 1793) in the study area needs confirmation.

Hylotrupini Zagajkevitch, 1991

***Hylotrupes bajulus* (Linnaeus, 1758)**

Turia Vill. (Joakimov 1904: 32, as *Hilotrupes* [sic!] *bajulus* L.).

New data: Hrishteni Vill., 42°27.212'N 25°42.315'E, 230 m a.s.l., yard of a house, viii. 2016, 2 ♂♂, found dead, DGe leg. (BFUS); the same data, but iii.2017, 1 ♂, 2 ♀♀, DGe leg. (BFUS); the same data, but 02.v.2018, 1 ♀, on lamp, DGe leg. (BFUS); the same data, but 10.vi.2018, 1 ♀, found dead, DGe leg. (BFUS).

Molorchini Gistel, 1848

***Molorchus (Molorchus) umbellatarum umbellatarum* (Schreber, 1759)**

New data: SE Beguntsi Vill., near Byala Reka Riv., 42°32.601'N 24°53.247'E, 321 m a.s.l., riverside meadows, 23.v.2018, 2 ♀♀, p/f, DGr & YP leg. (BFUS) (**Plate II, 18**).

Purpuricenini J. Thomson, 1861

***Purpuricenus globulicollis globulicollis* Dejean, 1839**

New data: 5 km SE Turia Vill., 42°31.770'N 25°11.765'E, 565 m a.s.l., riverside forest, 24.vi.2018, 1 ♂, found dead in the river, DGr & IGr leg. (BFUS) (**Plate II, 19**).

***Purpuricenus kaehleri rossicus* Danilevsky, 2019**

Turia Vill. (Joakimov 1904: 33, as *Purpuricenus koehleri* [sic!] Fabr., Kantardjiewa-Minkowa 1932: 99, as *Purpuricenus Kaehleri* L.); rev.: Turia [in Cyrillic]/28.vii.1897/Col. D. Ioakimov, 1 ♂ (NMNHS).

New data: 1 km NW Dolno Novo Selo Vill., 42°25.886'N 25°13.792'E, 437 m a.s.l., dirt road, roadside vegetation, 24.vi.2018, 1 ♀, YP & IGr leg. (BFUS) (**Plate II, 20**).

Notes: The subspecies range includes South European Territory of Russia, North Caucasus, North-East Kazakhstan, Belarus, Ukraine, Moldova, Central Europe, partly South Europe (including Bulgaria) and North Turkey (Danilevsky (2019a, 2019b). The shape and position of the black elytral spot of the specimen from Sarnena Gora Mts. correspond well to some of the individuals in the type series (Danilevsky 2019b).

Rosaliini Fairmaire, 1864

***Rosalia (Rosalia) alpina alpina* (Linnaeus, 1758)**

Sredna Gora/S of Turia Vill. (Joakimov 1904: 33, as *Rosalia alpina* L.); rev.: Bratan [Peak] [in Cyrillic]/23.vii.1899/Col. D. Ioakimov, 1 ♂ (NMNHS).

New data: Turia [in Cyrillic]/28.vii.1906/Col. D. Ioakimov, 1 ♂ (NMNHS).

Notes: The species is included in Annexes II and IV of the Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (Council of Europe 1992).

Stenopterini Gistel, 1848

******Callimoxys gracilis* (Brullé, 1832)**

New data: 4,5 km SW Chehlare Vill., 42°24.689'N 25°06.265'E, 442 m a.s.l., meadows and shrubs, 22.iv.2018, 1 ♂, on flowers of *Crataegus monogyna* Jacq., YP leg. (BFUS); NW of Zmeyovo Vill., 42°30.197'N 25°36.025'E, 445 m a.s.l., grasses and shrubs near to alfalfa and fennel (*Foeniculum vulgare* Mill.) stands, 24.iv.2018, 1 ♂, DGe leg. (BFUS); 1 km SE Svezhen Vill., 42°29.377'N 25°02.429'E, 793 m a.s.l., meadows, 23.v.2018, 1 ♀, p/f, YP & DGr leg. (BFUS); near Zelenikovo Vill., 42°24.969'N 25°04.815'E, 330 m a.s.l., roadside verges, 24.v.2018, 1 ♂, 1 ♀, p/f, YP leg. (BFUS); 3 km S Turia Vill., 42°32.601'N 25°10.937'E, 538 m a.s.l., hillside, meadows, roadside verges, 24.v.2018, 1 ♀, p/f, DGr & YP leg. (BFUS).

***Callimus (Lampropterus) femoratus* (Germar, 1824)**

Sredna Gora/S of Turia Vill. (Joakimov 1904: 32, as *Callimus rumelicus* Auct. [sic!]); Turia Vill. (Kantardjiewa-Minkowa 1932: 93, as *Callimus Adonis* Ab.).

******Stenopterus flavicornis* Küster, 1846**

New data: 4,5 km SW Chehlare Vill., 42°24.744'N 25°06.337'E, 450 m a.s.l., dirt road, meadows, 23.vi.2018, 1 ♂, p/f, DGr & YP leg. (BFUS); 1,5 km NW Babek Vill., 42°27.384'N 25°04.172'E, 512 m a.s.l., meadows, 23.vi.2018, 1 ♂, p/f, DGr leg. (BFUS) (**Plate II, 21**).

