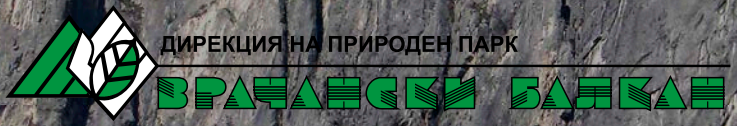
Faunistic diversity of Vrachanski Balkan Nature Park. Part 2

ZooNotes Supplement 7



Dimitar Bechev and Dilian Georgiev
Editors

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FAUNISTIC DIVERSITY OF VRACHANSKI BALKAN NATURE PARK PART 2

ФАУНИСТИЧНО РАЗНООБРАЗИЕ НА ПРИРОДЕН ПАРК ВРАЧАНСКИ БАЛКАН ЧАСТ 2

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ЧАСТ 2

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PART 2

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

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Foreword

This second part of the compendium* again a joint edition of the Direction of Vrachanski Balkan Nature Park and the ZooNotes journal includes 11 articles, containing information about 1030 species of Cestoda, Nematomorpha, Gastropoda, Myriapoda, Odonata, Psocoptera, Coleoptera: Carabidae and Cerambycidae, Hymenoptera, Diptera and Chiroptera, and a synopsis article on the faunistic diversity of the Vrachanski Balkan Nature Park.

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*Part 1: Bechev, D. & Georgiev, D. (2016) (Eds.) *Faunistic diversity of Vrachanski Balkan Nature Park. ZooNotes*, Supplement 3, Plovdiv University Press, 328 pp.

The Editors

Предговор

Тази втора част на сборника*, съвместно издание на Дирекция на природен парк Врачански Балкан и списание ZooNotes, включва 11 статии, съдържащи информация за 1030 вида Cestoda, Nematomorpha, Gastropoda, Myriapoda, Odonata, Psocoptera, Coleoptera: Carabidae и Cerambycidae, Hymenoptera, Diptera и Chiroptera, и една обобщаваща статия върху фаунистичното разнообразие на Природен парк Врачански Балкан.

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Review of cestodes (Platyhelminthes: Cestoda) recorded from birds in Vrachanska Planina Mountains

MARGARITA MARINOVA

Abstract. A review of cestodes (Platyhelminthes: Cestoda) recorded from birds in Vrachanska Planina Mountains is presented. A total of 20 species were reported as one of them has been identified at the generic level only. They belong to 15 genera and 5 families of the order Cyclophyllidea. As hosts, 15 species of bird from 12 families and 5 orders were reported. A host-parasite list is presented. The cyclophyllidean cestode species from birds recorded in the Vrachanska Planina Mountains represent 8.8% from the species recorded in Bulgaria.

Kew words: Cestoda, birds, review, Vrachanska Planina Mountains, Bulgaria.

Introduction

According to Stoyanov & Donchev (2016), the species diversity of birds on the territory of the Vrachanski Balkan Nature Park is represented by 280 species of birds, 131 of them nesting in the mountain. Despite the well-presented diversity of birds in the region, their cestode fauna has not been sufficiently studied. There are only few faunistic records of cestodes from birds in the studied region (Paspalev *et al.* 1969; Paspalev & Paspaleva 1972; Vasilev 1973; Petrova 1977).

In addition, a part of the primary data obtained by the above-mentioned studies has also been presented in review publications on the cestodes from the fauna of Bulgaria. These are: cestode fauna of wild birds in Bulgaria (Kornyushin *et al.* 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), the PhD thesis of the cestodes of the family Hymenolepididae from birds of the families Anatidae and Rallidae in Bulgaria (Marinova 2016).

The aim of the present review is to summarise the information about cestode parasites of birds, which have been recorded in Vrachanska Planina Mts. until 2017.

Materials and Methods

The review summarises all data on cestode parasites of birds recorded from Vratsa region. In view of the biological characteristics of the final hosts as well as the scarce data in the helminthological literature, some adjacent territories within a range of up to 20 km around Vrachanska Planina Mts. are also included in this survew, e.g. Varshets, Klisura Monastery (Varshets Region), the villages of Stoyanovo (Varshets Region), Zamphirovo and Borovtsi (Berkovitsa Region).

The cestode species are 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 birds follows Fauna Europaea (Roselaar 2004).

Results

List of cestode species from birds in the Vrachanska Planina Mountains

Phylum Platyhelminthes
Class Cestoda
Order Cyclophyllidea van Beneden in Braun, 1900
Family Davaineidae Fuhrmann, 1907
Genus *Fernandezia* Lopez-Neyra, 1936

(1) *Fernandezia spinosissima* (von Linstow, 1894) Lopez-Neyra, 1936

Synonym: *Raillietina* (*Skrjabinia*) *spinosissima* (von Linstow, 1893).

Report: Paspalev & Paspaleva (1972).

Host: *Turdus merula* L.

Locality: Varshets (Vratsa Region).

General distribution: Palearctic, Indomalaya (India) (Schmidt 1986; Kornyushin 1989; Movsesyan 2003).

Remarks: The synonymy of *Raillietina* (*Skrjabinia*) *spinosissima* and *Fernandezia spinosissima* has been proposed by Lopez-Neyra (1936).

Genus *Skrjabinia* Fuhrmann, 1920

(2) *Skrjabinia polyuterina* (Fuhrmann, 1909) Fuhrmann, 1920

Synonym: *Raillietina* (*Skrjabinia*) *polyuterina* (Fuhrmann, 1909) Fuhrmann, 1920.

Report: Paspalev & Paspaleva (1972).

Host: *Coturnix coturnix* (L.)

Locality: Borovtsi, Zamphirovo (Bercovitsa Region).

General distribution: Palearctic-Paleotropical: Russia (Mordovia), Western and Central Europe, Central Asia, Africa, India (Schmidt 1986; Movsesyan 2003).

Family Dilepididae Fuhrmann, 1907
Genus *Choanotaenia* Railliet, 1896

(3) *Choanotaenia* sp.

Report: Paspalev & Paspaleva (1972).

Host: *Lanius collurio* L.

Locality: Varshets (Vratsa Region).

Remarks: Paspalev & Paspaleva (1972) mentioned that the species identification of this material has not been possible due to the unsufficient condition of material containing immature specimens only.

Genus *Dilepis* Weinland, 1858

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

Synonym: *Dilepis brachyarthra* Cholodkowsky, 1906 [2].

Reports: [1] Paspalev *et al.* (1969); [2] Paspalev & Paspaleva (1972).

Hosts: *Garrulus glandarius* (L.) [1, 2]; *Turdus merula* [2]; *Turdus viscivorus* L. [2].

Locality: Varshets, Lakatnik [2]; Vratsa [1, 2].

General distribution: Holarctic, parts of Indomalaya (Matevosyan 1963; Spasskaya & Spasskii 1977; Schmidt 1986; Georgiev 1991).

Remarks: The finds of *Turdus merula* from Varshets, published by Paspalev & Paspaleva (1972) as *Dilepis brachyarthra* Cholodkowsky, 1906 should also be referred to this species (see Georgiev & Genov 1987; Georgiev 1991).

Georgiev (1991) re-examines the materials referred to *D. brachyarthra* and *D. turdi* in the publications of Bulgarian authors (Paspalev & Paspaleva 1965, 1967, 1972, Petrova 1977, 1978) and mentioned that there are no significant differences between the materials from Bulgaria referred to *D. undula*, *D. brachyarthra* and *D. turdi*.

Genus *Monopylidium* Fuhrmann, 1899

(5) *Monopylidium galbulae* (Gmelin, 1790) Skryabin, 1914

Synonym: *Anomotaenia galbulae* (Gmelin, 1790) Fuhrmann, 1932.

Report: Paspalev & Paspaleva (1972).

Host: *Oriolus oriolus* (L.).

Locality: Borovtsi (Bercovitsa Region).

General distribution: Palearctic, Indomalaya (India) (Georgiev 1991).

(6) *Monopylidium musculosum* (Fuhrmann, 1896) Fuhrmann, 1899

Synonym: *Choanotaenia musculosa* (Fuhrmann, 1896) Fuhrmann, 1932.

Report: Paspalev & Paspaleva (1972).

Host: *Sturnus vulgaris* L.

Locality: Vratsa, Varshets (Vratsa Region).

General distribution: Holarctic (Matevosyan 1963; Spasskaya & Spasskii 1977; Schmidt 1986).

(7) *Monopylidium cf. parinum* (Dujardin, 1845) Spasskaja et Spassky, 1977

Synonym: *Choanotaenia passerina* (Fuhrmann, 1907) of Paspalev & Paspaleva (1972) in part [1,2];.

Report: [1] Paspalev & Paspaleva (1972); [2] Georgiev (1991).

Host: *Parus major* L. [1, 2].

Locality: Varshets (Vratsa Region).

Remarks: Paspalev & Paspaleva (1972) recorded the species „*Choanotaenia passerina* (Fuhrmann, 1907)“ from *Parus major, Turdus philomelos* (= *Turdus ericetorum*), *T. viscivorus* and *Passer domesticus* from various localities in Bulgaria. These specimens have been re-examined and further Georgiev (1991) recognised the specimens from *Parus major* from Varshets as belonging to another species, i.e. *Monopylidium* cf. *parinum*. The author considered that probably the two dilepidid species *Monopylidium passerinum* and *M. parinum* represent complex of several species and the clarification of their taxonomic status needs a detailed taxonomic revision (Georgiev, 1991).

Genus *Spasspasskya* Bona, 1994

(8) *Spasspasskya passerum* (Joyeux & Timon-David, 1934) Bona, 1994

Synonyms: *Monopylidium passerum* (Joyeux et Timon- David, 1934) Spasskaya et

Spassky, 1977.

Report: Georgiev (1991).

Host: *Turdus merula.*

Locality: Klisura Monastery (Varshets Region).

General distribution: Palearctic (Spasskaya & Spassky 1977; Schmidt 1986).

Remarks: These specimens from Klisura monastery have been collected in 1964 by K. Petrova and labelled as „*Choanotaenia unicoronata*". Subsequently, they are re-examined and reidentified as „*Monopylidium passerum*" by Georgiev (1991).

Genus *Spiniglans* Yamaguti, 1959

(9) *Spiniglans constricta* (Molin, 1858) Bona, 1994

Synonym: *Anomotaenia constricta* (Molin, 1858) Fuhrmann, 1908.

Report: Paspalev & Paspaleva (1972).

Host: *Turdus merula.*

Locality: Varshets.

General distribution: Sub-cosmopolitan (Holarctic, Neotropical, Afrotropic, Indomalaya) (Matevosyan 1963; Spasskaya & Spassky 1977; Schmidt 1986).

Remarks: The synonymy of *Anomotaenia constricta* and *Spiniglans constricta* has been proposed by Bona (1994).

Genus *Vitta* Burt, 1938

(10) *Vitta rustica* (Neslobinsky, 1911) Baer, 1959

Synonym: *Anomotaenia rustica* Neslobinsky, 1911.

Report: Paspalev & Paspaleva (1972).

Host: *Hirundo rustica* L.

Locality: Stoyanovo (Varshets Region).

General distribution: Palearctic (Georgiev (1991).

Remarks: The synonymy of *Anomotaenia rustica* and *Vitta rustica* has been proposed by Baer (1959).

Family Hymenolepididae (Ariola, 1899) Railliet et Henry, 1909

Genus *Microsomacanthus* Lopez-Neyra, 1942

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

Report: Vasilev (1973).

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

Locality: Vratsa Region.

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

(12) *Microsomacanthus parvula* (Kowalewski, 1904) Spasskaya, 1966

Report: Vasilev (1973).

Host: *Anas platyrhynchos f. dom.*

Locality: Vratsa Region.

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

Genus *Passerilepis* Spassky et Spasskaya, 1954

(13) *Passerilepis crenata* (Goeze, 1782) Sultanov et Spasskaya, 1959

Synonym: *Hymenolepis* (*Dicranotaenia*) *serpentulus* (Schrank, 1788).

Report: Paspalev & Paspaleva (1972).

Host: *Sturnus vulgaris.*

Locality: Varshets, Borovtsi (Vratsa Region).

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

Remarks: The synonymy of *H. serpentulus* and *Passerilepis crenata* has been proposed by Spassky & Spasskaya (1954).

(14) *Passerilepis passeris* (Gmelin, 1790) Spassky et Spasskaya, 1954

Synonym: *Hymenolepis fringillarum* Fuhrmann, 1908.

Report: Paspalev & Paspaleva (1972).

Host: *Parus major.*

Locality: Varshets (Vratsa Region).

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

Remarks: The synonymy of *Hymenolepis fringillarum* and *Passerilepis passeris* has been proposed by Spassky & Spasskaya (1954).

(15) *Passerilepis stylosa* (Rudolphi, 1809) Spassky et Spasskaya, 1954

Synonyms: *Hymenolepis stylosa* (Rudolphi, 1809) [1]; *Hymenolepis* (*Dicranotaenia*) *stylosa* (Rudolphi, 1809) [2].

Reports: [1] Paspalev *et al.* (1969); [2] Paspalev & Paspaleva (1972).

Hosts: *Garrulus glandarius* [1, 2]; *Luscinia megarhynchos* C. L. Brehm [2]; *Pica pica* (L.) [2].

Locality: Varshets, Lakatnik (Vratsa Region) [1]; Vratsa, Vratsa Region [2].

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

Genus *Variolepis* Spassky et Spasskaya, 1954

(16) *Variolepis farciminosa* (Goeze, 1782) Spassky et Spasskaya, 1954

Synonym: *Hymenolepis* (*Dicranotaenia*) *farciminosa* (Goeze, 1782).

Report: Paspalev & Paspaleva (1972).

Host: *Garrulus glandarius.*

Locality: Varshets (Vratsa Region).

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

Family Metadilepididae Spassky, 1959

Genus *Skrjabinoporus* Spassky et Borgarenko, 1960

(17) *Skrjabinoporus merops* (Woodland, 1928) Spassky et Borgarenko, 1960

Synonym: *Lateriporus merops* Woodland, 1928

Report: Paspalev & Paspaleva (1972).

Host: *Merops apiaster* L.

Locality: Zamphirovo (Berkovitsa Region).

General distribution: Palearctic and Afrotropic Region (Schmidt 1986; Kornyushin 1989).

Family Paruterinidae Fuhrmann, 1907

Genus *Neyraia* Joyeux & Timon-David, 1934

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

Report: Paspalev & Paspaleva (1972).

Host: *Upupa epops* L.

Locality: Vratsa Region.

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

Genus *Spasskyterina* Kornyushin, 1989

(19) *Spasskyterina dunganica* (Skrjabin, 1914) Kornyushin, 1989

Synonym: *Biuterina dunganica* Skrjabin, 1914.

Report: Paspalev & Paspaleva (1972).

Host: *Luscinia megarhynchos.*

Locality: Vratsa.

General distribution: Russia (Schmidt 1986).

Genus *Triaenorhina* Spassky et Shumilo, 1965

(20) *Triaenorhina rectangula* (Fuhrmann, 1908) Spassky et Shumilo, 1965

Synonym: *Biuterina rectangula* Fuhrmann, 1908.

Report: Paspalev & Paspaleva (1972).

Host: *Corasias garrulus* L.

Locality: Stoyanovo (Varshets Region).

General distribution: Palearctic and Afrotropic Region (Mathevossian 1969; Schmidt 1986; Kornyushin 1989; Georgiev & Kornyushin 1994).

Host-parasite checklist

Class Aves

Order Anseriformes

Family Anatidae

A. platyrhynchos L. *f. dom.*

Microsomacanthus abortiva

Microsomacanthus parvula

Order Coraciiformes

Family Coraciidae

Corasias garrulus L.

Triaenorhina rectangula

Merops apiaster L.

Skrjabinoporus merops

Order Galliformes

Family Phasianidae

Coturnix coturnix (L.)
Skrjabinia polyuterina

Order Passeriformes
Family Corvidae
Garrulus glandarius (L.)
Dilepis undula
Passerilepis stylosa
Variolepis farciminosa
Pica pica (L.)
Passerilepis stylosa
Family Hirundinidae
Hirundo rustica L.
Vitta rustica
Family Laniidae
Lanius collurio L.
Choanotaenia sp.
Family Oriolidae
Oriolus oriolus (L.)
Monopylidium galbulae
Family Paridae
Parus major L.
Monopylidium cf. parinum
Passerilepis passeris
Family Saxicolidae
Luscinia megarhynchos C. L. Brehm
Passerilepis stylosa
Spasskyterina dunganica
Family Sturnidae
Sturnus vulgaris L.
Monopylidium musculosum
Passerilepis crenata
Family Turdidae
Turdus merula L.
Dilepis undula
Fernandezia spinosissima
Spasspasskya passerum
Spiniglans constricta
Turdus viscivorus L.
Dilepis undula
Order Upupiformes
Family Upupidae
Upupa epops L.
Neyraia intricata

Discussion

As seen from the above syrvey, 20 cestode species were recorded from the Vrachanska Planina Mts and some adjacent areas. The cestodes recorded belong to 16 genera and 5 families. As definitive hosts, 15 bird species have been recorded. They belong to 5 orders and 12 families.

Due to the large number of birds reported from the region (Stoyanov & Donchev, 2016) and the large number of avian cestodes reported in Bulgaria (Nikolov *et al.* 2010; Marinova *et al.* 2015; Marinova 2016), it could be assumed that the expected number of species of this group is probably much larger. Further studies are needed on new avian hosts of cestodes in the Vrachanska Planina Mts.

According to Nikolov *et al.* (2010), Marinova *et al.* (2015) and Marinova (2016) 228 cyclophyllidean cestodes from birds were recorded for the fauna of Bulgaria. The cestodes species recorded in the Vrachanska Planina represent 8.8% of the fauna of the group in Bulgaria.

The majority of the species recorded in Vrachanska Planina Mountains (80%) are characterised by large geographical ranges (Palearctic-Paleotropical, sub-cosmopolitan, Palearctic, Palearctic-Oriental, Palearctic-Afrotropic, Holarctic) which is probably due to the biological features of their final hosts, their diversity, migrations and extensive areas.

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Преглед на цестоди (Platyhelminthes: Cestoda), съобщени от птици от Врачанска планина

МАРГАРИТА МАРИНОВА

(Резюме)

Представен е преглед на видовете цестоди (Platyhelminthes: Cestoda), съобщени от птици от Врачанска планина и някои прилежащи територии. Съобщени са 20 вида цестоди, един от които е определен само до ниво род. Те принадлежат към 16 рода и 5 семейства на разред Cyclophyllidea. Петнайсет вида птици от 12 семейства и 5 разреда са съобщени като гостоприемници на установените видове цестоди. Представени са също и данни за общото разпространение на установените видове. Включен е списък на гостоприемниците на цестодите, установени във Врачанска планина. Установените видове цестоди представляват 8.8% от общия брой видове, съобщени за България.

Bechev, D. & Georgiev, D. (Eds.),
Faunistic diversity of Vrachanski Balkan Nature Park. Part 2
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Records of horsehair worms (Nematomorpha) in Vrachanski Balkan Nature Park

Dimitar Bechev

Abstract. Records of two specimens of Gordiida, *Gordius* sp. and 1 unidentified female, are given.

Key words: *Gorgius* sp., Vrachanska Planina Mts., Bulgaria.

Introduction

Knowledge of the phylum Nematomorpha in Bulgaria is still limited. In the papers of Konsuloff (1921) and Angelov (1959) 7 species have been reported for the country. The valid names of these species according Schmidt-Rhaesa (2013a, b) are as follow: *Gordius pioltii* Camerano, 1887, *Gordius villoti* Rosa, 1882, *Gordionus alpestris* (Villot, 1885), *Gordionus violaceus* (Baird, 1853), *Paragordius stylosus* (Linstow, 1883), *Parachordodes pustulosus* (Baird, 1853) and *Paragordius tricuspidatus* (Dufour, 1828), the first 6 species are after Konsuloff (1921) and the 7-th, after Angelov (1959). No any information for the West Stara Planina Mts. and Vrachanska Planina Mts. is available.

Results

Two specimens of Gordiida are established from the author in Vtachanska Planina Mts.

***Gordius* sp.**

Vtachanska Planina Mts., S of Vratsa Town, Voyvodin Dol, very small stream, 5.03. 1988, 1 male.

Gordiida gen. sp.

Vtachanska Planina Mts., S of Vratsa Town, stream under Skaklia Waterfall, 3.05.2010, 1 female (observation only).

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Регистриране на нематоморфни червеи (Nematomorpha) в Природен парк Врачански Балкан

Димитър Бечев

(Резюме)

За първи път се съобщават за Врачанска планина и Природен парк Врачански Балкан представители на тип Nematomorpha: *Gordius* sp. и един неидентифициран женски екземпляр.

Bechev, D. & Georgiev, D. (Eds.),
Faunistic diversity of Vrachanski Balkan Nature Park. Part 2
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Plovdiv, 2019

New genus and species of minute freshwater snail (Gastropoda) was described from a cave of Vrachanski Balkan Nature Park

Dilian Georgiev

Abstract. A new species of hydrobiid snail was described from Kalna Matnitsa Cave by Georgiev & Glöer (2015). The genus was named after its collector, Ilcho Kolev – *Kolevia*, *K. bulgarica*.

Key words: Gastropoda, aquatic, cave.

Knowledge on the freshwater molluscs of Vrachanska Planina Mts. was represented as a synopsis by Georgiev (2016). After the publication of the first volume of "Faunistic Diversity of Vrachanski Balkan Nature Park", one more species from a new genus was described by Georgiev & Glöer (2015). Till now this species is known only by empty shells from its type locality – Kalna Matnitsa Cave. The genus was named after its collector, Ilcho Kolev – *Kolevia*, *K. bulgarica* Georgiev & Glöer, 2015. It can be considered that this species is local endemic for the underground waters of this mountain massif.

After this find, the number of aquatic molluscs known to the area are 14: 12 species of snails and 2 species of clams.

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Нов за науката род и вид Gastropoda бяха описани от Природен парк Врачански Балкан

Дилян Георгиев

(Резюме)

Нов род и вид сладководен охлюв от семейство Hydrobiidae беше описан от Georgiev & Glöer (2015). Досега е известен само от типовото си находище, пещера Кална Мътница. Родът е именуван на Илчо Колев, който е събрал екземплярите от пещерата. Вероятно този вид е ендемичен за подземните води на Врачанска планина.

Bechev, D. & Georgiev, D. (Eds.),
Faunistic diversity of Vrachanski Balkan Nature Park. Part 2
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Myriapods (Myriapoda) of Vrachanski Balkan Nature Park, NW Bulgaria

PAVEL STOEV, BOYAN VAGALINSKI

Abstract. The present paper summarizes the information on the myriapods of Vrachanski Balkan Nature Park, northwestern Bulgaria. The myriapod fauna of the protected area comprises 38 species which accounts for approximately 15% of the total myriapod fauna of Bulgaria. Class Diplopoda is represented with 19 species from 5 orders and 8 families, and Chilopoda with 19 species from 3 orders and 5 families. Six species are reported as new to the park's territory. The classes Pauropoda and Symphyla remain completely unknown from the studied region.

Key words: centipedes, millipedes, new records.

Introduction

The centipedes and millipedes of Bulgaria are relatively well-studied in taxonomic and faunistic aspects in the course of almost 130 years of scientific surveys. In the last 15 years, several papers summarizing the knowledge of the Bulgarian myriapods have been published, e.g., Stoev (2002, 2007), Vagalinski & Stoev (2007), and Bachvarova *et al.* (2017).

Yet, comprehensive inventories of the myriapod fauna of particular geographic regions in the country are rather few. The works of Stoev (2001, 2003, 2004a) and Vagalinski & Stoev (2011) focus on certain geographical or protected areas, while those of Stoev (2004c), Bachvarova & Stoev (2008), Bachvarova (2011), Bachvarova *et al.* (2015) and Vagalinski *et al.* (in press) deal with the centipede and millipede faunas of major Bulgarian cities and their suburbs.

Until now, the centipedes and millipedes of Western Stara Planina Mts have not been in the scope of any specialized study. Scattered data can be found in the following publications: Beron (1972, 1994, 2015), Beron & Guéorguiev (1967), Botoşăneanu *et al.* (1964), Ćurčić *et al.* (2000), Golemansky (1973), Golemansky & Taschev (1973), Guéorguiev & Beron (1962), Gulička (1967), Lang (1958), Makarov *et al.* (2003), Stoev (2004b), Stoev & Enghoff (2003), Strasser (1962a, b, 1966, 1969, 1973), Tabacaru (1967), Vagalinski *et al.* (2015), Verhoeff (1926a, b, c, d, 1928, 1937).

The classes Pauropoda and Symphyla are completely unstudied in the Vrachanski Balkan Nature Park.

Material and methods

The examined material is deposited in the Myriapoda collection of the National Museum of Natural History, Sofia (NMNHS) and the Institute of Biodiversity and Ecosystem Research (IBER), at the Bulgarian Academy of Sciences. The species checklist combines

data extracted from all available literature sources concerning the myriapods of Vrachanski Balkan Nature Park, with new data added from recent collecting in the studied area. Data on centipedes occurring in the nature park can be obtained from the catalogue of the Bulgarian Chilopoda (Stoev 2002). Likewise, the catalogue of Vagalinski & Stoev (2007) of the millipede order Julida is cited for all records referring to julidan diplopods from the area published prior to 2007.

Results

Table 1 presents a list of all myriapod species hitherto registered on the territory of the park. It is based on previously published information and original data from recently collected material. Here we present a species account of all new records.

CHILOPODA

***Eupolybothrus* (*Mesobothrus*) *transsylvanicus* (Latzel, 1882)**

Material (NMNHS)**:** Lakatnik Railway Station: Petrenski Dol Gorge, near Razhishkata Peshtera Cave; Studenata Peshtera Cave near Cherepish; near Parshevitsa Hut.

Note. This is a fairly common species in the studied area.

***Lithobius* (*Lithobius*) aff. *illyricus* Latzel, 1880**

Material from the studied area (NMNHS)**:** 1 ad. ♀, Ledenika Cave, 22.05.1994, P. Stoev leg.; 3 ad. ♀♀, 2 ad. ♂♂, same locality, 18.03.1995, P. Stoev & T. Ivanova leg.; 1 ad. ♀, labeled: "*L. borisi*, K. Verhoeff det." and "*L. erythrocephalus*, G. Ribarov det.", Cherepish Monastery, Propastta Pot hole, 04.12.1924, leg?; 1 juvenile specimen labeled "*Lithobius* sp. (agenitalis), K. Verhoeff det." same locality and date; 1 ad. m., Labirinta Cave, 07.11.1993, P. Stoev leg.; 1 ad. ♀, Serapionovata Peshtera Cave, 06.07.1960, P. Beron leg.; 2 ad. ♀♀, 2 juv., same locality, 03.02.1996, B. Petrov & B. Barov leg.; 2 ad. ♂♂, 1 ad. ♀, Botunya, Toshova Doupka Cave, 12.06.1974, P. Beron leg.; 1 ♀, same locality, 12.06.1994, T. Ivanova leg.

Other material from adjacent areas (NMNHS)**: Mezdra District** 2 ad. ♀♀, 1 ad. ♂ labeled "*Lithobius* sp.? Verhoeff det.", Karlukovo, Kasapnitsite Cave, 09.09.1923, I. Buresh leg.; 1 juvenile specimen, Haidushka Doupka Cave, 09.10.1932, Papazov & Atanasov leg.; 1 ad. fem. without last pair of legs, Bankovitsa Cave, 04.07.1950, P. Tranteev leg.; 1 very damaged ad. ♂, labeled *Lithobius* sp., Z. Matic det., Dalbokata Propast Pot hole, 17.06.1962, C. Delchev leg.; 1 ♂, 1 ♀, Kutsozliyata Cave, 06.03.1983, T. Ivanova leg.; 1 ad. ♂, Bezimenna 22 Cave, 14.05.1995, P. Mitov leg.; 1 ad. ♂, 1 ad. ♀, Kunino, Temnata Doupka Cave, 03.04.1964, D. Diudiviev? leg.; 1 juvenile specimen, Shipochinata Cave (N 1186) 26.11.1994, P. Stoev & T. Ivanova leg.; numerous specimens of both sexes, Chelovechi Dol County, Chelovecha Doupka Cave, 18.03.1995, P. Stoev & T. Ivanova leg.; 1 subad. ♀, Cave Nr. 294 between Kunino and Karlukovo, 04.10.1992, P. Stoev leg.; **Pleven District** 1 ad. ♀ with abnormal prosternum, labeled *L. erythrocephalus*, G. Ribarov det., Deventsi, Haidushkata Doupka Cave, 24.08.1927, Chr. Matrow leg.; 1 ad. ♀, same locality, 10.10.1979, P. Beron & St. Andreev leg.; **Sofia District** (Ponor Mts) 4 ad. ♂♂, 5 ad. ♀♀, Tserovo, Vodnata Peshtera Cave, rotten log, clay, 24.07.1997, B. Petrov & L. Prekrutov leg.; (Vrachanska Planina Mts) 1 ad. ♂, 1 ad. ♀, Lakatnik, Temnata Doupka Cave, 03.10.1926, I.

Buresh leg. (*L. erythrocephalus*, G. Ribarov det.); 1 ad. ♀, same locality, 13.06.1939, Pittioni leg.; 1 ad. ♀, 1 subad. ♂, Gornata (Arzhishkata; Rzhishkata) Peshtera Cave, 23.03.1930, P. Drensky leg. (*L. erythrocephalus*, G. Ribarov det.); 1 adult, very damaged and dried specimen, same locality, 08.07.1948, P. Drensky leg. and labeled "*L. lakatnicensis*".

Remarks. This species belongs to a highly polymorphic group of sibling species, commonly known as *L. erythrocephalus* group. Until now, its identity is uncertain, because of the large number of either unreliably described or weakly diagnosed taxa from the whole territory of Europe. In our opinion, the examined specimens belong to either *L. illyricus* Latzel, 1880, or a new, still undescribed species, morphologically close to the latter. *L. illyricus* occurs in caves in the Western Balkans. Other unsatisfactory known taxa of that group are: *L. slovenicus* Matic, 1979 (Slovenia), *L. erythrocephalus montanus* Attems, 1929 (Kosovo), *L. borisi* Verhoeff, 1928 (redescribed by Eason (1983) as subspecies *L. erythrocephalus borisi*), *L. electron* Verhoeff, 1928 and *L. glaciei* Verhoeff, 1928 (all from Bulgaria). Matic's (1973) record of *L. erythrocephalus* from Padezh Pot hole, near Breze probably belongs here too.

***Lithobius* (*Lithobius*) *lakatnicensis* Verhoeff, 1926**

Material (NMNHS)**:** Milanovo, Semova Yama Cave.

Note. This is the only troglobitic *Lithobius* in the area. The species is fairly common in the caves of West Bulgaria (see Stoev 2002 for full account of its distribution).

***Lithobius* (*Lithobius*) *muticus* C. L. Koch, 1847**

Material (NMNHS)**:** Toshina Mogila Peak; near Okolchitsa Hut, under stones, 9-11.08.1995, P. Stoev leg.; Vratsa; a locality between Yavorets and Buk peaks; Vrazhite Dupki Country near Lakatnik Railway Station.

Note. The species is fairly common in Bulgaria but was hitherto unknown in the area.

***Lithobius* (*Lithobius*) *viriatus* Sselivanoff, 1878**

Material (NMNHS)**:** Deserted mine gallery near Gorna Bela Rechka; between Yavorets and Buk peaks.

Note. It is one of the common species in Bulgaria (Stoev 2002).

***Cryptops anomalans* Newport, 1844**

Material (NMNHS)**:** Okolchitsa Hut.

***Clinopodes flavidus* C. L. Koch, 1847**

Material (NMNHS)**:** between Yavorets and Buk peaks.

DIPLOPODA

***Glomeris pustulata* Latreille, 1804**

Material (IBER)**:** 1 ♂, 2 ♀♀, by Zhitolyub Karstic Spring near Lakatnik Railway Station, under stones, 14.IV.2014, BV leg.

Note. This species is common in limestone terrains across Europe; frequently reported from Stara Planina Mts (Kime & Enghoff 2011).

***Polydesmus renschi* Schubart, 1934**

Material (IBER)**:** Ledenika Cave near Gorna Bela Rechka (NMNHS); 1 ♂ (IBER), by Zhitolyub Karstic spring near Lakatnik Railway Station, under stone, 14.IV.2014, BV leg.

Note. These are the first records of *P. renschi* from Vrachanski Balkan Nature Park. Nevertheless, the species is known from several localities in close proximity to the area (Strasser 1969).