******Stenopterus rufus geniculatus* Kraatz, 1863**

New data: 1 km SE Svezhen Vill., 42°29.423'N 25°02.509'E, 810 m a.s.l., meadows, 23.v.2018, 1 ♀, p/f, DGr leg. (BFUS); 1,5 km NW Babek Vill., 42°27.384'N 25°04.172'E, 512 m a.s.l., meadows, 24.v.2018, 1 ♂, 1 ♀, p/f, DGr leg. (BFUS); the same locality, but 23.vi.2018, 2 ♀♀, p/f, DGr leg. (BFUS); NW Svezhen Vill., 42°30.649'N 25°00.641'E, 749 m a.s.l., edge of a beech-oak forest, 25.v.2018, 1 ♀, p/f, YP leg. (BFUS); on the road to Moruley Peak, 42°31.462'N 25°45.530'E, 620 m a.s.l., oak-hornbeam forest, forest glades, 07.vi.2018, 1 ♀, DGe leg. (BFUS); 5 km SW Chehlare Vill., 42°24.707'N 25°06.158'E, 431 m a.s.l., roadside vegetation, 23.vi.2018, 2 ♂♂, 2 ♀♀, p/f, YP & DGr leg. (BFUS); 4,5 km SW

Chehlare Vill., 42°24.744'N 25°06.337'E, 450 m a.s.l., dirt road, meadows, 23.vi.2018, 5 ♂♂, 9 ♀♀, p/f, DGr & YP leg. (BFUS); 1 km NW Babek Vill., 42°27.184'N 25°04.127'E, 469 m a.s.l., meadows and roadside verges, 23.vi.2018, 4 ♂♂, 5 ♀♀, p/f, DGr & YP leg. (BFUS); 3 km SE Svezhen Vill., 42°28.875'N 25°03.264'E, 763 m a.s.l., meadows and roadside verges, 23.vi.2018 - 24.vi.2018, 2 ♂♂, 5 ♀♀, p/f, DGr & YP leg. (BFUS) (**Plate II, 22**); 1 km SW Turia Vill., 42°33.829'N 25°10.442'E, 488 m a.s.l., hillside, meadows, 24.vi.2018, 3 ♂♂, p/f, DGr & YP leg. (BFUS); 3 km NW Gorno Novo Selo Vill., near Kaleto Place, 42°28.430'N 25°13.294'E, 808 m a.s.l., meadows and roadside verges, 24.vi.2018, 2 ♂♂, 3 ♀♀, p/f, YP leg. (BFUS); 1 km SE Svezhen Vill., 42°29.242'N 25°02.469'E, 819 m a.s.l., meadows and roadside verges, 24.vi.2018, 1 ♀, p/f, DGr & YP leg. (BFUS).

Lamiinae Latreille, 1825

Acanthocinini Blanchard, 1845

***Leiopus (Leiopus) linnei* Wallin, Nylander & Kvamme, 2009**

New data: Hrishteni Vill., 42°27.212'N 25°42.315'E, 230 m a.s.l., yard of a house, 16.v.2018, 1 ♀, DGe leg. (BFUS) (**Plate III, 23**).

Notes: In Bulgaria, *L. linnei* was first reported without exact locality (Wallin *et al.* 2009) and later from the West Balkan Range (Gutowski *et al.* 2010, Gradinarov & Petrova 2019, Gradinarov *et al.* 2020), Strandzha Mts. (Georgiev *et al.* 2018), Belasitsa Mts. (Georgiev *et al.* 2019) and Upper Thracian Plain (Gradinarov *et al.* 2020).

Agapanthiini Mulsant, 1839

***Agapanthia (Agapanthia) cardui* (Linnaeus, 1767)**

New data: near Starozagorski Bani Vill., 42°26.900'N 25°29.562'E, 390 m a.s.l., high grass vegetation, 10.v.2018, 1 ♀, DGe leg. (BFUS); 3 km S Turia Vill., 42°32.601'N 25°10.937'E, 538 m a.s.l., hillside, meadows, roadside verges, 24.v.2018, 2 ♂♂, 1 ♀, p/f, DGr & YP leg. (BFUS); 2 km NE Mrachenik Vill., 42°30.260'N 24°59.074'E, 717 m a.s.l., roadside meadows and shrubs, 24.v.2018, 2 ♂♂, p/f, DGr leg. (BFUS).

***Agapanthia (Epoptes) dahli dahli* (C. F. W. Richter, 1820)**

Buzovgrad Vill. (Ganev 1985: 151, as *Agapanthia dahli* Richler); Srarozagorski bani (Georgiev 2020).

New data: near Zelenikovo Vill., 42°24.969'N 25°04.815'E, 330 m a.s.l., roadside verges, 24.v.2018, 2 ♂♂, 3 ♀♀, p/f, YP leg. (BFUS); 2 km NE Mrachenik Vill., 42°30.260'N 24°59.074'E, 717 m a.s.l., roadside meadows and shrubs, 24.v.2018, 1 ♀, p/f, DGr leg. (BFUS); N Zelenikovo Vill., 42°25.094'N 25°04.733'E, 343 m a.s.l., roadside vegetation next to rose plantations, 23.vi.2018, 1 ♂, p/f, DGr leg. (BFUS).

***Agapanthia (Epoptes) villosoviridescens* (De Geer, 1775)**

New data: near Starozagorski Bani Vill., 42°26.900'N 25°29.562'E, 390 m a.s.l., high grass vegetation, 10.v.2018, 1 ♂, 1 ♀, DGe leg. (BFUS); SE Beguntsi Vill., near Byala Reka Riv., 42°32.601'N 24°53.247'E, 321 m a.s.l., riverside meadows, 23.v.2018, 1 ♂, p/f, DGr & YP leg. (BFUS).

***Agapanthia (Smaragdula) osmanlis* Reiche et Saulcy, 1858**

New data: Pavel Banya town, 42°35.225'N25°12.480'E, 430 m a.s.l., roadside ruderal vegetation, 24.vi.2018, 2 ♂♂, on *Dipsacus laciniatus* L. (Caprifoliaceae), DGr leg. (BFUS) (**Plate III, 24**).

Notes: In Bulgaria, *A. osmanlis* is considered to be rare species (Migliaccio *et al.* 2007), reported from several localities from Black Sea coast and Strandzha Mts. (Kantardjiewa-Minkowa 1934, Simandl 2002, Rapuzzi & Sama 2012, Georgiev *et al.* 2005,

2015). The present report significantly expands the known range of the species in the country.

As a host plant family Hoskovec *et al.* (2020) indicate „Dipsacaceae“ (= Dipsacoideae: Caprifoliaceae). Rapuzzi & Sama (2012) designate *Cephalaria procera* Fisch & Avé-Lall. from the same plant family as a host plant of *A. osmanlis* and consider *Dipsacus laciniatus* L. to be the specific host plant for *Agapanthia viti* Rapuzzi & Sama, 2012. However, both specimens from Pavel Banya locality have the characteristic for *A. osmanlis* ash pubescence, instead of yellowish colored as in *A. viti*. The finding of *A. osmanlis* on the *Tragopogon* sp. (Asteraceae) in the Strandzha Mts. (Georgiev *et al.* 2005) appears to be rather accidental.

***Agapanthia (Smaragdula) violacea* (Fabricius, 1775)**

New data: N of Kolena Vill., 42°29.340'N 25°43.220'E, 290 m a.s.l., riverine forest, forest glades, 23.v.2017, 1 ♂, DGe leg. (BFUS); 3 km S Turia Vill., 42°32.601’N 25°10.937’E, 538 m a.s.l., hillside, meadows, roadside verges, 24.v.2018, 1 ♂, 1 ♀, p/f, DGr & YP leg. (BFUS); 5 km SE Turia Vill., 42°31.786’N 25°11.763’E, 565 m a.s.l., riverside meadows and roadside verges, 24.v.2018, 1 ♂, p/f, DGr & YP leg. (BFUS); 2 km NE Mrachenik Vill., 42°30.260’N 24°59.074’E, 717 m a.s.l., roadside meadows and shrubs, 24.v.2018, 1 ♀, p/f, YP leg. (BFUS); 3 km NE Mrachenik Vill., 42°30.102’N 24°59.900’E, 805 m a.s.l., roadside verges and an oak forest, 24.v.2018, 2 ♀♀, p/f, YP leg. (BFUS); NW Svezhen Vill., 42°30.649’N 25°00.641’E, 749 m a.s.l., meadows and shrubs next to a beech-oak forest, 23.vi.2018, 1 ♀, p/f, YP leg. (BFUS).

***Agapanthia (Synthapsia) kirbyi* (Gyllenhal, 1817)**

Buzovgrad Vill. (Ganev 1985: 151).

New data: 5 km SE Turia Vill., 42°31.786’N 25°11.763’E, 565 m a.s.l., riverside meadows and roadside verges, 24.v.2018, 1 ♂, p/f, DGr leg. (BFUS).

***Agapanthiola leucaspis* (Steven, 1817)**

Stara Zagora - Ayazmoto Place (Angelov 1964: 318, as *Agapanthia leucaspis* Stev.).

New data: Hrishteni Vill., 42°27.212’N 25°42.315’E, 230 m a.s.l., yard of a house, iii.2017, 1 ♂, found dead, DGe leg. (BFUS); N of Lyuyak Vill., 42°31.393’N 25°40.589'E, 578 m a.s.l., stone quarry, rocky grassland near oak-hornbeam forest, 18.v.2018, 1 ♀, DGe leg. (BFUS).

Apodasyini Lacordaire, 1872

***Anaesthetis testacea testacea* (Fabricius, 1781)**

New data: Hrishteni Vill., 42°27.209'N 25°42.218'E, 234 m a.s.l., 14.v.2018, 1 ♀, on a wall near *Juglans regia* L. tree, DGe leg. (BFUS).