***Brachydesmus dadayi* Verhoeff, 1895**

Material(IBER) **:** 2 ♂♂, 2 ♀♀, 2 juv. (IBER), Lakatnik Railway Station, the path to Razhishkata Cave, slope with scatterd trees and bushes on the N side of the massif, under stones and in leaf litter, 22.V.2016, BV & P. Mitov leg.

Note. The species is new to the studied area. However, in Bulgaria it is known with several records from Western Stara Planina and Predbalkan mountains. Gulička (1967) described the subspecies *brusenicus* from the vicinity of Brusen Village, near the town of Mezdra. Although our specimens agree on the diagnostic characters and drawings given by the author, we prefer to follow the view expressed by Strasser (1973), and refrain from using the subspecific category due to insufficient data on the geographic and individual variations within *B. dadayi*.

***Brachydesmus radewi* Verhoeff, 1926**

Material (NMNHS)**:** 1 ♂, Bulgaria, Cherepish, Ezeroto Cave, 3.II.2008, Yani Makulev & Zh. Zhechev leg.

Note. This species is new to the studied area, although it was already reported from the adjacently situated Chelovecha Dupka Cave near Kunino Railway Station (Stoev 2004b).

***Bulgarosoma bureschi* Verhoeff, 1926**

Material (NMNHS)**:** 1 ♂, 2 ♀♀, 1 juv., Vratsa District, v. Chelopek, Varteshkata Pot Hole, 1185 m, 04.IX.2004, P. Beron leg.

***Craspedosoma transsylvanicum* Verhoeff, 1897**

Material (IBER)**:** 1 ♂, 2 ♀♀, near Lakatnik Railway Station, young broadleaved forest, stony floor with thin leaf litter, 29.VI.2011, BV leg.

Note. The species is new to the studied area.

***Callipodella fasciata* (Latzel, 1883)**

Material (IBER)**:** 1 ♂, 2 ♀♀, near Lakatnik Railway Station, young broadleaved forest, stony floor with thin leaf litter, 5.V.2010, BV leg.

Note. The species is new to the studied area.

***Megaphyllum transsylvanicum* (Verhoeff, 1897)**

Material (IBER)**:** 1 ♂, near Lakatnik Railway Station, the path to Razhishkata Cave, slope with scattered trees and shrubs on the N side of the massif, under stones and in leaf litter, 23.III.2012, BV leg.

Table 1. List of the myriapods of Vrachanski Balkan Nature Park. The chorotypes largely follow those in Stoev (2007).

Taxon	References	Chorotype
MYRIAPODA (38)		
CHILOPODA (19)		
Order Lithobiomorpha (10)		
Family Lithobiidae (10)		
1. Eupolybothrus transsylvanicus (Latzel, 1882)	Stoev (2002), new data	CPBK
2. Eupolybothrus tridentinus (Fanzago, 1874)	Stoev (2002)	EEU
3. Lithobius (*Lithobius*) *agilis* C. L. Koch, 1847	Stoev (2002)	CEU
4. Lithobius (*L.*) aff. *illyricus* Latzel, 1880	Matic (1973) [as *L. erythrocephalus*], Stoev & Ribarov (1995) [as *L. erythrocephalus borisi* and *L. e.* subsp.?], new data	BK
5. Lithobius (*L.*) *lakatnicensis* Verhoeff, 1926	Stoev (2002), new data	BK
6. Lithobius (*L.*) *muticus* C. L. Koch, 1847	new data	CEU
7. Lithobius (*L.*) *viriatus* Sselivanoff, 1878	Stoev (2002), new data	EME
8. Lithobius (*Monotarsobius*) *crassipes* L. Koch, 1862	Stoev (2002)	ESI
9. Lithobius (*Sigibius*) *micropodus* (Matic, 1980)	Stoev (2002)	MED
10. Harpolithobius anodus (Latzel, 1880)	Stoev (2002)	EEU
Order Scolopendromorpha (3)		
Family Cryptopidae (3)		
1. Cryptops anomalans Newport, 1844	Stoev (2002), new data	EU
2. Cryptops croaticus Verhoeff, 1931	Stoev (2002)	EEU
3. Cryptops hortensis (Donovan, 1810)	Stoev (2002)	EMT
Order Geophilomorpha (6)		
Family Geophilidae (2)		
1. Geophilus flavus (De Geer, 1778)	Stoev (2002)	ESI
2. Clinopodes flavidus C.L. Koch, 1847	Stoev (2002), new data	EMT
Family Dignathodontidae (1)		
1. Henia (*Henia*) *illyrica* (Meinert, 1870)	Stoev (2002)	EEU
Family Linotaeniidae (3)		
1. Strigamia acuminata (Leach, 1815)	Stoev (2002)	EU
2. Strigamia crassipes (C. L. Koch, 1835)	Stoev (2002)	EU
3. Strigamia transsilvanica (Verhoeff, 1928)	Stoev (2002)	CPBK
DIPLOPODA (19)		
Order Glomerida (3)		
Family Glomeridae (2)		
1. Glomeris pustulata Latreille, 1804	Strasser (1966, 1969), new data	CEU

2. *Glomeris hexasticha* Brandt, 1833	Strasser (1969)	CEU
Family Doderiidae (1)		
1. *Trachysphaera orghidani* (Tabacaru, 1958)	Strasser (1962b, 1966, 1969, 1973)	CPBK
Order Polydesmida (4)		
Family Polydesmidae (3)		
1. *Polydesmus renschi* Schubart, 1934	new data	CPBK
2. *Brachydesmus dadayi* Verhoeff, 1895	new data	CPBK
3. *Brachydesmus radewi* Verhoeff, 1926	new data	BG
Family Paradoxosomatidae (1)		
1. *Strongylosoma stigmatosum* (Eichwald, 1830)	Strasser (1966), Stoev (2004b)	EEU
Order Chordeumatida (2)		
Family Anthroleucosomatidae (1)		
1. *Bulgarosoma bureschi* Verhoeff, 1926	Verhoeff (1926a & d) Botoşăneanu *et al.* (1964), Strasser (1966, 1973), new data	VR
Family Craspedosomatidae (1)		
1. *Craspedosoma transsylvanicum* Verhoeff, 1897	new data	EEU
Order Callipodida (2)		
Family Schizopetalidae (2)		
1. *Balkanopetalum armatum* Verhoeff, 1926	Verhoeff (1926c), Strasser (1966, 1969), Stoev & Enghoff (2003)	BG
2. *Calipodella fasciata* (Latzel, 1882)	new data	BK
Order Julida (8)		
Family Julidae (8)		
1. *Cylindroiulus boleti* (C.L. Koch, 1847)	Vagalinski & Stoev (2007)	EEU
2. *Typhloiulus bureschi* Verhoeff, 1926	Vagalinski & Stoev (2007), Vagalinski *et al.* (2015)	BG
3. *Typhloiulus longipes* Strasser, 1973	Vagalinski & Stoev (2007)	VR
4. *Xestoiulus fontisherculis* (Verhoeff, 1899)	Vagalinski & Stoev (2007)	CPBK
5. *Balkanophoenix borisi* Verhoeff, 1937	Vagalinski & Stoev (2007)	BG
6. *Megaphyllum transsylvanicum* (Verhoeff, 1897)	Vagalinski & Stoev (2007), new data	EEU
7. *Pachyiulus cattarensis* (Latzel, 1884)	Vagalinski & Stoev (2007)	BK
8. *Pachyiulus hungaricus* (Karsch, 1881)	Vagalinski & Stoev (2007)	CPBK

Concluding remarks

Up to now, the list of the myriapods of Vrachanski Balkan Nature Park comprises 38 species (Table 1). This accounts for approximately 15% of the total of 251 (sub)species recorded for Bulgaria (after Bachvarova *et al.* (2017). In the park, class Diplopoda is represented with 19 species from 5 orders and 8 families, and Chilopoda with 19 species belonging to 3 orders and 5 families. Although there are hitherto no records of the centipede order Scutigeromorpha (represented by a single species in Bulgaria – *Scutigera coleoptrata*), its presence in the park is likely to be documented in the future. The same probably refers to the millipede orders Polyxenida and Polyzoniida, as well as to the families Schendylidae and Henicopidae (Chilopoda), and Chordeumatidae, Blaniulidae and Nemasomatidae (Diplopoda). Future discoveries of ubiquitous species, like *Polydesmus complanatus*, *Leptoiulus trilineatus*, *Megaphyllum unilineatum*, and *Lithobius forficatus*, seem to be only a matter of more extensive sampling.

Most of the records from the studied area originate from several localities, namely: the vicinities of Lakatnik Railway Station and Cherepish Monastery, the town of Vratsa, and Ledenika Cave. This indicates that the park remains only marginally studied, especially as regards its summit parts. Only the cave myriapods can be considered well-studied, although interesting discoveries are probably yet to come in case of further biospeleological explorations.

As regards their zoogeographical affinities, the myriapods with a broader distribution within the Palaearctic prevail in the park: two species have Eurosiberian, three – European, four – Centraleuropean, eight – Easteuropean, two – Euro-Mediterrano-Turanian, one – Mediterranean, and one – Eastmediterranean distribution. A regional distribution – Carpathian-Balkan or Balkan – is shown by six and three species, respectively. Four species – *Brachydesmus radewi*, *Balkanopetalum armatum*, *Typhloiulus bureschi*, and *Balkanophoenix borisi* – are supposed Bulgarian endemics. The local endemics are represented by *Bulgarosoma bureschi* and *Typhloiulus longipes*.

In spite of its relatively small territory, Vrachanski Balkan Nature Park is of high conservational importance for the Bulgarian myriapod fauna. This is mostly due to the fact that the mountain is one of the richest in caves and cave fauna areas in the country (along with Ponor Mountain and Karlukovo Karst regions). Being a group prone to troglobiism, myriapods (especially millipedes) are well-known for their great diversity of narrow endemic species associated with particular karst massifs. Indeed, the two local endemics occurring in the park – *Typhloiulus longipes* and *Bulgarosoma bureschi* – are troglobionts known from several caves in Vrachanski Karst Reserve and Vezhdata Protected Area. Of the four Bulgarian endemics recorded in the mountain, *Typhloiulus bureschi* is a troglobiont, *Brachydesmus radewi* and *Balkanopetalum armatum* are troglophiles, and *Balkanophoenix borisi* is a supposed troglo- or/and petrophile.

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Многоножките (Myriapoda) на Природен парк Врачански Балкан

Павел Стоев, Боян Вагалински

(Резюме)

Представената статия обобщава фаунистичните данни за надклас Myriapoda на територията на Природен парк "Врачански Балкан". Анализът обхваща литературни източници и оригинални непубликуван данни. Установени са общо 38 вида мириаподи, съставляващи около 15% от видовото богатство на групата в България. Клас Chilopoda е представен от 19 вида, принадлежащи към 3 разреда и 5 семейства, а Diplopoda – от 19 вида, 5 разреда и 8 семейства. Липсват данни за видовия състав на два класа – Pauropoda и Symphyla – които като цяло са слабо проучени в страната. Шест вида се съобщават като нови за територията на парка. Направена е кратка зоогеографска характеристика на установения видов състав.

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Faunistic diversity of Vrachanski Balkan Nature Park. Part 2
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Some new data on dragonflies (Odonata) of Vrachanska Planina Mountains

Dimitar Bechev

Abstract. Records of three more species are added to the fauna of Vrachanska Planina Mts.: *Calopteryx splendens*, *Lestes dryas* and *Libellula depressa*. A list of all known species for this mountains is provided.

Key words: Odonata, Western Stara Planina Mts., Bulgaria.

Introduction

Till now, 8 species of dragonflies are reported for Vrachanska Planina Mts. (Pavlova & Bechev 2016). Here three more species are added to the list as new records to the area: *Calopteryx splendens*, *Lestes dryas* and *Libellula depressa*.

Material and Methods

All the presented records of dragonflies are on the base of author`s photographs and identifications.

Faunistic List

New records

***Calopteryx splendens* (Harris, 1782)**

Dolno Ozirovo Village, near Botunya River, 43.2484 N/ 23.3471 E, 260 m a.s.l., 24.07.2016, 2 males; Lyutadzik Village, near Cherna River, 43.1977 N/ 23.4107 E, 378 m a.s.l., 24.07.2016, 1 male and 1 female in copula.

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

Dolno Ozirovo Village, near Botunya River, 43.2484 N/ 23.3471 E, 260 m a.s.l., 24.07.2016, male specimens; Lyutadzik Village, near Cherna River, 43.1977 N/ 23.4107 E, 378 m a.s.l., 24.07.2016, male and female specimens.

***Lestes dryas* Kirby, 1890**

Small lake in Parshevitsa Hut region, 43.1395 N/ 23.4656 E, 1370 m a.s.l., 23.07.2016, 1 male.

***Libellula depressa* (Linnaeus, 1758)**

Small lake in Parshevitsa Hut region, 43.1395 N/ 23.4656 E, 1370 m a.s.l., 23.07.2016, 1 male.

The previous report of *Somatochlora metallica* (Vander Linden, 1825) in Pavlova & Bechev (2016) need to be omitted, because the locality is out of Vrachanska Planina Mts.

From all 71 species known from Bulgaria (Gainzarain 2017), for this mountains only 10 species are recorded. They species are listed below (the conservation importance is in square brackets).

Species List

ZYGOPTERA

Calopterygidae

Calopteryx splendens (Harris, 1782)
Calopteryx virgo (Linnaeus, 1758)

Lestidae

Lestes dryas Kirby, 1890 [IUSN (LC)]
Lestes sponsa (Hansemann, 1823)
Sympecma fusca (Vander Linden, 1820) [CORINE]

Platycnemididae

Platycnemis pennipes (Pallas, 1771)

ANISOPTERA

Aeschnidae

Aeshna mixta Latreille, 1805

Gomphidae

Onychogomphus forcipatus (Linnaeus, 1758) [IUSN (VU), CORINE]

Libellulidae

Libellula depressa (Linnaeus, 1758)
Sympetrum sanguineum (Muller, 1764)

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Някои нови данни за водните кончета (Odonata) на Врачанска планина

Димитър Бечев

(Резюме)

Дадени са нови данни за 4 вида, от които *Calopteryx splendens*, *Lestes dryas* и *Libellula depressa* са нови за Врачанска планина. С това списъкат на известните за планината водни кончета включва 10 вида, от общо 71 установени в България. *Sympecma fusca*, *Lestes dryas* и *Onychogomphus forcipatus* са с консервационна значимост.

Bechev, D. & Georgiev, D. (Eds.),
Faunistic diversity of Vrachanski Balkan Nature Park. Part 2
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A case study on the Barkfly fauna of Vrachanski Balkan Nature Park (Insecta: Psocoptera)

DILIAN GEORGIEV

Abstract. The study was carried out only during two days of terrain work, 18 and 19.09.2017. A total of 11 species were found (and one unidentified nymph of *Liposcelis* species). All of them were new records to this mountain region. One species was a new record for Bulgaria: *Prionoglaris* cf. *stygia*. Summing the later and six other (*Valenzuela flavidus*, *Bertkauia lucifuga*, *Lachesilla pedicularia*, *Liposcelis silvarum*, *Oreopsocus montanus*, *Graphopsocus cruciatus*), seven species were newly recorded for Stara Planina Mts.

Key words: Psocoptera, distribution, Bulgaria.

Material and Methods

This study was carried out only during two days of terrain work, 18 and 19.09.2017. All materials were collected and identified by the author. The barkflies were searched by following techniques: 1. hand collecting; 2. sieving with 1 mm mesh width sieve of crushed tree bark particles above white cloth; 3. beating the vegetation above a sieve; 4. sweep netting of vegetation. Specimens were over narcotized by diethyl ether, stored in ethanol or glycerin, and after processing deposited in the collection of the author. Species identifications followed Lienhard (1998) and Saville (2008).

Results

A total of 11 species were found during a two-day survey. All of them were new records to this mountain region.

Caeciliusidae Mockford, 2000

Caecilius fuscopterus (Latreille, 1799)

Material examined: Near village of Gorna Bela Rechka, river bank forest, brunches of *Crataegus* sp. and *Salix caprea*, N43 10 36.5 E23 21 52.3, 475 m a.s.l., 18.09.2017, 2 ♀, 1 ♂, coll. by sweep netting.

Known localities in Bulgaria: The species was just recently reported from one locality near Chiflika village in Stara Planina Mts. by Georgiev & Todorov (2017).