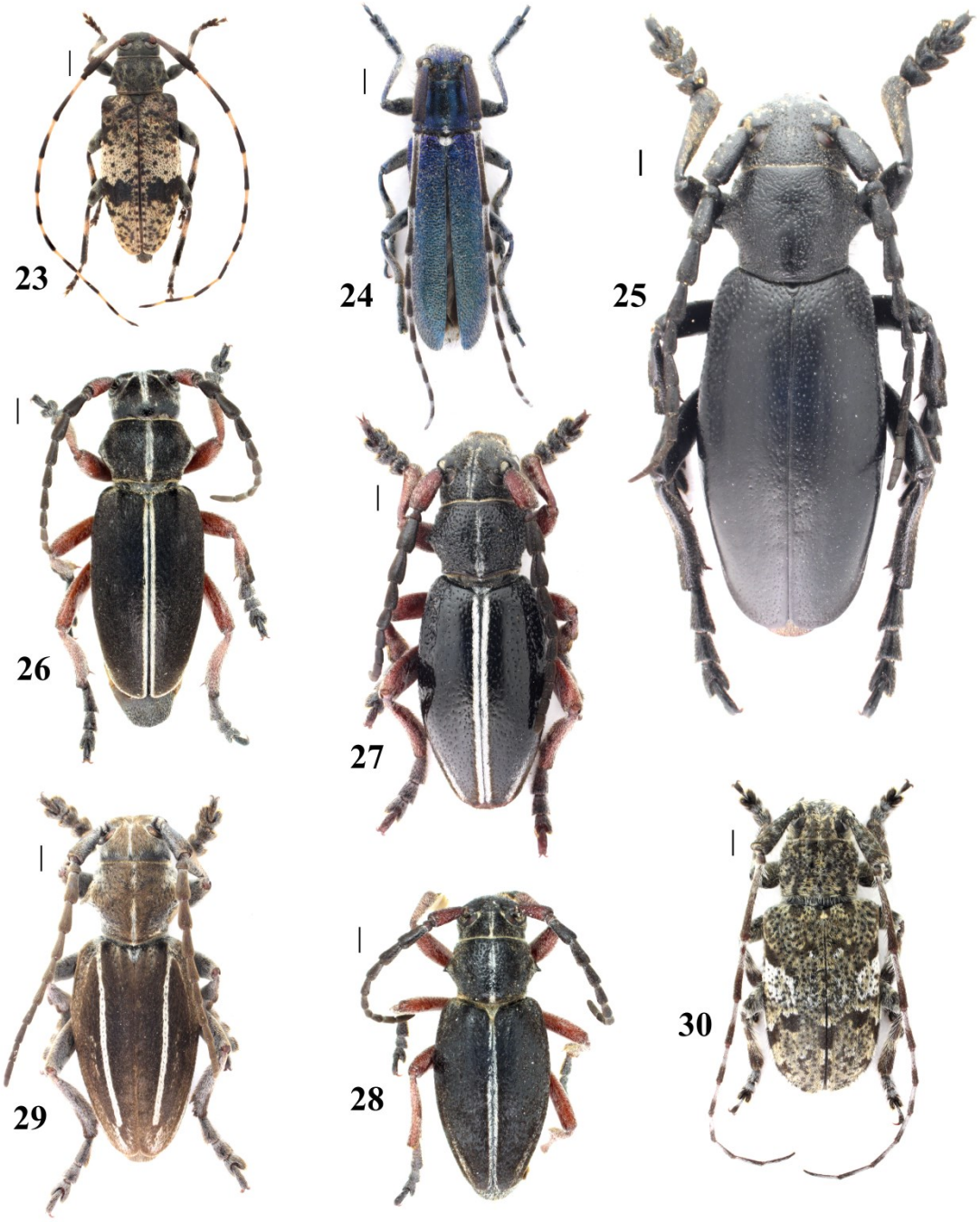

Plate III. 23 – *Leiopus linnei*, Hrishteni Vill., 16.v.2018, female; 24 – *Agapanthia osmanlis*, Pavel Banya, 24.vi.2018, male; 25 – *Dorcadion aethiops aethiops*, 4,5 km SW Chehlare Vill., 23.vi.2018, male; 26 – *D. axillare*, NW Svezhen Hut, 22.iii.2019 - 07.vii.2019, male; 27 – *D. pedestre pedestre*, 2 km NE Mrachenik Vill., 24.v.2018, male; 28 – *D. tauricum tauricum*, NW Stoyan Zaimovo Vill., 23.iii.2019 - 08.vii.2019, male; 29 – *Neodorcadion bilineatum*, SE Beguntsi Vill., 23.v.2018, male; 30 – *Mesosa nebulosa nebulosa*, 3,5 km NW Babek Vill., 23.vi.2018, male. Scale bars: 1 mm.

Dorcadionini Swainson, 1840

***Dorcadion (Carinatodorcadion) aethiops aethiops* (Scopoli, 1763)**

Buzovgrad Vill. (Ganev 1985: 150, as *Dorcadion aethiops* Scop.).

New data: 4,5 km SW Chehlare Vill., 42°24.744'N 25°06.337'E, 450 m a.s.l., dirt road, meadows, 23.vi.2018, 1 ♂, on the ground, DGr & YP leg. (BFUS) (**Plate III, 25**).

***Dorcadion (Carinatodorcadion) fulvum erythropterum* Fischer von Waldheim, 1823**

Starozagorski bani Vill. (Angelov 1964: 317, as *Dorcadion fulvum* Scop.).

New data: N of Hrishteni Vill., 42°27.742'N 25°42.353'E, 310 m a.s.l., on a dirt road near deciduous trees, 03.vi.2018, 1 ♀, on the ground, DGe leg. (BFUS).

******Dorcadion (Cribridorcadion) axillare* Küster, 1847**

New data: NW Svezhen Hut, 42°31.050'N 25°02.517'E, 1008 m a.s.l., pasture, mountain ridge, 22.iii. - 07.vii.2019, 1 ♂, pitfall trap, TT & NK leg. (BFUS) (**Plate III, 26**).

******Dorcadion (Cribridorcadion) pedestre pedestre* (Poda von Neuhaus, 1761)**

New data: 1 km SW Turia Vill., 42°33.862'N 25°10.386'E, 480 m a.s.l., roadside verges, 23.iv.2018, 3 ♂♂, 1 ♀, in copula on the ground and under stones, DGr leg. (BFUS); 1 km SW Turia Vill., 42°33.862'N 25°10.386'E, 480 m a.s.l., meadows and roadside verges, 24.v.2018, 3 ♂♂, 2 ♀♀, on the ground, DGr & YP leg. (BFUS); 2 km NE Mrachenik Vill., 42°30.260'N 24°59.074'E, 717 m a.s.l., roadside meadows and shrubs, 24.v.2018, 1 ♂, 1 ♀, on the ground, DGr leg. (BFUS) (**Plate III, 27**); 3 km NE Mrachenik Vill., 42°30.102'N 24°59.900'E, 805 m a.s.l., roadside verges and an oak forest, 24.v.2018, 1 ♂, 2 ♀♀, on the ground, DGr & YP leg. (BFUS); Chirpan heights, NW Stoyan Zaimovo Vill., 42°21.033'N 25°20.667'E, 406 m a.s.l., boundary of alfalfa field adjacent to tree and shrub lines, 23.iii. - 08.vii.2019, 2 ♂♂, pitfall trap, TT & NK leg. (BFUS); Chirpan heights, NW Stoyan Zaimovo Vill., 42°21.217'N 25°20.767'E, 435 m a.s.l., abandoned pasture with solitary trees and shrubs (*Pyrus* sp., *Malus* sp., *Prunus cerasifera* Ehrh., *Prunus spinosa* L., *Quercus* sp., *Rubus* sp.), 23.iii. - 08.vii.2019, 1 ♂, 2 ♀♀, pitfall trap, TT & NK leg. (BFUS).

******Dorcadion (Cribridorcadion) tauricum tauricum* Waltl, 1838**

New data: Chirpan heights, NW Stoyan Zaimovo Vill., 42°21.033'N 25°20.667'E, 406 m a.s.l., boundary of alfalfa field adjacent to tree and shrub lines, 23.iii. - 08.vii.2019, 1 ♂, pitfall trap, TT & NK leg. (BFUS) (**Plate III, 28**).

***Neodorcadion bilineatum* (Germar, 1824)**

Buzovgrad Vill. (Ganev 1985: 150, 1986: 310).

New data: 2,5 km SE Domlyan Vill., 42°30.764'N 24°55.321'E, 448 m a.s.l., meadows and shrubs next to an oak forest, 23.iv. - 23.v.2018, 1 ♀, pitfall trap, DGr & YP leg. (BFUS); Stara Zagora, 42°25.910'N 25°36.787'E, 296 m a.s.l., 30.iv.2018, 1 ♂, DGe leg. (BFUS); Hrishteni Vill., 42°27.063N 25°42.153'E, 202 m a.s.l., grasses next to a dirt road, 12.v.2018, 1 ♂, DGe leg. (BFUS); SE Beguntsi Vill., near Byala Reka Riv., 42°32.574'N 24°53.249'E, 322 m a.s.l., dirt road, 23.v.2018, 2 ♂♂, 1 ♀, on the ground, DGr & YP leg. (BFUS) (**Plate III, 29**); 1 km SW Turia Vill., 42°33.862'N 25°10.386'E, 480 m a.s.l., meadows and roadside verges, 24.v.2018, 1 ♀, on the ground, DGr & YP leg. (BFUS); Svezhen Vill., 42°30.292'N 25°01.540'E, 747 m a.s.l., riverside vegetation, 24.v.2018, 1 ♀, DGr leg. (BFUS); Hrishteni Vill., 42°27.212'N 25°42.315'E, 230 m a.s.l., yard of a house, 03.vi.2018, 1 ♀, in spider web, DGe leg. (BFUS); Svezhen Vill., 42°30.309'N 25°01.505'E, 750 m a.s.l., on the road, 21.vii.2018, 1 ♂, DGr leg. (BFUS); Chirpan heights, NW Veren Vill., 42°21.317'N 25°10.783'E, 353 m a.s.l., abandoned pasture with *Paliurus spina-christi* Mill. and *Opuntia*

sp., 23.iii. - 08.vii.2019, 1 ♂, pitfall trap, TT & NK leg. (BFUS); Chirpan heights, NW Veren Vill., 42°21.550'N 25°10.617'E, 366 m a.s.l., black locust (*Robinia pseudoacacia* L.) stands on sandy soil, 23.iii. - 08.vii.2019, 1 ♀, pitfall trap, TT & NK leg. (BFUS); the same locality, but 08.vii. - 10.xi.2019, 1 ♀, pitfall trap, TT & NK leg. (BFUS); Chirpan heights, NW Stoyan Zaimovo Vill., 42°21.033'N 25°20.667'E, 406 m a.s.l., boundary of alfalfa field adjacent to tree and shrub lines, 23.iii. - 08.vii.2019, 3 ♂♂, 3 ♀♀, pitfall trap, TT & NK leg. (BFUS); the same locality, but 08.vii. - 10.xi.2019, 3 ♂♂, 1 ♀, pitfall trap, TT & NK leg. (BFUS).

***Neodorcadion exornatum* (Frivaldszky von Frivald, 1835)**

Buzovgrad Vill. (Ganev 1985: 150; 1986: 310).

Exocentrini Pascoe, 1864

***Exocentrus adspersus* Mulsant, 1846**

Turia Vill. (Kantardjiewa-Minkowa 1934: 137); rev.: Turia [in Cyrillic]/21.6.[19]07 [without collector's name], 1 ex. (NMNHS).

******Exocentrus punctipennis punctipennis* Mulsant & Guillebeau, 1856**

New data: Hrishteni Vill., 42°27.212'N 25°42.315'E, 230 m a.s.l., yard of a house, 12.vi.2018, 1 ♂, on lamp, DGe leg. (BFUS); the same locality, but 14.vi.2018, 1 ♀, on lamp, DGe leg. (BFUS) (**Plate IV, 31**).

Lamiini Latreille, 1825

******Lamia textor* (Linnaeus, 1758)**

New data: Svezhen Vill., 42°30.297'N 25°01.551'E, 750 m a.s.l., on the road, 23.v.2018, 1 ♂, on the road, DGr leg. (BFUS).