Valenzuela flavidus (Stephens, 1836)

Material examined: Near the road to Razhishka Mahala village area, xeric bush area near road, brunches of *Acer campestre*, N43 06 31.9 E23 23 25.4, 739 m a.s.l., 18.09.2017, 1 ♀, coll. by beating the vegetation.

Known localities in Bulgaria: Firstly reported by Giese (1964) without an exact locality. Sziráki (2013) published two localities in Rila Mts. (near Dushevitsa River and Tiha Rila), and one in Vitosha Mts. (near Dragalevska River). First record for Stara Planina Mts.

Elipsocidae Pearman, 1936

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

Material examined: Near the road to Razhishka Mahala village area, *Pinus sylvestris* forest, brunches of *Pinus sylvestris*, N43 06 34.9 E23 23 24.7, 757 m a.s.l., 18.09.2017, 1 ♀, 1 ♂, coll. by sweep netting.

Known localities in Bulgaria: The species was recently reported from two localities in the country – near Kolena village in Sarnena Gora Mts. (Georgiev 2017a), and near Chiflika village in Stara Planina Mts. (Georgiev & Todorov 2017).

***Elipsocus moebiusi* Tetens, 1891**

Material examined: Near the road to Razhishka Mahala village area, river bank forest near a stream and a meadow, brunch of *Prunus cerasifera* overgrown by lichens, N43 06 36.8 E23 23 25.1, 737 m a.s.l., 18.09.2017, 1 ♂, coll. by beating the vegetation.

Known localities in Bulgaria: The species was recently reported from Stara Planina Mts. below Shipka Peak (Georgiev 2017a).

Epipsocidae Pearman, 1936

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

Material examined: Near Razhishka Mahala village area, xeric patchy *Quercus* sp. forest, under stone, N43 05 44.8 E23 23 29.5, 780 m a.s.l., 19.09.2017, 1 ♀, coll. by hand and brush.

Known localities in Bulgaria: Firstly reported by Giese (1964) without an exact locality. Georgiev (2017b) found this species near Pelevun village in East Rhodopes. First record for Stara Planina Mts.

Lachesillidae Pearman, 1936

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

Material examined: Material examined: Near village of Gorna Bela Rechka, river bank forest, brunches of *Crataegus* sp., N43 10 36.5 E23 21 52.3, 475 m a.s.l., 18.09.2017, 1 ♂, coll. by sweep netting.

Known localities in Bulgaria: Reported only from three park areas in Sofia City by Drensky (1953). First record for Stara Planina Mts.

Liposcelididae Broadhead, 1950

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

Material examined: Near the road to Razhishka Mahala village area, river bank forest near a stream and a meadow, in a dry bark of living *Prunus cerasifera*, N43 06 36.8 E23 23 25.1, 737 m a.s.l., 18.09.2017, 1 ♀, coll. by sieving.

Known localities in Bulgaria: Known only from one locality – Knyazhevo area in

Sofia City, foothills of Vitosha Mts. (Drensky 1953). First record for Stara Planina Mts.

***Liposcelis* sp.**

One unidentified nymph from the group *sylvarum/pearmani/decolor* was collected from ants nest (cf. *Formica* sp.), near Razhishka Mahala village area, in a xeric oak forest, N43 05 44.8 E23 23 29.5, 780 m a.s.l. on 19.09.2017. Further research is needed to clear the species identity of these *Liposcelis* specimens inhabiting the area.

Peripsocidae Roesler, 1944

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

Material examined: Near village of Gorna Bela Rechka, river bank forest, brunches of *Crataegus* sp. and *Salix caprea*, N43 10 36.5 E23 21 52.3, 475 m a.s.l., 18.09.2017, 3 ♀, 1 ♀ nymph, coll. by sweep netting.

Known localities in Bulgaria: Reported from East Stara Planina Mts., near Medven village by Sziráki (2013).

Prionoglarididae Badonnel, 1951

***Prionoglaris* sp. (cf. *stygia* Enderlein, 1909)**

Material examined: Petrenski Dol Gorge, Svinskata Dupka Cave, from the wall near the entrance, N43 05 17.7 E23 22 18.1, 470 m a.s.l., 5 nymphs, coll. by hand and brush.

Known localities in Bulgaria: Newly recorded genus and family for Bulgaria. The author found nymphs of *Prionoglaris* sp. in some more caves in East Rhodopes and Central Stara Planina Mts., which is a matter of future publications.

Psocidae Hagen, 1865

***Oreopsocus montanus* (Kolbe, 1884)**

Material examined: Near the road to Razhishka Mahala village area, *Pinus sylvestris* forest, brunches of *Pinus sylvestris*, N43 06 34.9 E23 23 24.7, 757 m a.s.l., 18.09.2017, 1 ♂, coll. by sweep netting.

Known localities in Bulgaria: Reported by Giese (1964) without an exact locality. First exact locality of this species in the country and new record for Stara Planina Mts.

Stenopsocidae Pearman, 1936

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

Material examined: Near the road to Razhishka Mahala village area, xeric bush area near road, brunches of *Quercus* sp., N43 06 30.0 E23 23 26.6, 720 m a.s.l., 18.09.2017, 1 ♀, coll. by beating the vegetation; Near village of Gorna Bela Rechka, river bank forest, brunches of *Crataegus* sp., N43 10 36.5 E23 21 52.3, 475 m a.s.l., 18.09.2017, 1 ♂, coll. by sweep netting; Near Razhishka Mahala village area, xeric patchy *Quercus* sp. forest, brunches of *Acer campestre*, N43 05

44.8 E23 23 29.5 , 780 m a.s.l., 19.09.2017,1 ♀, coll. by sweep netting.

Known localities in Bulgaria: Reported only for the area of Borovets Resort at Rila Mts. by Drensky (1953). First record for Stara Planina Mts.

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Кратко проучване върху видовия състав на сеноядите в Природен парк Врачански Балкан (Insecta: Psocoptera)

Дилян Георгиев

(Резюме)

До сега липсваха данни за сеноядите от този район на България. По време на двудневното си посещение на Врачански Балкан (18 и 19.09.2017) успях да събера 11 вида в южната част на планинския масив. Находището на пещеролюбивия *Prionoglaris* cf. *stygia* (събрани само нимфи) е първо за страната. Заедно с него и още шест вида (*Valenzuela flavidus*, *Bertkauia lucifuga*, *Lachesilla pedicularia*, *Liposcelis silvarum*, *Oreopsocus montanus*, *Graphopsocus cruciatus*), се съобщават за пръв път за фауната на Стара планина.

Bechev, D. & Georgiev, D. (Eds.),
Faunistic diversity of Vrachanski Balkan Nature Park. Part 2
ZooNotes, Supplement 7, Plovdiv University Press,
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Ground beetles (Coleoptera: Carabidae) from the region of Vrachanska Planina Mountains.

Teodora Teofilova

Abstract. The present study compiles a list of Carabidae species from the Vrachanska Planina Mts. and "Vrachanski Balkan" Natural Park. The species list is completed on the basis of the available bibliographic data. A total of 125 species are found, including 24 endemic species and subspecies, one relict and some rare and stenotopic species. They belong to 46 genera and 23 tribes. This represents, respectively, 17% of all established for the Bulgarian carabid fauna species and 37% of the genera. The richest tribes are Harpalini (32 species), Pterostichini (19 species), Amarini (12 species) and Carabini (12 species). Zoogeographical analysis shows that the Northern Holarctic and Euro-Siberian faunal type prevailed. In relation to their life forms, zoophagous carabids predominate, presented by 80 species (64%). Mixophyitophagous are 45 species (36%). Most of the ground beetles are mesophilous (44 species, 35%) and mesoxerophilous (42 species, 34%).

Key words: carabids, Vrachanski Balkan, endemism, check list

Introduction

From the beginning of the 20th century until now, 43 authors have published 46 studies concerning the carabid fauna of the whole region of the Western Stara Planina Mts. So far 195 species (26% of all Bulgarian Carabidae species) are known and another 56 are likely to be found there (Guéorguiev & Teofilova *in prep.*). Thirty-two of these sources contain data about the ground beetles of Vrachanska Planina Mts. (Vrachanski Balkan).

The Vrachanska Planina Mts. is situated between the Fore-Balkan and the main Balkan Ridge. Within its territory there are several protected areas with different designation – "Vrachanski Balkan" Natural Park, "Vrachanski Karst" Nature Reserve, four protected sites and five natural monuments. Vrachanska Planina Mts. overlaps with the SPA "Vrachanski Balkan" BG0002053, included in EU Directive 79/409, and the SAC "Vrachanski Balkan" BG0000166 of Directive 92/43. In 1998 "Vrachanski Karst" Reserve is determined as a CORINE site with code F00000300, due to its European significance in protection of rare and endangered habitats, plants and animals. In 2005 BirdLife International pronounced the territory as Important Bird Area with code BG 053.

On the territory of the adjoining Natural Park a variety of habitats occur: oak forests, beech forests, coniferous plantations, broadleaf plantations, bushes, riparian woods and bushes, dry grasslands, mountain pastures, mesophilous and hygrophilous grasslands, rocky habitats, inland standing and running surface waters, as well as some artificial landscapes – villages, chalets, huts, etc. This fact is a prerequisite for the occurrence of species from different faunistic complexes, which are more or less attached to a particular setting of natural conditions. According to the latest survey of the carabid fauna on the

territory of the Natural Park (Guéorguiev 2011), there occur 96 species (13% of all Bulgarian species). Considering that the degree of research in the range of Vrachanski Balkan is around 55%, it can be argued that the expected real number of carabid species is about 180 (Guéorguiev 2011).

The aim of the present study is to compile a list of Carabidae species from the Vrachanska Planina Mts. and "Vrachanski Balkan" Natural Park, and to reveal some patterns of the species composition from zoogeographic, ecological and conservation point of view.

Material and Methods

A synopsis and a critical overview of the literature concerning the ground beetles of the studied territory are made. The species list is completed on the basis of the available bibliographic data. In addition, some old, but unpublished data are given with date and name of the collector(s) and the following abbreviations are used: coll. – collection; NMNH – National Museum of Natural History, Sofia; NMPC – National Museum (Natural History), Prague, Czech Republic; NP – Nature Park; pers. comm. – personal communication.

For some species are given records of localities, which are geographically not included in the real boundaries of the Vrachanska Planina, but are located in the immediate vicinity. Such are, for example, Cherepish, Cherepishki Monastery, Mezdra and Varshets. In many cases, records of a given locality include only the name of the nearest settlement, which can sometimes be misleading. For example, the notes from Varshets could be related to the Vrachanska Planina as far as Varshets is located on the border between it and the Ponor Mt. Ridge. The records from these settlements relate only to species with wider distribution, which are found in other areas, both neighbouring Vrachanska Planina and more distant.

According to their zoogeographical belonging the ground beetles are separated in zoogeographical categories and faunal types according to Vigna Taglianti *et al.* (1999) with some changes.

Categorization of the species in respect of their life forms follows the classification of Sharova (1981). The following codes are used: *Life form class 1. Zoophagous*. Life form subclass: 1.1 – Phytobios; 1.2 – Epigeobios; 1.3 – Stratobios;. 1.4 – Geobios. Life form groups: 1.1.2 - stem-dwelling hortobionts; 1.1.3 - leaf-dwelling dendrohortobionts; 1.2.2 – large walking epigeobionts; 1.2.2(1) – large walking dendroepigeobionts; 1.2.3 – running epigeobionts; 1.2.4 – flying epigeobionts; 1.3(1) – series crevice-dwelling stratobionts; 1.3(1).1 – surface & litter-dwelling; 1.3(1).2 – litter-dwelling; 1.3(1).3 – litter & crevice-dwelling; 1.3(1).5 - litter & bark-dwelling; 1.3(1).6 - bothrobionts; 1.3(1).7 - troglobionts; 1.3(2) – series digging stratobionts; 1.3(2).1 – litter & soil-dwelling; 1.3(2).2 - litter & crevice-dwelling; 1.3(2).4 - troglobionts; 1.4.2(1) – small digging geobionts. *Life form class 2. Mixophytophagous*. Life form subclass: 2.1 – Stratobios; 2.2 – Stratohortobios; 2.3 – Geohortobios. Life form groups: 2.1.1 – crevice-dwelling stratobionts; 2.2.1 – stratohortobionts; 2.3.1 – harpaloid geohortobionts; 2.3.1(1) - crevice-dwelling harpaloid geohortobionts; 2.3.2 – zabroid geohortobionts; 2.3.3 – dytomeoid geohortobionts. The first figure in the index shows the class of life form, the second – the subclass, the third – the life form group. In brackets after the subclass the series is shown, when it exists.

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

Results and Discussion

The review of the literary sources revealed that in Vrachanska Planina Mts. (including the closest localities of Cherepish, Mezdra and Varshets) 125 species of ground beetles occur. They belong to 46 genera and 23 tribes. This represents, respectively, 17% of all established for Bulgarian carabid fauna species and 37% of the genera (Guéorguiev & Teofilova *in prep.*).

The richest tribes are Harpalini (32 species), Pterostichini (19 species), Amarini (12 species) and Carabini (12 species). 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.

The most species rich genera are *Harpalus* (19 species), *Amara* (11 species), *Pterostichus* and *Carabus* (8 species each).

Species list

***Cicindela (Cicindela) campestris campestris* Linnaeus, 1758**

Lakatnik (Kantardzhieva 1928).

***Cicindela (Cicindela) hybrida* Linnaeus, 1758**

Cherepish (Nedelkov 1909, Rambousek 1912), Lakatnik (Rambousek 1912).

***Cicindela (Cicindela) transversalis transversalis* Dejean, 1822**

Cherepish, Lakatnik (Rambousek 1912).

***Leistus (Pogonophorus) spinibarbis rufipes* Chaudoir, 1843**

Lakatnik (Guéorguiev & Guéorguiev 1995b; 1 ex., 15.V.1926, R. Radev leg., coll. of NMNH).

***Notiophilus biguttatus* (Fabricius, 1779)**

Lakatnik (Guéorguiev & Guéorguiev 1995b; 1 ex., 15.V.1926, I. Buresh leg., coll. of NMNH).

***Calosoma (Calosoma) sycophanta sycophanta* (Linnaeus, 1758)**

Above Milanovo Vill., route Okolchitsa Peak – Chelopek Vill. (Atanasov *et al.* 2001); Vrachanski Balkan, Cherepishki Monastery (Buresch & Kantardzhieva 1928); NP "Vrachanski Balkan" (Guéorguiev 2011); Lakatnik (1♂, 30.VII.1986, T. Shtirkov leg., private coll.).

***Calosoma (Calosoma) inquisitor inquisitor* (Linnaeus, 1758)**

Chernite Dupki Site W of Ledenika Hut (Atanasov *et al.* 2001); Cherepishki Monastery (Buresch & Kantardzhieva 1928).

***Carabus (Tachypus) cancellatus intermedius* Dejean, 1826**

Varshets (Rambousek 1912, Breuning 1928).

***Carabus (Carabus) granulatus granulatus* Linnaeus, 1758**

Varshets (Rambousek 1912, Breuning 1928, Buresch & Kantardzhieva 1928, Kryzhanovskij, unpublished data).

***Carabus (Trachycarabus) scabriusculus bulgarus* Lapouge, 1908**

Vrachanski Balkan, Mezdra (Buresch & Kantardzhieva 1928); "Sokolets" (1♂, 14.VII.1933, N. Atanasov & D. Papazov leg., coll. of NMNH).

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

Ledenika Cave near Vratsa (Atanasov *et al.* 2001); Vratsa (Rambousek 1912);

Vrachanski Balkan (Buresch & Kantardzhieva 1928); NP "Vrachanski Balkan" (Guéorguiev 2011).

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

Cherepish (Rambousek 1912); Cherepishki Monastery (Buresch & Kantardzhieva 1928); NP "Vrachanski Balkan" (Guéorguiev 2011); Lakatnik (1 ex., 01.VII.1986, T. Shtirkov leg., private coll.).

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

Near Gorna Bela Rechka Vill., Lakatnik (Guéorguiev & Guéorguiev 1995b, Atanasov *et al.* 2001); NP "Vrachanski Balkan" (Guéorguiev 2011).

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

Opletnya Vill. (Atanasov *et al.* 2001); Razhishka Yama Cave (Guéorguiev & Beron 1962, Guéorguiev & Beron 1962, Beron 2016); Lakatnik (Breuning 1928, Kryzhanovskij, unpublished data); Gorna Bela Rechka Vill. (Buresch & Kantardzhieva 1928).