******Morimus asper funereus* Mulsant, 1863**

New data: Turia [in Cyrillic]/25.viii.[18]98]/Col. D. Ioakimov, 1 ♂ (NMNHS); Svezhen Vill., 42°29.544'N 25°02.220'E, 780 m a.s.l., 22.iv.2018, 1 ♂, 1 ♀, on the road, DGr leg. (BFUS); NW Svezhen Vill., 42°30.650'N 25°00.641'E, 749 m a.s.l., edge of a beech-oak forest, 25.v. - 23.vi.2018, 1 ♀, pitfall trap, DGr & YP leg. (BFUS); 3 km NW Gorno Novo Selo Vill., near Kaleto Place, 42°28.477'N 25°13.304'E, 810 m a.s.l., cutting area, 24.vi.2018, 1 ♂, on the road, DGr leg. (BFUS); near Kavakliyka Chalet, 42°29.143'N 25°13.321'E, 957 m a.s.l., 24.vi.2018, 1 ♂, on the road, DGr leg. (BFUS); Svezhen Vill., 42°29.908'N 25°01.870'E, 770 m a.s.l., 21.vii.2018, 1 ♂, on the road, DGr leg. (BFUS); NW Svezhen Hut, 42°31.983'N 25°02.083'E, 898 m a.s.l., deciduous forest of beech, oak and hornbeam, 07.vii. - 11.xi.2019, 1 ♀, pitfall trap, TT & NK leg. (BFUS); E Svezhen Hut, 42°30.600'N 25°04.433'E, 975 m a.s.l., beech forest, 07.vii. - 11.xi.2019, 1 ♀, pitfall trap, TT & NK leg. (BFUS); NW Svezhen Hut, 42°31.000'N 25°02.633'E, 1015 m a.s.l., Scots pine (*Pinus sylvestris* L.) stands mixed with spruce, Douglas fir and beech, 07.vii. - 11.xi.2019, 1 ♂, pitfall trap, TT & NK leg. (BFUS).

Notes: The species is included in Annex II of the Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (Council of Europe 1992).

Mesosini Mulsant, 1839

******Mesosa (Aplocnemia) nebulosa nebulosa* (Fabricius, 1781)**

New data: 3,5 km NW Babek Vill., 42°28.501'N 25°03.900'E, 696 m a.s.l., dirt road through an oak forest, cutting area, 23.vi.2018, 1 ♂, 1 ♀, on cut oak branches, in copula, DGr leg. (BFUS) (**Plate III, 30**).

Monochamini Gistel, 1848

***Monochamus sartor* (Fabricius, 1787)**

Buzovgrad Vill. (Ganev 1985: 151).

Phytoeciini Mulsant, 1839

******Oberea (Oberea) linearis* **(Linnaeus, 1760)**

New data: S of Shanovo Vill., 42°31.867'N 25°38.698'E, 434 m a.s.l., oak-hornbeam forest, 15.v.2018, 1 ♀, DGe leg. (BFUS) (**Plate IV, 33**).

******Phytoecia (Helladia) millefolii* **(Adams, 1817)**

New data: N of Dalboki Vill., 42°29.500'N 25°46.222'E, 330 m a.s.l., rocks and shrubs near a small river, 06.v.2018, 1 ♂, DGe leg. (BFUS) (**Plate IV, 32**).

Notes: Rare species in Bulgaria (Migliaccio *et al.* 2007), reported from several localities along the Black Sea coast (Simandl 2002, Rapuzzi & Georgiev 2007, Georgiev *et al.* 2015). The present record is the first one from the country inland territory.

***Phytoecia (Opsilia) coerulescens coerulescens* (Scopoli, 1763)**

Starozagorski bani Vill., Stara Zagora - Ayazmoto Place (Angelov 1964: 318, as *Phytoecia coerulescens* Scop.); Buzovgrad Vill. (Ganev 1985: 152, as *Phytoecia coerulescens* (Scop.).

New data: near Zelenikovo Vill., 42°24.943'N 25°04.815'E, 334 m a.s.l., roadside verges, 24.v.2018, 1 ♂, p/f, DGr leg. (BFUS) (**Plate IV, 34**); 1 km SW Turia Vill., 42°33.862'N 25°10.386'E, 480 m a.s.l., meadows and roadside verges, 24.v.2018, 1 ♀, p/f, YP leg. (BFUS); near Kavakliyka Chalet, 42°29.123'N 25°13.411'E, 975 m a.s.l., meadows, 24.vi.2018, 1 ♀, p/f, DGr & YP leg. (BFUS); the same locality, but 22.vii.2018, 1 ♀, found dead on Boraginaceae, DGr leg. (BFUS).

******Phytoecia (Phytoecia) icterica* **(Schaller, 1783)**

New data: near Babek Vill., 42°26.262'N 25°04.794'E, 388 m a.s.l., meadows, 22.iv.2018, 1 ♀, YP leg. (BFUS) (**Plate IV, 35**); Hrishteni Vill., 42°27.063'N 25°42.153'E, 227 m a.s.l., ruderal vegetation near outbuildings, 29.iv.2018, 1 ♂, DGe leg. (BFUS); near Zelenikovo Vill., 42°24.969'N 25°04.815'E, 330 m a.s.l., roadside verges, 24.v.2018, 1 ♀, p/f, YP leg. (BFUS).