***Carabus (Procerus) gigas gigas* Creutzer, 1799**

Varshets (Rambousek 1912, Breuning 1928); NP "Vrachanski Balkan" (Guéorguiev 2011); Lakatnik (3 ex., 30.VI.1985, 6 ex., 20.VII.1985, T. Shtirkov leg., private coll.); near Svinskata Dupka Cave (V. Beshkov, pers. comm.).

? *Carabus (Hygrocarabus) variolosus* Fabricius, 1787

Varshets (Rambousek 1912, Hieke & Wrase 1988, Turin *et al.* 2003 Kryzhanovskij, unpublished data).

Notes: This species with high conservation value is included in the Directive 92/43/EEC (1992), Annexes II and III of the LBD (2002), and in the Red Data Book of Bulgaria (Golemanski *et al.* 2015) as "Critically Endangered". It is extremely rare and its presence in the studied region must be confirmed with additional purposive researches. As hygrophilous, paludicol, semiaquatic species (Koch 1989), generally associated with swamps and riverine forests, it is possible to be found in the surroundings of brooks and small ponds in the forests up to 1000 m a.s.l. (Turin *et al.* 2003).

***Cychrus semigranosus balcanicus* Hopffgarten, 1881**

Vratsa (Rambousek 1912); Vrachanski Balkan, Cherepishki Monastery (Buresch & Kantardzhieva 1928).

***Elaphrus (Neoelaphrus) uliginosus* Fabricius, 1792**

Cherepish (Rambousek 1912, Hieke & Wrase 1988).

***Trechus (Trechus) quadristriatus* (Schrank, 1781)**

Varshets (Rambousek 1912); Princhovitsa (Beron 1994, Beron 2015, Beron 2016).

***Trechus (Trechus) irenis* Csiki, 1912**

Varshets (Rambousek 1912).

***Tachyta (Tachyta) nana* (Gyllenhall, 1810)**

Varshets (Rambousek 1912).

***Pheggomisetes bureschi* (Knirsch, 1923)**

Caves: Barkite 8 (Dupré 2000, Beron 2015, Beron 2016); Chavkite (Guéorguiev 1964, Guéorguiev 1965, Beron 2015, Beron 2016); Golemata Mecha Dupka (Guéorguiev 1964, Guéorguiev 1965, Beron 2015, Beron 2016); Kalnata Dupka (Beron & Guéorguiev 1967, Beron 2015, Beron 2016); Ledenika (Knirsch 1923, Buresch 1924, Guéorguiev & Beron 1962, Guéorguiev 1964, Guéorguiev 1965, Hieke & Wrase 1988, Beron 2015, Beron 2016); Ledenishka Yama (Guéorguiev 1964, Guéorguiev

1965, Beron 2015, Beron 2016); Malata Yama (Guéorguiev 1964, Guéorguiev 1965, Beron 2016); Malkata Mecha Dupka (Guéorguiev 1964, Guéorguiev 1965, Beron 2015, Beron 2016); Malkata Nevestina Propast (Beron & Guéorguiev 1967, Beron 2015, Beron 2016); Medenik near Eliseyna (Knirsch 1924, Beron 2015, Beron 2016); Nevestina Propast (Guéorguiev 1964, Guéorguiev 1965, Beron 2016); Pesopin Kamak (Guéorguiev 1964, Guéorguiev 1965, Beron 2015, Beron 2016); Propastta (Guéorguiev 1964, Guéorguiev 1965, Beron 2016); Radyova Propast (Guéorguiev 1964, Guéorguiev 1965, Beron 2015, Beron 2016); Reznyovete (Guéorguiev 1964, Guéorguiev 1965, Hieke & Wrase 1988, Beron 2015, Beron 2016); Zmeyova Dupka (Guéorguiev 1964, Guéorguiev 1965, Beron 2015, Beron 2016); Zmeyova Dupka II (Beron & Guéorguiev 1967, Beron 2015, Beron 2016); Vratsa, Chelopek, Milanovo (Guéorguiev 1977); Milanovo (Hieke & Wrase 1988); caves near Vratsa, Eliseyna, Chelopek and Milanovo (Guéorguiev & Guéorguiev 1995b); NP "Vrachanski Balkan" (Guéorguiev 2011); caves Mizhishnitsa and Duglaska (Beron 2015, Beron 2016); Vrachanska Planina (Kryzhanovskij, unpublished data). **Troglobite**.

***Pheggomisetes globiceps* Buresch, 1925**

Caves near Vratsa (Hieke & Wrase 1988, Kryzhanovskij, unpublished data).

- *Pheggomisetes globiceps georgievi* Z. Karaman, 1958

Yamata Cave near Lakatnik (Karaman 1958, Guéorguiev & Beron 1962, Guéorguiev 1964, Guéorguiev 1965, Guéorguiev 1977, Guéorguiev & Guéorguiev 1995b, Guéorguiev *et al.* 1997, Beron 2015, Beron 2016); NP "Vrachanski Balkan" (Guéorguiev 2011). **Troglobite**.

- *Pheggomisetes globiceps lakatnicensis* Jeannel, 1928

Caves: Golemata Mecha Dupka (Guéorguiev 1964, Beron & Guéorguiev 1967, Beron 2015, Beron 2016); Kolkina Dupka (Guéorguiev 1964, Beron & Guéorguiev 1967, Beron 2016); Radyova Propast (Guéorguiev 1964, Beron & Guéorguiev 1967, Beron 2015, Beron 2016); Svinskata Dupka (Guéorguiev 1964, Beron & Guéorguiev 1967, Beron 2015, Beron 2016); Temnata Dupka near Lakatnik (Jeannel 1928, Guéorguiev & Beron 1962, Guéorguiev 1964, Beron 2015, Beron 2016); Zidanka (Guéorguiev 1964, Beron & Guéorguiev 1967, Beron 2015, Beron 2016); Vratsa, Lakatnik (Guéorguiev 1977); caves near Lakatnik, Milanovo and Vratsa (Guéorguiev & Guéorguiev 1995b); NP "Vrachanski Balkan" (Guéorguiev 2011). **Troglobite**.

- *Pheggomisetes globiceps mladenovi* V.B. Guéorguiev, 1964

Malkata Mecha Dupka Cave near Vratsa (Guéorguiev 1964, Guéorguiev 1977, Beron 2015, Beron 2016); Barkite 8 (Dupré 2000, Beron 2015, Beron 2016); caves near Vratsa (Guéorguiev & Guéorguiev 1995b); NP "Vrachanski Balkan" (Guéorguiev 2011). **Troglobite**.

- *Pheggomisetes globiceps stoicevi* V. B. Guéorguiev, 1964

Nevestina Propast Cave near Vratsa (Beron & Guéorguiev 1967, Guéorguiev 1965, Guéorguiev 1977, Guéorguiev & Guéorguiev 1995b, Beron 2015, Beron 2016); NP "Vrachanski Balkan" (Guéorguiev 2011). **Troglobte**.

***Pheggomisetes radevi* Knirsch, 1924**

- *Pheggomisetes radevi radevi* Knirsch, 1924

Ledenika Cave (Knirsch 1924, Guéorguiev & Beron 1962, Guéorguiev 1964, Guéorguiev 1965, Hieke & Wrase 1988, Guéorguiev & Guéorguiev 1995b, Guéorguiev et al. 1997, Beron 2015, Beron 2016, Kryzhanovskij, unpublished data); Vratsa

(Guéorguiev 1977); NP "Vrachanski Balkan" (Guéorguiev 2011). **Troglobite**.

- *Pheggomisetes radevi ilchevi* Knirsch, 1924

Medenik Cave near Eliseyna (Knirsch 1924, Guéorguiev & Beron 1962, Guéorguiev 1964, Guéorguiev 1977, Hieke & Wrase 1988, Guéorguiev & Guéorguiev 1995b, Guéorguiev *et al.* 1997, Beron 2015, Beron 2016, Kryzhanovskij, unpublished data); NP "Vrachanski Balkan" (Guéorguiev 2011). **Troglobite**.

- *Pheggomisetes radevi tranteevi* V. B. Guéorguiev, 1964

Suhata Yama Cave near Druzhevo Vill. (Guéorguiev 1964, Guéorguiev 1977, Hieke & Wrase 1988, Guéorguiev & Guéorguiev 1995b, Beron 2015, Beron 2016, Kryzhanovskij, unpublished data); NP "Vrachanski Balkan" (Guéorguiev 2011). **Troglobite**.

***Duvalius (Paraduvalius) beroni* V. B. Guéorguiev, 1971**

Toshova Dupka Cave near Glavatsi Vill. (Guéorguiev 1971, Guéorguiev 1977, Hieke & Wrase 1988, Guéorguiev & Guéorguiev 1995b, Guéorguiev *et al.* 1997, Guéorguiev 2004, Beron 2015, Beron 2016, Kryzhanovskij, unpublished data); NP "Vrachanski Balkan" (Guéorguiev 2011). **Troglobite**.

***Duvalius (Paraduvalius) papasoffi* (Mandl, 1942)**

Caves: Pyasachnata Dupka near Lakatnik (Guéorguiev 1965, Beron & Guéorguiev 1967, Guéorguiev 1971, Beron 2015, Beron 2016); Temnata Dupka near Lakatnik (Mandl 1942, Guéorguiev & Beron 1962, Guéorguiev 1965, Guéorguiev 1971, Beron 2015, Beron 2016); Zidanka near Lakatnik (Guéorguiev 1965, Beron & Guéorguiev 1967, Guéorguiev 1971, Guéorguiev 2004, Beron 2015, Beron 2016); caves near Lakatnik (Guéorguiev 1977, Hieke & Wrase 1988, Guéorguiev & Guéorguiev 1995b); NP "Vrachanski Balkan" (Guéorguiev 2011). **Troglobite**.

***Duvalius (Paraduvalius) zivkovi* (Knirsch, 1925)**

Ledenika Cave (Knirsch 1925, Guéorguiev 1965, Guéorguiev 1971, Hieke & Wrase 1988, Guéorguiev 2004, Beron 2015, Beron 2016, Kryzhanovskij, unpublished data); Malkata Mecha Dupka Cave (Beron & Guéorguiev 1967, Beron 2015, Beron 2016); precipice Malkata Nevestina Propast (Beron 2015, Beron & Guéorguiev 1967, Guéorguiev 1971, Hieke & Wrase 1988, Guéorguiev 2004, Beron 2016); Barkite 8 (Dupré 2000, Beron 2015, Beron 2016); a precipice near Vratsa (Guéorguiev 1965); a cave near Vratsa (Guéorguiev 1977); caves near Vratsa (Guéorguiev & Guéorguiev 1995b, Guéorguiev *et al.* 1997, Kryzhanovskij, unpublished data); NP "Vrachanski Balkan" (Guéorguiev 2011). **Troglobite**.

***Clivina (Clivina) collaris* (Herbst, 1784)**

Bohsnyashki Preslop, Okolchitsa Peak (Atanasov *et al.* 2001); NP "Vrachanski Balkan" (Guéorguiev 2011).

***Dyschirius (Dyschiriodes) aeneus aeneus* (Dejean, 1825)**

Lakatnik (Vasilev1992); NP "Vrachanski Balkan" (Guéorguiev 2011).

***Bembidion (Metallina) lampros* (Herbst, 1784)**

Bohsnyashki Preslop, Okolchitsa Peak (Atanasov *et al.* 2001).

***Bembidion (Metallina) properans* (Stephens, 1828)**

Bohsnyashki Preslop (Atanasov *et al.* 2001).

***Bembidion (Philochthus) guttula* (Fabricius, 1792)**

Lakatnik (Hieke & Wrase 1988, Guéorguiev & Guéorguiev 1995b).

***Bembidion (Bembidionetolitzkya) varicolor varicolor* (Fabricius, 1803)**

Varshets (Rambousek 1912, Hieke & Wrase 1988).

***Bembidion (Nepha) genei illigeri* Netolitzky, 1914**

Zmeyova Dupka Cave (Bonavita & Vigna Taglianti 2010).

***Bembidion (Peryphanes) deletum deletum* Audinet-Serville, 1821**

Bohsnyashki Preslop, route Okolchitsa Peak – Skaklya (Atanasov *et al.* 2001); NP "Vrachanski Balkan" (Guéorguiev 2011).

***Bembidion (Peryphanes) dalmatinum dalmatinum* Dejean, 1831**

Route Okolchitsa Peak – Skaklya, N Dolno Ozirovo Vill. (Atanasov *et al.* 2001); NP "Vrachanski Balkan" (Guéorguiev 2011); Vrachanska Planina (2 ex., 23.VI.1938, J. Hlisnikowski leg., coll. of NMPC).

***Patrobus atrorufus* (Strøm, 1768)**

Varshets (Rambousek 1912, Guéorguiev 1992, Guéorguiev & Guéorguiev 1995b).

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

Varshets (Rambousek 1912); Barkite Site, Chernite Dupki Site W of Ledenika Hut (Atanasov *et al.* 2001); NP "Vrachanski Balkan" (Guéorguiev 2011).

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

Reservoirs between Beglishka Mogila Peak and Parshevitsa Hut (Atanasov *et al.* 2001).

***Poecilus (Poecilus) lepidus lepidus* (Leske, 1785)**

Reservoirs between Beglishka mogila Peak and Parshevitsa Hut (Atanasov *et al.* 2001).

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

Barkite Site (Atanasov *et al.* 2001); Lakatnik (Guéorguiev & Guéorguiev 1995b; 1 ex., 05.V.1926, coll. of NMNH).

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

Beech forest at 1000 – 1100 m, Chernite Dupki Site W of Ledenika Hut (Atanasov *et al.* 2001); NP "Vrachanski Balkan" (Guéorguiev 2011).

***Pterostichus (Argutor) cursor* (Dejean, 1828)**

Near Gorna Bela rechka Vill. (Atanasov *et al.* 2001).

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

Near Gorna Bela Rechka Vill. (Atanasov *et al.* 2001).

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

Barkite Site, Parshevitsa Hut, near Toshova Mogila Peak, Chernite Dupki Site W of Ledenika Hut, Bohsnyashki Preslop (Atanasov *et al.* 2001); NP "Vrachanski Balkan" (Guéorguiev 2011); Varshets (Rambousek 1912, Hieke & Wrase 1988).

***Pterostichus (Morphnosoma) melanarius bulgaricus* (Lutshnik, 1915)**

Around cave Toshova Dupka, near Gorna Bela Rechka Vill., beech forest at 1000 – 1100 m, route Okolchitsa Peak – Chelopek Vill., Okolchitsa Peak (Atanasov *et al.* 2001).

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

Cherepish (Guéorguiev & Guéorguiev 1995b).

***Pterostichus (Pterostichus) bruckii* Schaum, 1859**

Barkite Site (Atanasov *et al.* 2001); NP "Vrachanski Balkan" (Guéorguiev 2011).

***Pterostichus (Rambousekiella) ledenikensis* (Knirsch, 1925)**

Ledenika Cave (Knirsch 1925, Guéorguiev & Beron 1962, Wrase 1991, Beron 2015,

Beron 2016, Kryzhanovskij, unpublished data); Grebenyo (Beron 1972, Beron 2015, Beron 2016); Vratsa, Dolno Ozirovo (Guéorguiev 1977); caves near Vratsa (Guéorguiev & Guéorguiev 1995b); NP "Vrachanski Balkan" (Guéorguiev 2011). **Troglobite**.

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

Bela Rechka Vill. (Guéorguiev & Guéorguiev 1995a, Guéorguiev & Guéorguiev 1995b).

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

Barkite Site, Chernite Dupki Site W of Ledenika Hut (Atanasov *et al.* 2001); Lakatnik (Rambousek 1912, Hieke & Wrase 1988).

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

Near Gorna Bela Rechka Vill., near Toshova Mogila Peak (Atanasov *et al.* 2001).

***Molops (Molops) robustus robustus* (Dejean, 1828)**

Chernite Dupki Site W of Ledenika Hut (Atanasov *et al.* 2001); NP "Vrachanski Balkan" (Guéorguiev 2011); Lakatnik (Kryzhanovskij, unpublished data).

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

Lakatnik, Varshets (Rambousek 1912); NP "Vrachanski Balkan" (Guéorguiev 2011).

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

Barkite Site, near Gorna Bela Rechka Vill., Chernite Dupki Site W of Ledenika Hut (Atanasov *et al.* 2001); NP "Vrachanski Balkan" (Guéorguiev 2011); Lakatnik (1 ex., 05.V.1926, coll. of NMNH).

***Tapinopterus (Tapinopterus) cognatus winkleri* Mandl, 1936**

NP "Vrachanski Balkan" (Guéorguiev 2011).

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

Around cave Toshova Dupka, Parshevitsa Hut, route Okolchitsa Peak – Chelopek Vill., route Okolchitsa Peak – Skaklya (Atanasov *et al.* 2001).

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

Lakatnik (Hieke & Wrase 1988); near Gorna Bela Rechka Vill., near Toshova Mogila Peak, Okolchitsa Peak (Atanasov *et al.* 2001); Vrachanski Balkan (4 ex., 18.VI.1922, I. Buresh leg., coll. of NMNH); Ledenika Cave (1 ex., 28.VI.1924, P. Drenski leg., coll. of NMNH).

***Calathus (Neocalathus) erratus erratus* C. R. Sahlberg, 1827**

Parshevitsa Hut (Atanasov *et al.* 2001).

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

Parshevitsa Hut, near Gorna Bela Rechka Vill., near Toshova Mogila Peak, route Okolchitsa Peak – Skaklya, reservoirs between Beglishka Mogila Peak and Parshevitsa Hut (Atanasov *et al.* 2001); Cherepish (2 ex., VIII.1906, D. Yoakimov leg., coll. of NMNH); Vrachanski Balkan (1 ex., 18.VI.1922, I. Buresh leg., coll. of NMNH).

***Laemostenus (Pristonychus) terricola punctatus* (Dejean, 1828)**

Parshevitsa Hut, near Toshova Mogila Peak (Atanasov *et al.* 2001); Vratsa ("Pr. Ledenik") (Hieke & Wrase 1988).

***Agonum (Agonum) marginatum* (Linnaeus, 1758)**

Reservoirs between Beglishka mogila Peak and Parshevitsa Hut (Atanasov *et al.* 2001); NP "Vrachanski Balkan" (Guéorguiev 2011).

***Agonum (Olisares) sexpunctatum* (Linnaeus, 1758)**

Bohsnyashki Preslop (Atanasov *et al.* 2001).

***Agonum (Olisares) viridicupreum* (Goeze, 1777)**

Reservoirs between Beglishka mogila Peak and Parshevitsa Hut (Atanasov *et al.* 2001); NP "Vrachanski Balkan" (Guéorguiev 2011); Lakatnik (1 ex., V.1909, coll. of NMPC).

***Limodromus assimilis* (Paykull, 1790)**

Barkite Site (Atanasov *et al.* 2001); NP "Vrachanski Balkan" (Guéorguiev 2011).

***Oxypselaphus obscurus* (Herbst, 1784)**

Lakatnik (Vasilev 1988, Wrase 1991); NP "Vrachanski Balkan" (Guéorguiev 2011).

***Anchomenus dorsalis dorsalis* (Pontoppidan, 1763)**

Near Gorna Bela Rechka Vill., route Okolchitsa Peak – Skaklya (Atanasov *et al.* 2001); Lakatnik (Guéorguiev & Guéorguiev 1995b; 1 ex., 15.V.1926, coll. of NMNH).

***Amara (Amara) aenea* (De Geer, 1774)**

Bohsnyashki Preslop, N Dolno Ozirovo Vill., Lakatnik, near Gorna Bela Rechka Vill., route Okolchitsa Peak – Chelopek Vill. (Atanasov *et al.* 2001); Lakatnik (Hieke & Wrase 1988).

***Amara (Amara) anthobia* A. Villa et G. B. Villa, 1833**

Lakatnik (Atanasov *et al.* 2001); Vratsa (Hieke & Wrase 1988).

***Amara (Amara) communis* (Panzer, 1797)**

Lakatnik (Rambousek 1912, Hieke & Wrase 1988).

***Amara (Amara) eurynota* (Panzer, 1796)**

N Dolno Ozirovo Vill., Parshevitsa Hut (Atanasov *et al.* 2001).

***Amara (Amara) familiaris* (Duftschmid, 1812)**

Barkite Site (Atanasov *et al.* 2001); Varshets (Hieke & Wrase 1988).

***Amara (Amara) ovata* (Fabricius, 1792)**

Around Toshova Dupka Cave (Atanasov *et al.* 2001).

***Amara (Amara) montivaga* Sturm, 1825**

Lakatnik (Atanasov *et al.* 2001).

***Amara (Amara) nitida* Sturm, 1825**

Barkite Site (Atanasov *et al.* 2001); Vrachanska Planina (Guéorguiev & Guéorguiev 1995b).

***Amara (Bradytus) apricaria* (Paykull, 1790)**

Okolchitsa Peak (Atanasov *et al.* 2001).

***Amara (Percosia) equestris equestris* (Duftschmid, 1812)**

Vratsa (Hieke & Wrase 1988).

***Amara (Curtonotus) aulica* (Panzer, 1796)**

Parshevitsa Hut (Atanasov *et al.* 2001).

***Zabrus (Pelor) spinipes spinipes* (Fabricius, 1798)**

Route Okolchitsa Peak – Chelopek Vill. (Atanasov *et al.* 2001).

***Anisodactylus (Anisodactylus) binotatus* (Fabricius, 1787)**

Reservoirs between Beglishka Mogila Peak and Parshevitsa Hut (Atanasov *et al.* 2001).

***Stenolophus (Stenolophus) teutonus* (Schrank, 1781)**

Near Gorna Bela Rechka Vill., Bohsnyashki Preslop, reservoirs between Beglishka Mogila Peak and Parshevitsa Hut (Atanasov *et al.* 2001).

***Stenolophus (Stenolophus) mixtus* (Herbst, 1784)**

Reservoirs between Beglishka Mogila Peak and Parshevitsa Hut (Atanasov *et al.* 2001).

***Acupalpus (Acupalpus) meridianus* (Linnaeus, 1760)**

Vratsa (Rambousek 1912, Guéorguiev & Guéorguiev 1995b).

***Parophonus (Parophonus) maculicornis* (Duftschmid, 1812)**

Lakatnik (Atanasov *et al.* 2001).

***Parophonus (Parophonus) mendax* (P. Rossi, 1790)**

Route Okolchitsa Peak – Skaklya (Atanasov *et al.* 2001).

***Ophonus (Metophonus) cordatus* (Duftschmid, 1812)**

Varshets (Rambousek 1912, Hieke & Wrase 1988, Vasilev1992).

***Ophonus (Hesperophonus) similis* (Dejean, 1829)**

Barkite Site (Atanasov *et al.* 2001).

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

Near Toshova Mogila Peak, route Okolchitsa Peak – Chelopek Vill., route Okolchitsa Peak – Skaklya, Okolchitsa Peak (Atanasov *et al.* 2001); Cherepish (Yoakimov 1904); Lakatnik (1 ex., 15.V.1926, I. Buresh leg., coll. of NMNH).

***Ophonus (Hesperophonus) subquadratus* (Dejean, 1829)**

Cherepish (Rambousek 1912).

***Ophonus (Hesperophonus) cribricollis* (Dejean, 1829)**

Cherepish (Yoakimov 1904).

***Ophonus (Ophonus) sabulicola* (Panzer, 1796)**

N Dolno Ozirovo Vill., route Okolchitsa Peak – Skaklya (Atanasov *et al.* 2001); Lakatnik (Guéorguiev & Guéorguiev 1995a, Guéorguiev & Guéorguiev 1995b; 1 ex., 15.V.1926, I. Buresh leg., coll. of NMNH).

***Harpalus (Pseudophonus) rufipes* (De Geer, 1774)**

Around Toshova Dupka Cave, Barkite Site, beech forest at 1000 – 1100 m, Vrachanska Planina, Okolchitsa Peak (Atanasov *et al.* 2001); Vratsa (1 ex., 09.VII.1968, J. Jelinek leg., coll. of NMPC).

***Harpalus (Pseudoophonus) calceatus* (Duftschmid, 1812)**

Cherepish (Rambousek 1912).

***Harpalus (Cryptophonus) tenebrosus* Dejean, 1829**

Lakatnik (Hieke & Wrase 1988).

***Harpalus (Harpalus) honestus* (Duftschmid, 1812)**

Near Gorna Bela Rechka Vill. (Atanasov *et al.* 2001).

***Harpalus (Harpalus) rubripes* (Duftschmid, 1812)**

Around Toshova Dupka Cave (Atanasov *et al.* 2001).

***Harpalus (Harpalus) atratus* Latreille, 1804**

Lakatnik (Hieke & Wrase 1988); Lakatnik, route Okolchitsa Peak – Skaklya (Atanasov *et al.* 2001).

***Harpalus (Harpalus) laevipes* Zetterstedt, 1828**

Chernite Dupki Site W of Ledenika Hut (Atanasov *et al.* 2001).

***Harpalus (Harpalus) serripes serripes* (Quensel, 1806)**

Lakatnik (Hieke & Wrase 1988); around Toshova Dupka Cave (Atanasov *et al.* 2001).

***Harpalus (Harpalus) flavicornis* Dejean, 1829**

N Dolno Ozirovo Vill. (Atanasov *et al.* 2001).

***Harpalus (Harpalus) pumilus* Sturm, 1818**

Near Gorna Bela Rechka Vill. (Atanasov *et al.* 2001).

***Harpalus (Harpalus) flavescens* (Piller et Mitterpacher, 1783)**

Mezdra (Yoakimov 1904, Guéorguiev & Guéorguiev 1995b).

***Harpalus (Harpalus) tardus* (Panzer, 1796)**

Around Cave Toshova Dupka, near Gorna Bela Rechka Vill., Chernite Dupki Site W of Ledenika Hut, route Okolchitsa Peak – Skaklya (Atanasov *et al.* 2001).

***Harpalus (Harpalus) latus* (Linnaeus, 1758)**

Parshevitsa Hut (Atanasov *et al.* 2001).

***Harpalus (Harpalus) cupreus fastuosus* Faldermann, 1836**

Reservoirs between Beglishka Mogila Peak and Parshevitsa Hut, Bohsnyashki Preslop (Atanasov *et al.* 2001).

***Harpalus (Harpalus) dimidiatus* (P. Rossi, 1790)**

Near Gorna Bela Rechka Vill., Route Okolchitsa Peak – Chelopek Vill., route Okolchitsa Peak – Skaklya (Atanasov *et al.* 2001); Mezdra (Yoakimov 1904).

***Harpalus (Harpalus) caspius* (Steven, 1806)**

Around Toshova Dupka Cave (Atanasov *et al.* 2001).

***Harpalus (Harpalus) pygmaeus* Dejean, 1829**

Mezdra (Yoakimov 1904, Guéorguiev & Guéorguiev 1995b).

***Harpalus (Harpalus) affinis* (Schrank, 1781)**

Near Gorna Bela Rechka Vill., Bohsnyashki Preslop (Atanasov *et al.* 2001).

***Harpalus (Harpalus) distinguendus distinguendus* (Duftschmid, 1812)**

Around Toshova Dupka Cave (Atanasov *et al.* 2001).

? *Harpalus (Harpalus) marginellus* Gyllenhal, 1827

Cherepish (Rambousek 1912, Guéorguiev & Guéorguiev 1995b).

Notes: This species is quite rare and its presence in the studied region must be confirmed with additional purposive researches. It is possible to be found in moderately moist to dry light forests and similar habitats at 700 – 1000 m a.s.l.

***Dixus obscurus* (Dejean, 1825)**

Mezdra (Guéorguiev & Guéorguiev 1995b).

***Panagaeus (Panagaeus) bipustulatus* (Fabricius, 1775)**

Near Gorna Bela Rechka Vill. (Atanasov *et al.* 2001).

***Chlaenius (Chlaenites) spoliatus spoliatus* (P. Rossi, 1792)**

Varshets, Vratsa (Rambousek 1912, Hieke & Wrase 1988).

***Chlaenius (Chlaeniellus) nitidulus* (Schrank, 1781)**

Varshets (Rambousek 1912, Hieke & Wrase 1988).

***Badister (Badister) bullatus* (Schrank, 1798)**

Lakatnik (Guéorguiev & Guéorguiev 1995b).

Lebia (Lamprias) cyanocephala cyanocephala (Linnaeus, 1758)

Cherepish (Rambousek 1912).

***Lebia (Lebia) cruxminor cruxminor* (Linnaeus, 1758)**

Vrachanska Planina (Guéorguiev & Guéorguiev 1995b; 3 ex., 23.VI.1938, J. Hlisnikowski leg., coll. of NMPC).

***Lebia (Lebia) scapularis scapularis* (Geoffroy, 1785)**

Varshets (Rambousek 1912, Guéorguiev & Guéorguiev 1995b).

***Philorhizus notatus* (Stephens, 1827)**

Lakatnik (Atanasov *et al.* 2001).

***Syntomus obscuroguttatus* (Duftschmid, 1812)**

Cherepish, Varshets (Rambousek 1912).

***Microlestes luctuosus luctuosus* Holdhaus, 1904**

Lakatnik (Hieke & Wrase 1988, Guéorguiev & Guéorguiev 1995b).

***Microlestes plagiatus* (Duftschmid, 1812)**

Cherepish (Guéorguiev & Guéorguiev 1995a, Guéorguiev & Guéorguiev 1995b; 1 ex., 25.IV.1909, coll. of NMPC).

***Cymindis (Cymindis) humeralis* (Geoffroy in Fourcroy, 1785)**

Route Okolchitsa Peak – Skaklya (Atanasov *et al.* 2001); Lakatnik (Rambousek 1912, Hieke & Wrase 1988, Guéorguiev & Guéorguiev 1995b).

Drypta (Drypta) dentata (P. Rossi, 1790)

Varshets (Hieke & Wrase 1988, Guéorguiev & Guéorguiev 1995b, Kryzhanovskij, unpublished data).

***Brachinus (Brachinus) crepitans* (Linnaeus, 1758)**

Vratsa (Rambousek 1912); Varshets (Guéorguiev & Guéorguiev 1995b); near Gorna Bela Rechka Vill. (Atanasov *et al.* 2001).

***Brachinus (Brachynidius) explodens* Duftschmid, 1812**

Vratsa (Rambousek 1912, Hieke & Wrase 1988, Guéorguiev & Guéorguiev 1995b); Barkite Site, near Gorna Bela Rechka Vill., route Okolchitsa Peak – Skaklya (Atanasov *et al.* 2001).

In concern of the ground beetles, the region of the Vrachanska Planina Mts. has a high conservation value. Currently one Tertiary relict (*Myas chalybaeus*) and 24 endemic species and subspecies are known, of which Balkan endemics are 7 taxa (1 species and 6 subspecies), Bulgarian endemics are 3 taxa (1 species and 2 subspecies), and local endemics are 14 taxa (7 species and 7 subspecies) (**Table 1**). Vrachanska Planina also appears as a centre of evolution of the endemic genus *Pheggomisetes*.

Carabus intricatus is a Natura 2000 species and is included in the IUCN Red List as "Near Threatened". *Carabus intricatus* and *Calosoma sycophanta* are included in the Annexes of CORINE and ESC Red List. In the Red Data Book of Bulgaria as "Vulnerable" is enlisted *Pheggomisetes bureschi* (Golemanski *et al.* 2015). *Carabus gigas* was protected by the Law on protection of nature (1967).

Some rare and stenotopic species occure in the studied region: *Abax parallelus*, *Amara communis*, *Calosoma sycophanta*, *Carabus cancellatus*, *Carabus granulatus*, *Cicindela transversalis*, *Elaphrus uliginosus*, *Leistus spinibarbis*, *Patrobus atrorufus*, most of the endemites. Some of the species (e.g. *Carabus intricatus* and *Carabus gigas*) have become rare under the influence of anthropogenic pressures and changes in their primary habitats. *Calosoma inquisitor*, *Calosoma sycophanta* and some of the *Carabus* species are usually highly sensitive to chemical agents, which affects their ranges and numbers (Huusela-Veistola 2000). 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 and local 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 1. List of the endemic ground beetles in Vrachanska Planina Mts.