******Phytoecia (Phytoecia) pustulata pustulata* **(Schrank, 1776)**

New data: SE Beguntsi Vill., near Byala Reka Riv., 42°32.601'N 24°53.247'E, 321 m a.s.l., riverside meadows, 23.v.2018, 1 ♀, p/f, DGr & YP leg. (BFUS); 1 km SW Turia Vill., 42°33.862'N 25°10.386'E, 480 m a.s.l., meadows and roadside verges, 24.v.2018, 1 ♀, p/f, YP leg. (BFUS); 5 km SE Turia Vill., 42°31.786'N 25°11.763'E, 565 m a.s.l., riverside meadows and roadside verges, 24.v.2018, 1 ♀, p/f, DGr & YP leg. (BFUS).

***Phytoecia (Phytoecia) virgula* (Charpentier, 1825)**

Starozagorski bani Vill. (Angelov 1964: 318).

New data: S of Shanovo Vill., 42°31.867'N 25°38.698'E, 434 m a.s.l., oak-hornbeam forest, 15.v.2018, 1 ♀, DGe leg. (BFUS); 3 km S Turia Vill., 42°32.601'N 25°10.937'E, 538 m a.s.l., hillside, meadows, roadside verges, 24.v.2018, 1 ♀, p/f, DGr & YP leg. (BFUS).

******Phytoecia (Pilemia) hirsutula hirsutula* **(G. F. Frölich, 1793)**

New data: Chirpan heights, Bratya Daskalovi Vill., 42°17.875'N 25°13.297'E, 241 m a.s.l., grasses and shrubs, edge of pine forest (*Pinus nigra* J. F. Arnold), 26.iv.2018, 1 ♂, DGe leg. (BFUS); Hrishteni Vill., 42°27.212'N 25°42.315'E, 231 m a.s.l., yard of a house, 08.v.2018, 1 ♀, DGe leg. (BFUS) (**Plate IV, 36**).

Pogonocherini Mulsant, 1839

***Pogonocherus (Pogonocherus) hispidulus* (Piller & Mitterpacher, 1783)**

Turia Vill. (Kantardjiewa-Minkowa 1934: 136); rev.: Turia [in Cyrillic]/21.VI.1907 [without collector's name], 1 ex. (NMNHS).

***Pogonocherus (Pogonocherus) hispidus* (Linnaeus, 1758)**

New data: Beter Peak, 42°30.687'N 25°37.773'E, 809 m a.s.l., deciduous forest with *Quercus* sp., *Carpinus betulus* L., *Acer* sp., rocks and forest glades with *Paeonia* sp., 28.v.2018, 1 ♀, DGe leg. (BFUS) (**Plate IV, 37**).

Notes: Regarded as rare species in Bulgaria (Migliaccio *et al.* 2007), reported from Vitosha Mts., Central Balkan Range, Maleshevska Planina Mts. (Migliaccio *et al.* 2007) and recently from Western Rhodopes Mts. (Georgiev 2020) and Balchik (Gradinarov *et al.* 2020).

***Pogonocherus (Pogonocherus) perroudi* Mulsant, 1839**

New data: Hrishteni Vill., 42°27.223'N 25°42.311'E, 230 m a.s.l., yard of a house, 16.ii.2018, 1 ♀, on the wall of a house, DGe leg. (BFUS) (**Plate IV, 38**).

Notes: Rare species in Bulgaria, previously reported from Pirin Mts. (Rozhen Monastery) and from Sacar Mts. (Cherepovo Vill. and Pastrogor Vill.) (Migliaccio *et al.* 2007).

Saperdini Mulsant, 1839

***Saperda (Compsidia) populnea populnea* (Linnaeus, 1758)**

Buzovgrad Vill. (Ganev 1985: 151, as *Saperda populnea* L.).

***Saperda (Compsidia) quercus quercus* Charpentier, 1825**

Gorni Domlyan Vill. (Doychev & Georgiev 2004: 170, as *Saperda quercus* Charpentier, 1825).

***Saperda (Lopezcolonia) scalaris scalaris* (Linnaeus, 1758)**

New data: Hrishteni Vill., 42°27.223'N, 25°42.311'E, yard of a house, 20.vi.2019, 1 ex. (photo by D. Georgiev).

***Saperda (Saperda) carcharias* (Linnaeus, 1758)**

Buzovgrad Vill. (Ganev 1985: 151).

Tetropini Portevin, 1927

***Tetrops praeustus praeustus* (Linnaeus, 1758)**

New data: 5 km SW Chehlare Vill., 42°24.709'N 25°06.163'E, 433 m a.s.l., edge of a deciduous forest, 22.iv.2018, 2 ♂♂, 2 ♀♀, at flight, DGr & YP leg. (BFUS) (**Plate IV, 39**); Hrishteni Vill., 42°27.212'N 25°42.315'E, 230 m a.s.l., yard of a house, 07.vi.2019, 1 ♀, DGe leg. (BFUS).