Species	Level
Duvalius beroni	local
Duvalius papasoffi	local
Duvalius zivkovi	local
Pheggomisetes bureschi	local
Pheggomisetes globiceps (with 4 locally endemic subspecies)	local
Pheggomisetes radevi (with 3 locally endemic subspecies)	local
Pterostichus ledenikensis	local
Molops alpestris kalofericus	Bulgarian
Pterostichus melanarius bulgaricus	Bulgarian
Pterostichus vecors	Bulgarian
Carabus cancellatus intermedius	Balkan
Carabus scabriusculus bulgarus	Balkan
Carabus violaceus azuresens	Balkan
Cychrus semigranosus balcanicus	Balkan
Molops piceus bulgaricus	Balkan
Pterostichus bruckii	Balkan
Pterostichus melas depressus	Balkan
Tapinopterus cognatus winkleri	Balkan

Zoogeographical analysis on species level showed that the Northern Holarctic and European-Siberian faunal type prevails (46 species, 37% of all). It is followed by the European-Asiatic (28 species, 22%), Mediterranean (*sensu lato*) (21 species, 17%) and European faunal type (16 species, 13%). Endemic complex consists of 14 species (11%) (**Fig. 1**). Northern Holarctic and European-Siberian complex includes species distributed mainly in the northern regions of the Holarctic, mostly in Europe and Siberia. European-Asiatic species ranges lie between the Eurosiberian and Mediterranean zones. Mediterranean species are distributed in the so-called region of the "Ancient Mediterraneum" (Popov 1927, Kryzhanovskij 1965) and European faunal type includes mostly forest dwelling species connected to the middle and southern part of Europe.

Greatest number of species are Palaearctic, European-Central Asian, European-Neareastern, European-Siberian, Holarctic and Bulgarian local endemic (**Table 2**). Great number of endemics was established in another part of the Stara Planina Mts. too – "Leshnitsa" Nature Reserve (Teofilova 2016).

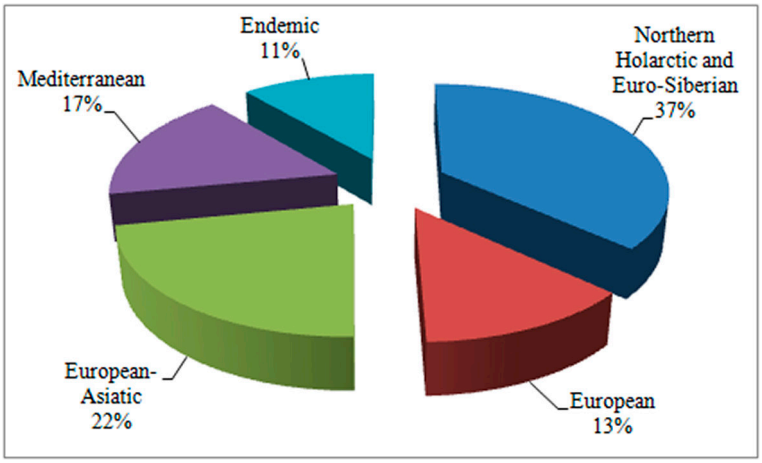

Fig. 1. Distribution of the carabid species among the zoogeographical complexes.

The ground beetles established for the area of Vrachanska Planina Mts. relate to two classes of life forms proposed by Sharova (1981), with clear predominance of class Zoophagous, presented by 80 species (64%). Mixophyitophagous are 45 species (36%). There are 22 life forms of ground beetles – 16 zoophagous and 6 mixophytophagous. Zoophagous life form groups are normally more numerous, especially in stable ecosystems (Sharova 1981) and in forest regions, as it was found in "Leshnitsa" Reserve (Teofilova 2016) and in Western Rhodope Mts. (with similar ratio between the two classes) (Teofilova *in press*).

The largest share of the species belong to the harpaloid geohortobionts from Class Mixophytophagous (27 species, 22%), followed by the digging litter & soil dwelling stratobionts (17 species, 14%) and crevice dwelling surface & litter stratobionts (15 species, 12%) from Class Zoophagous (**Fig. 2**).

In the studied part of the mountain mesophilous (44 species, 35%) and mesoxerophilous (42 species, 34%) ground beetles prevail. Hygrophilous are 18 species (15%), mesohygrophilous are 13 species (10%), and only 8 species are xerophilous (6%). This way the present study proves the predominantly mesophilous nature of the habitats, probably resulting from the large percentage of forest territories, with typical carabid coenoses. This pattern seems usual for the forest-mountain regions, as it was also established in the Western Rhodope Mts. (Teofilova *in press*).

As the studied area provides favourable natural conditions, various and diverse habitats and relatively great altitude range (from about 200 to about 1500 m a.s.l.), and considering the general richness of the carabids and the lack of targeted methodical studies, it is quite possible that the carabid fauna is more diverse. For general conclusions many

more localities have to be examined systematically.

The region of the Vrachanska Planina Mts. has a great importance for the ground beetles, since it is treasuring specific assemblages and species with conservation significance. The typical forest species are mostly representatives of the old European Nemoral complex and the endemics are stenotopic cave and forest dwellers, and the preserving of their characteristic habitats is a keystone for their conservation.

Table 2. Zoogeographical categories of the ground beetles in Vrachanska Planina Mts. (on species level).

Faunal type	Zoogeographical element	Number of species	%
Northern Holarctic and European-Siberian	Holarctic	8	6
	Palaearctic	18	14
	Western Palaearctic	5	4
	European-Siberian	11	9
	European and West Siberian	4	3
European	European	5	4
	Central European and Neareastern	5	4
	Central and Eastern European and Neareastern	1	1
	Central and Eastern European	5	4
Euroasiatic	Euroasiatic steppe and forest-steppe complex	6	5
	European and Central Asian	11	9
	European-Neareastern	11	9
Mediterranean	European- Central Asian -Mediterranean	7	6
	European-Neareastern-Mediterranean	6	5
	Mediterranean- Central Asian	1	1
	Eastmediterranean	1	1
	Pontic-Submediterranean	1	1
	South European and Northmediterranean	2	2
	Northmediterranean-Central Asian	1	1
	Balkan-Neareastern	2	2
Endemic	Balkan subendemic (Balkan-Carpathian)	3	2
	Balkan endemic	3	2
	Bulgarian endemic	1	1
	Bulgarian local endemic	7	6

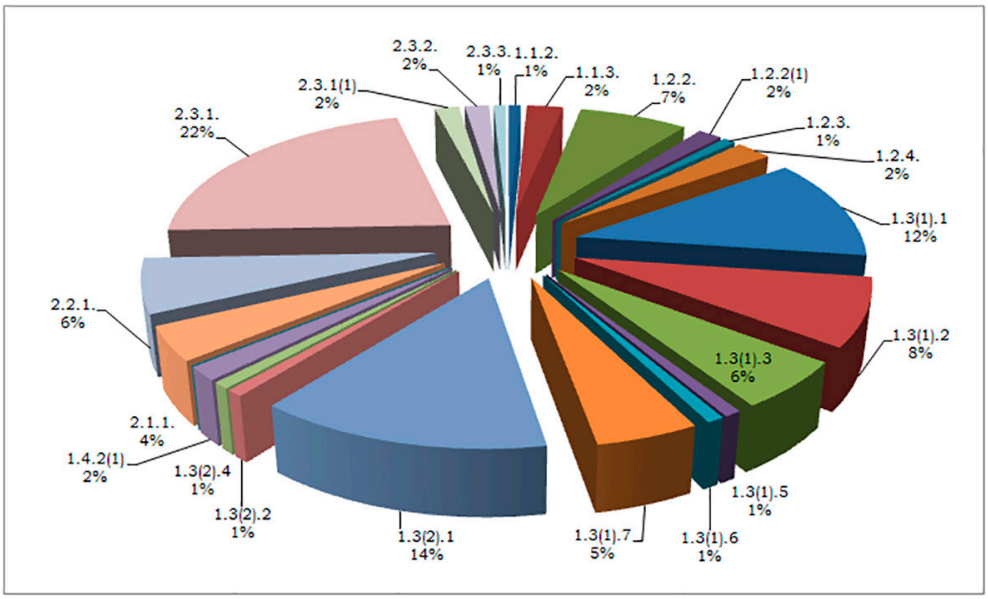

Fig. 2. Life forms of the ground beetles from the region of Vrachanska Planina Mts. Explanations of the codes are given in the Material and Methods section.

Due to the great species diversity, the high level of local and regional endemism, as well as the strong vulnerability of the stenotopic and endemic species of anthropogenic interventions, the preservation of the typical habitats is of utmost importance. The populations of old beech forests dwellers, such as *Carabus intricatus*, *Carabus gigas* and many Pterostichini, are particularly threatened. Vulnerable in relation to any changes of habitats, humidity and temperature also are the endemic cave dwellers of *Pheggomisetes*, *Duvalius* and *Rambousekiella*.

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Бръмбарите бегачи (Coleoptera: Carabidae) от района на Врачанска планина

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(Резюме)

Настоящото изследване представлява списък на бръмбарите бегачи (Coleoptera: Carabidae) от Врачанска планина и прилежащия Природен парк „Врачански Балкан". Видовият състав е изготвен въз основа на обобщената налична библиографска информация. Установени са общо 125 вида, сред които 24 ендемични вида и подвида, един терциерен реликт и няколко защитени, редки и стенотопни видове. Те се отнасят към 46 рода и 23 трибуса. Това съставлява съответно 17% от всички установени за България видове и 37% от родовете. Най-богато представени са трибусите Harpalini (32 вида), Pterostichini (19 вида), Amarini (12 вида) и Carabini (12 вида). Зоогеографският анализ показва преобладаването на Северния Холарктичен и Европейско-Сибирски комплекс. По отношение на жизнените форми на бегачите се установи, че преобладават зоофагите, представени от 80 вида (64%). Миксофитофаги са 45 вида (36%). По-голямата част от бръмбарите бегачи са мезофилни (44 вида, 35%) и мезоксерофилни (42 вида, 34%). Проучваният район се характеризира с наличието на благоприятни условия на средата и разнообразие от местообитания, съхраняващи специфични съобщества и видове с различен природозащитен статус. Консервационната значимост на Врачанска планина се допълва от факта, че тя се явява еволюционен център на ендемичния род *Pheggomizetes*. Недостатъчната проученост на района и голямото видовото богатство на изучаваната група предполагат, че бъдещи целенасочени изследвания биха допринесли за обогатяването на представения тук видов състав.

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ZooNotes, Supplement 7, Plovdiv University Press,
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Longhorn beetles (Coleoptera: Cerambycidae) from Vrachanska Planina Mountains and Vrachanski Balkan Nature Park

DENIS GRADINAROV, YANA PETROVA

Abstract. According to published and original data, 73 taxa of Cerambycidae are listed for Vrachanska Planina Mountains, Vrachanski Balkan Nature Park and neighboring regions of Western Stara Planina Mts. Localities of 49 of the taxa are situated in Vrachanska Planina Mts. and those of 47 are situated within the territory of Vrachanski Balkan Natural Park. The species *Vadonia hirsuta* (K. Daniel & J. Daniel, 1891) is reported for the first time for Bulgaria. Second locality of *Phytoecia uncinata* (W. Redtenbacher, 1842) for the country is also recorded. After a revision of museum matherial new locality of *Leiopus linnei* Wallin, Nylander & Kvamme, 2009 was recorded. Three species – *Rosalia alpina* (Linnaeus, 1758), *Morimus asper funereus* Mulsant, 1863 and *Phytoecia tigrina* (Mulsant, 1851) are included in Annexes of the Directive 92/43/EEC on the conservation of natural habitats and wild fauna and flora. Presence of numerous individuals of *Ph. tigrina* in localities within the territory of Vrachanski Balkan Nature Park was observed and a host plant, *Anchusa barrelieri* (All.), was recorded for the species in Bulgaria.

Key words: Cerambycidae, Bulgaria, Stara Planina Mountain, protected areas, distribution

Introduction

No special research of longhorn beetles (Coleoptera: Cerambycidae) of Vrachanska Planina Mts. or Vrachanski Balkan Nature Natural Park have been carried out until now. Separate data about the distribution of Cerambycidae species in the study area or the neighboring regions of Western Stara Planina Mts. can be found in a number of publications (e.g. Nedelkov 1905, 1909; Heyrovský 1931; Kantardjiewa-Minkova 1932, 1934; Minkova 1957, 1961; Ganev 1985, 1986; Georgiev 2011; Doychev *et al.* 2017). List of Cerambycidae species from Western Stara Planina Mts. was published by Georgiev (2011). The aim of the present study was to complete the list of species of Cerambycidae for Vrachanska Planina Mts. and Vrachanski Balkan Nature Natural Park on the basis of literature data, available specimens, preserved in museum collections as well as newly collected material.

Materials and methods

For the preparation of the species list both literature data and newly collected material from the study area were used. In addition, Cerambycidae specimens (used in the cited publications or unpublished) from Coleoptera collection, preserved in National Museum of Natural History (Sofia), were examined by the first author.

There are only few species records of Cerambycidae, which certainly concern the study area in the literature (e.g. Georgiev 2011, Gradinarov 2016, Doychev *et al.* 2017). The localities in older literature sources, including data from this region of Western Stara Planina Mts., are not indicated sufficiently precisely and their situation within Vrachanska Planina Mts. or Vrachanski Balkan Nature Park is questionable. In the preparation of the present list we also included data from localities in close proximity to the study area, in particular those indicated as "Vratsa" and "Lakatnik". Some of these reports and findings may concern the survey area, or the species reported most probably occur as well in it.

The main part of the new material was collected by the authors from late April to July 2017 from the vicinity of the villages Milanovo (UTM FN97) and Ochindol (UTM GN07), Vrachanska Planina Mts., as well as along the road between Lakatnik Railway Station and Milanovo Vill. Previously collected material by the first author was also used. The specimens from Vrachanski Karst Reserve (UTM GN08) were collected with sweeping and with pitfall traps by Ilia Gjonov and Albena Gjonova (Sofia University "St. Kliment Ohridski"), respectlively. The newly collected material, used in the present study, is deposited in the collection of Department of Zoology and Anthropology, Faculty of Biology, Sofia University "St. Kliment Ohridski" (BFUS).

Identification of the species was performed by the first author. The systematic of Cerambycidae, used in preparing of the list, is according Danilevsky (2017). For the species of particular interest, new data on the biology or a brief discussion are given.

The following abbreviations are used: VPM – Vrachanska Planina Mts.; VBP – Vrachanski Balkan Park; DG – Denis Gradinarov; YP – Yana Petrova; rev. – revised material by D. Gradinarov; NN – collection of Nikola Nedelkov; ex. – specimen/s; 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 or for the neighboring regions; ** – the species is new for the country.

List of species

Cerambycidae Latreille, 1802
Prioninae Blanchard, 1845
Prionini Latreille, 1802

***Prionus coriarius* (Linnaeus, 1758)**

Vrachanski Balkan, Ledenika Cave, [VBP, GN08] (Georgiev 2011: 70).

Lepturinae Latreille, 1802

Lepturini Latreille, 1802

****Alosterna tabacicolor tabacicolor*** **(De Geer, 1775)**

New data: VPM, 3 km S Milanovo Vill., meadows, VBP, FN97, 43°05.378'N 23°24.126'E, 510 m, 19.v.2017, 2 ♂♂, 1 ♀, hand collection, DG & YP leg. (BFUS).

****Anastrangalia dubia dubia*** **(Scopoli, 1763)**

New data: VPM, Vrachanski Karst Reserve, near Skaklia Waterfall, VBP, GN08, 43°10.674'N 23°33.518'E, 890 m, 07.vii.2016, 1 ♀, sweeping, Ilia Gjonov leg. (BFUS); VPM, 2 km S Ochindol Vill., meadows, VBP, GN07, 43°05.247'N 23°28.397'E, 410 m, 04.vi.2017, 1 ♂, 2 ♀♀, hand collection, DG & YP leg. (BFUS).

Anastrangalia sanguinolenta **(Linnaeus, 1760)**

Vratsa (Nedelkov 1905: 409, as *Leptura sanguinolenta* L.).

****Pachytodes cerambyciformis*** **(Schrank, 1781)**

New data: VPM, near Ochindol Vill., meadows and roadside verges, GN07, 43°06.152'N 23°28.707'E, 575 m, 04.vi.2017, 1 ♂, hand collection, DG & YP leg. (BFUS); VPM, 2 km S Ochindol Vill., meadows and roadside verges, VBP, GN07, 43°05.257'N 23°28.417'E, 420 m, 04.vi.2017, 1 ♀, hand collection, DG & YP leg. (BFUS).