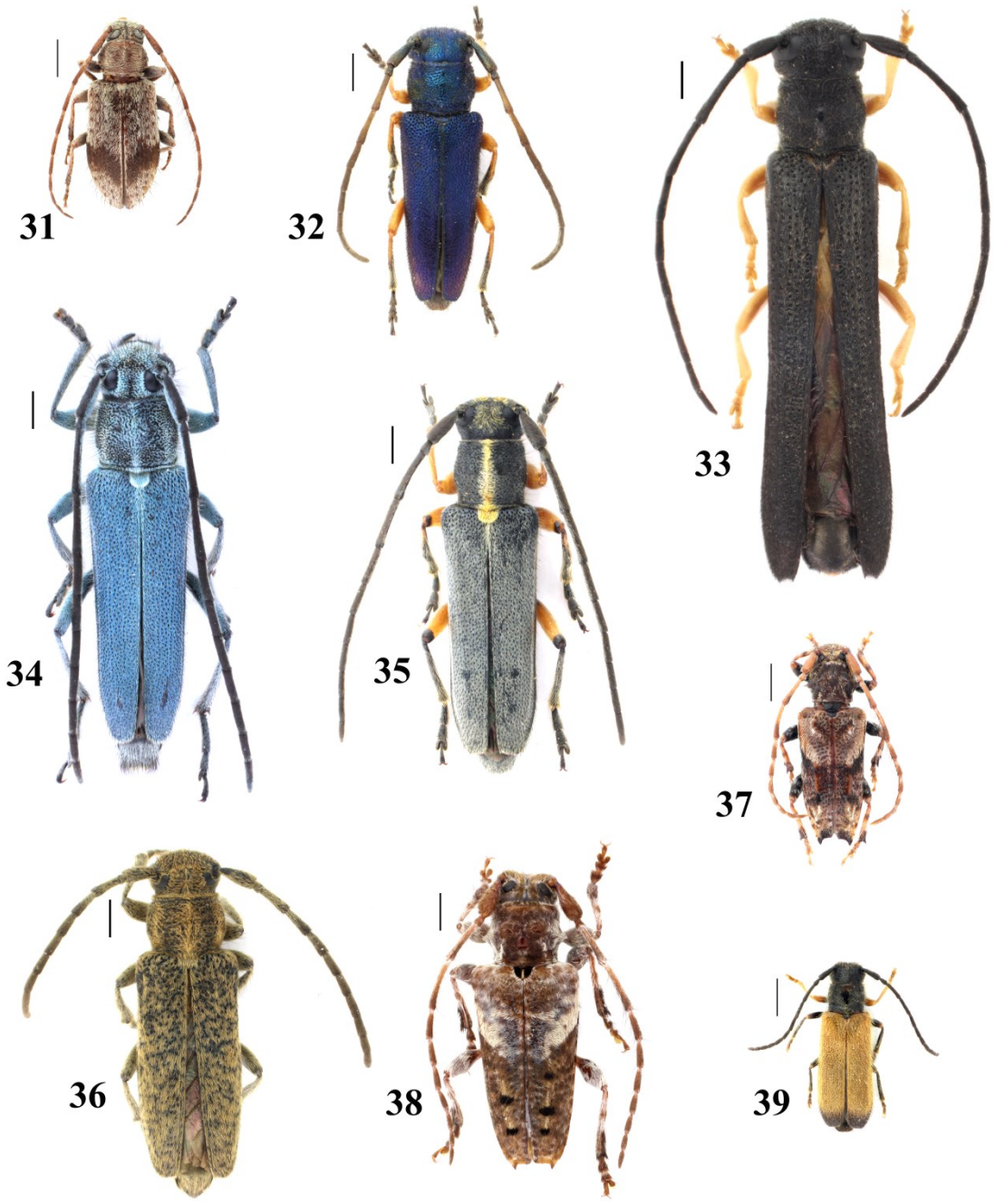

Plate IV. 31 – *Exocentrus punctipennis punctipennis*, Hrishteni Vill., 14.vi.2018, female; 32 – *Phytoecia millefolii*, N of Dalboki Vill., 06.v.2018, male; 33 – *Oberea linearis*, S of Shanovo Vill., 15.v.2018, female; 34 – *Phytoecia coerulescens coerulescens*, Zelenikovo Vill., 24.v.2018, male; 35 – *Phytoecia icterica*, Babek Vill., 22.iv.2018, female; 36 – *Phytoecia hirsutula hirsutula*, Hrishteni Vill., 08.v.2018, female; 37 – *Pogonocherus hispidus*, Beter Peak, 28.v.2018, female; 38 – *Pogonocherus perroudi*, Hrishteni Vill., 16.ii.2018, female; 39 – *Tetrops praeustus praeustus*, 5 km SW Chehlare Vill., 22.iv.2018, female. Scale bars: 1 mm.

Conclusions

As a result of the present study a total of 98 species of the family Cerambycidae are reported for the Sarnena Gora Mts. Eighteen species are known only from literature records and 55 are new species records for the study area. For 82 of the species new locality data are reported. The new locality records of *Cerambyx miles* and *Rosalia alpina* are revised museum materials, the other 80 records are recently collected material. Of particular importance in terms of their distribution in Bulgaria are findings of *Stenurella melanura samai*, *Leiopus linnei*, *Agapanthia osmanlis*, *Phytoecia millefolii*, *Pogonocherus hispidus* and *P. perroudi*. The species of conservation concern, recorded for Sarnena Gora Mts. are *Rosalia alpina alpina* (old literature data and revised museum materials) and *Morimus asper funereus* (new data).

In comparison to other extensively studied mountain regions in Bulgaria the number of the established species in Sarnena Gora Mts. is close to Belasitsa Mts. (110 species and subspecies), Western Stara Planina Mts. (107 species and subspecies) and Vitosha Mts. (122 species and subspecies) (refference data according to Georgiev *et al.* 2019). Nevertheless the species composition of the family from Sarnena Gora is not yet sufficiently studied. Additions are expected still for Bratan region as well as for the other regions of the mountain. The Chirpan Heights are the most poorly studied region of the mountain with only four recorded species - *Stenurella bifasciata*, *Dorcadion pedestre*, *Dorcadion tauricum* and *Phytoecia hirsutula*.

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