****Pachytodes erraticus*** **(Dalman, 1817)**

New data: Vratsa – vineyards (in Cyrillic), 12.vii. [without year], 1 ex., S. Minkova leg. (NMNHS); VPM, 2 km S Ochindol Vill., meadows and roadside verges, VBP, GN07, 43°05.257'N 23°28.417'E, 420 m, 19.v.2017, 3 ♂♂, hand collection, DG & YP leg. (BFUS); VPM, 3 km S Milanovo Vill., meadows, VBP, FN97, 43°05.378'N 23°24.126'E, 510 m, 19.v.2017, 1 ♂, hand collection, DG & YP leg. (BFUS); VPM, 2 km S Ochindol Vill., meadows and roadside verges, VBP, GN07, 43°05.257'N 23°28.417'E, 420 m, 04.vi.2017, 3 ♂♂, 1 ♀, hand collection, DG & YP leg. (BFUS); VPM, 3 km S Milanovo Vill., meadows, VBP, FN97, 43°05.378'N 23°24.126'E, 510 m, 04.vi.2017, 7 ♂♂, 2 ♀♀, hand collection, DG & YP leg. (BFUS); VPM, 2 km S Ochindol Vill., meadows, VBP, GN07, 43°05.247'N 23°28.397'E, 410 m, 04.vi.2017, 1 ♀, hand collection, DG & YP leg. (BFUS); VPM, 3 km S Milanovo Vill., meadows, VBP, FN97, 43°05.354'N 23°24.103'E, 480 m, 04.vi.2017, 2 ♂♂, hand collection, DG & YP leg. (BFUS); VPM, near Milanovo Vill., meadows, FN97, 43°06.730'N 23°23.716'E, 830 m, 19.vii.2017, 1 ♂, hand collection, DG & Boyan Zlatkov leg. (BFUS).

****Pseudovadonia livida setosa*** **Danilevsky, 2013**

New data: VPM, 2 km S Ochindol Vill., meadows and roadside verges, VBP, GN07, 43°05.257'N 23°28.417'E, 420 m, 19.v.2017, 10 ♂♂, 3 ♀♀, hand collection, DG & YP leg. (BFUS); VPM, near Ochindol Vill., meadows and roadside verges, GN07, 43°06.152'N 23°28.707'E, 575 m, 19.v.2017, 1 ♂, hand collection, DG & YP leg. (BFUS); VPM, 1,5 km S Ochindol Vill., meadows and roadside verges, VBP, GN07, 43°05.559'N 23°28.706'E, 470 m, 04.vi.2017, 1 ♂, hand collection, DG & YP leg. (BFUS); VPM, 2 km S Ochindol Vill., meadows, VBP, GN07, 43°05.247'N 23°28.397'E, 410 m, 04.vi.2017, 2 ♀♀, hand collection,

DG & YP leg. (BFUS); VPM, near Ochindol Vill., meadows and roadside verges, GN07, 43°06.152'N 23°28.707'E, 575 m, 04.vi.2017, 6 ♂♂, 2 ♀♀, hand collection, DG & YP leg. (BFUS).

***Rutpela maculata maculata* (Poda von Neuhaus, 1761)**

Vratsa, Troposhansko Place (Nedelkov 1909: 13, as *Leptura maculata* Poda); Vratsa (Heyrovský 1931: 80, as *Strangalia maculata* Poda., Kantardjiewa-Minkova 1932: 89, as *Strangalia maculata* Poda.); rev.: Vratsa (in Cyrillic), 7.vii.1906, 1 ex., NN, L. Heyrovský det. as *Strangalia maculata* (NMNHS); Vratsa (in Cyrillic), 8.vii.1906, 1 ex., NN (NMNHS).

New data: VPM, Vrachanski Karst Reserve, near Skaklia Waterfall, VBP, GN08, 43°10.674'N 23°33.518'E, 890 m, 07.vii.2016, 2 ♂♂, sweeping, Ilia Gjonov leg. (BFUS); VPM, 2 km S Ochindol Vill., meadows, VBP, GN07, 43°05.247'N 23°28.397'E, 410 m, 04.vi.2017, 1 ♀, hand collection, DG & YP leg. (BFUS); VPM, 1,5 km S Ochindol Vill., meadows and roadside verges, VBP, GN07, 43°05.559'N 23°28.706'E, 470 m, 04.vi.2017, 3 ♂♂, hand collection, DG & YP leg. (BFUS); VPM, 2 km S Ochindol Vill., meadows and roadside verges, VBP, GN07, 43°05.257'N 23°28.417'E, 420 m, 04.vi.2017, 1 ♂, hand collection, DG & YP leg. (BFUS).

****Stenurella* (*Nigrostenurella*) *nigra nigra* (Linnaeus, 1758)**

New data: VPM, 2,5 km S Milanovo Vill., roadside verge, VBP, FN97, 43°05.633'N 23°23.940'E, 530 m, 11.v.2017, 1 ♀, hand collection, DG leg. (BFUS); VPM, near Ochindol Vill., meadows and roadside verges, GN07, 43°06.152'N 23°28.707'E, 575 m, 19.v.2017, 1 ♂, hand collection, DG & YP leg. (BFUS); VPM, 3 km S Milanovo Vill., meadows, VBP, FN97, 43°05.378'N 23°24.126'E, 510 m, 19.v.2017, 8 ♂♂, 2 ♀♀, hand collection, DG & YP leg. (BFUS); VPM, 2 km S Ochindol Vill., meadows and roadside verges, VBP, GN07, 43°05.257'N 23°28.417'E, 420 m, 19.v.2017, 4 ♂♂, 8 ♀♀, hand collection, DG & YP leg. (BFUS); VPM, 2 km S Ochindol Vill., meadows and roadside verges, VBP, GN07, 43°05.257'N 23°28.417'E, 420 m, 04.vi.2017, 1 ♂, 1 ♀, hand collection, DG & YP leg. (BFUS); VPM, 1,5 km S Ochindol Vill., meadows and roadside verges, VBP, GN07, 43°05.559'N 23°28.706'E, 470 m, 04.vi.2017, 1 ♂, 1 ♀, hand collection, DG & YP leg. (BFUS); VPM, near Ochindol Vill., meadows and roadside verges, GN07, 43°06.152'N 23°28.707'E, 575 m, 04.vi.2017, 2 ♂♂, 2 ♀♀, hand collection, DG & YP leg. (BFUS); VPM, 2 km S Ochindol Vill., meadows, VBP, GN07, 43°05.247'N 23°28.397'E, 410 m, 04.vi.2017, 2 ♂♂, 1 ♀, hand collection, DG & YP leg. (BFUS); VPM, 3 km S Milanovo Vill., meadows, VBP, FN97, 43°05.378'N 23°24.126'E, 510 m, 04.vi.2017, 1 ♀, hand collection, DG & YP leg. (BFUS).

****Stenurella* (*Priscostenurella*) *bifasciata bifasciata* (O. F. Müller, 1776)**

New data: Vratsa (in Cyrillic), 8.vii.1906, 1 ex., NN (NMNHS); VPM, near Ochindol Vill., meadows and roadside verges, GN07, 43°06.152'N 23°28.707'E, 575 m, 04.vi.2017, 1 ♀, hand collection, DG & YP leg. (BFUS); VPM, near Milanovo Vill., meadows, FN97, 43°06.730'N 23°23.716'E, 830 m, 19.vii.2017, 1 ♂, hand collection, DG & Boyan Zlatkov leg. (BFUS); VPM, near Milanovo Vill., meadows, FN97, 43°07.407'N 23°23.530'E, 890 m, 19.vii.2017, 1 ♀, hand collection, DG & Boyan Zlatkov leg. (BFUS); VPM, 1 km N Milanovo Vill., meadows, VBP, FN97, 43°07.634'N 23°23.413'E, 990 m, 19.vii.2017, 1 ♀, hand collection, DG & Boyan Zlatkov leg. (BFUS); Lakatnishki Skali, near „Septemvrijtsi 1923" Monument, meadows, VBP, FN97, 43°05.460'N 23°23.100'E, 675 m, 23.vii.2017,

1 ♂, 1 ♀, hand collection, DG & YP leg. (BFUS); VPM, near Ochindol Vill., roadside verge, GN07, 43°06.152'N 23°28.707'E, 575 m, 23.vii.2017, 1 ♂, hand collection, DG & YP leg. (BFUS); VPM, near Ochindol Vill., roadside verge, GN07, 43°06.330'N 23°28.693'E, 600 m, 23.vii.2017, 1 ♂, 1 ♀, hand collection, DG & YP leg. (BFUS).

****Stenurella* (*Priscostenurella*) *septempunctata septempunctata* (Fabricius, 1792)**

New data: Vratsa (in Cyrillic), 3 ex., NN (NMNHS); VPM, 1,5 km S Ochindol Vill., meadows and roadside verges, VBP, GN07, 43°05.501'N 23°28.701'E, 470 m, 04.vi.2017, 1 ♂, 2 ♀♀, hand collection, DG & YP leg. (BFUS); VPM, 1,5 km S Ochindol Vill., meadows and roadside verges, VBP, GN07, 43°05.559'N 23°28.706'E, 470 m, 04.vi.2017, 4 ♂♂, 4 ♀♀, hand collection, DG & YP leg. (BFUS); VPM, 2 km S Ochindol Vill., meadows and roadside verges, VBP, GN07, 43°05.257'N 23°28.417'E, 420 m, 04.vi.2017, 2 ♀♀, hand collection, DG & YP leg. (BFUS); VPM, 2 km S Ochindol Vill., meadows, VBP, GN07, 43°05.247'N 23°28.397'E, 410 m, 04.vi.2017, 3 ♂♂, 3 ♀♀, hand collection, DG & YP leg. (BFUS); VPM, 3 km S Milanovo Vill., meadows, VBP, FN97, 43°05.378'N 23°24.126'E, 510 m, 04.vi.2017, 1 ♂, 2 ♀♀, hand collection, DG & YP leg. (BFUS); VPM, near Milanovo Vill., meadows, FN97, 43°06.730'N 23°23.716'E, 830 m, 19.vii.2017, 1 ♂, hand collection, DG & Boyan Zlatkov leg. (BFUS); VPM, near Milanovo Vill., meadows, FN97, 43°07.407'N 23°23.530'E, 890 m, 19.vii.2017, 1 ♂, hand collection, DG & Boyan Zlatkov leg. (BFUS).

***Stenurella* (*Stenurella*) *melanura melanura* (Linnaeus, 1758)**

Vratsa (Nedelkov 1905: 409, as *Leptura melanura* L.); rev.: Vratsa (in Cyrillic), vii.1906, 1 ex., NN, L. Heyrovský det. as *Strangalia melanura* (NMNHS).

New data: VPM, Vrachanski Karst Reserve, near Skaklia Waterfall, VBP, GN08, 43°10.674'N 23°33.518'E, 890 m, 07.vii.2016, 2 ♂♂, sweeping, Ilia Gjonov leg. (BFUS); VPM, 2 km NE Milanovo Vill., meadows, VBP, FN97, 43°08.202'N 23°23.869'E, 1015 m, 18.vii.2017, 1 ♂, 2 ♀♀, hand collection, DG & Boyan Zlatkov leg. (BFUS); VPM, 1 km N Milanovo Vill., meadows, VBP, FN97, 43°07.634'N 23°23.413'E, 990 m, 19.vii.2017, 2 ♂♂, hand collection, DG & Boyan Zlatkov leg. (BFUS); VPM, 2 km N Milanovo Vill., meadows, VBP, FN97, 43°08.179'N 23°23.537'E, 1005 m, 19.vii.2017, 3 ♂♂, 1 ♀, hand collection, DG & Boyan Zlatkov leg. (BFUS).

****Stictoleptura* (*Maculileptura*) *pallens* (Brullé, 1832)**

New data: VPM, 1,5 km S Ochindol Vill., roadside verge, VBP, GN07, 43°05.559'N 23°28.706'E, 470 m, 04.vi.2017, 2 ♂♂, hand collection, DG & YP leg. (BFUS).

***Stictoleptura* (*Paracorymbia*) *fulva* (De Geer, 1775)**

Vratsa (Kantardjiewa-Minkova 1932: 89, as *Leptura fulva* Deg.); rev.: Vratsa (in Cyrillic), [without date], NN (NMNHS).

New data: VPM, Milanovo Vill., roadside verge, FN97, 43°07.025'N 23°23.669'E, 845 m, 23.vii.2017, 3 ♂♂, 1 ♀, hand collection, DG & YP leg. (BFUS); VPM, near Milanovo Vill., meadows, FN97, 43°07.407'N 23°23.530'E, 890 m, 23.vii.2017, 1 ♂, hand collection, DG & YP leg. (BFUS).

***Stictoleptura* (*Stictoleptura*) *cordigera cordigera* (Füesslins, 1775)**

Vratsa, Troposhansko Place (Nedelkov 1905: 409, as *Leptura cordigera* Fussly); rev.: Vratsa (in Cyrillic), 7.vii.1906, 1 ex., NN, L. Heyrovský det. as *Leptura cordigera* (NMNHS); Vratsa (in Cyrillic), 7.vii.1906, 1 ex., NN (NMNHS); Vratsa (in Cyrillic), 8.vii.1906, 1 ex., NN (NMNHS); Vratsa (in Cyrillic), vii.1906, 1 ex., NN (NMNHS); Vratsa (in Cyrillic), [without date], 1 ex., NN (NMNHS).

New data: VPM, 1 km SE Ochin Dol Vill., meadows, VBP, GN07, 43°05.879'N 23°29.049'E, 650 m, 23.vii.2017, 1 ♂, hand collection, DG & YP leg. (BFUS).

***Strangalia attenuata* (Linnaeus, 1758)**

Vratsa (Nedelkov 1905: 409, as *Leptura attenuata* L., Heyrovský 1931: 81); rev.: Vratsa (in Cyrillic), 8.vii.1906, 1 ex., NN (NMNHS); Vratsa (in Cyrillic), vii.1906, 1 ex., NN, L. Heyrovský det. as *Typocerus attenuata* (NMNHS); Vratsa (in Cyrillic), vii.1906, 1 ex., NN (NMNHS); Vratsa (in Cyrillic), [without date], 3 ex., NN (NMNHS).

*****Vadonia hirsuta* (K. Daniel & J. Daniel, 1891)** (Fig. 1)

New data: VPM, 2 km S Ochindol Vill., meadows and roadside verges, VBP, GN07, 43°05.257'N 23°28.417'E, 420 m, 19.v.2017, 3 ♂♂, hand collection, DG & YP leg. (BFUS); VPM, near Ochindol Vill., meadows and roadside verges, GN07, 43°06.152'N 23°28.707'E, 575 m, 04.vi.2017, 6 ♂♂, 1 ♀, hand collection, DG & YP leg. (BFUS).

First record of the species from Bulgaria. *V. hirsuta* was described from Hârşova, Romania. Danilevsky (2014: 261-263) reexamined the type series of the species and reported new findings from Romanian Dobruja. According Danilevsky (2014: 262) the species probably also occurrs in Ukraine and Moldova. The species was also reported from Mt. Fruška Gora, Serbia (Pil & Stojanović 2005: 27; 2007: 40), but these reports are considered doubtful due to the significant distance from its known distribution area (Ilić & Ćurčić, 2015: 22). The present record from Vrachanska Planina Mts. significantly expands the known areal of *V. hirsuta* and its presence in Serbia does not seem impossible.

In appearance *V. hirsuta* is similar to *Vadonia unipunctata* (Fabricius, 1787) (Fig. 1A). The penis apex is slightly dilated (Fig. 1C), parameres are similar to those of *V. unipunctata* (Fig. 1D). Main distinctive character of *V. hirsuta* is the presence of long erect setae on all femora (Danilevsky (2014: 263) (Fig. 1B). By this character *V. hirsuta* specimens, collected near Ochindol Vill., clearly differ from those of *V. unipunctata* from Milanovo Vill. (next taxon in the list).

***Vadonia unipunctata unipunctata* (Fabricius, 1787)**

Vratsa (Nedelkov 1909: 13, as *Leptura unipunctata* Fab.).

New data: VPM, 2 km N Milanovo Vill., meadows, VBP, FN97, 43°08.179'N 23°23.537'E, 1005 m, 19.vii.2017, 1 ♂, 1 ♀, hand collection, DG & Boyan Zlatkov leg. (BFUS); VPM, near Milanovo Vill., meadows, FN97, 43°07.407'N 23°23.530'E, 890 m, 19.vii.2017, 2 ♂♂, hand collection, DG & Boyan Zlatkov leg. (BFUS).

Rhagiini Kirby, 1837

***Cortodera flavimana flavimana* (Waltl, 1838)**

Vratsa (Nedelkov 1909: 13).

New data: VPM, 3 km S Milanovo Vill., meadow, VBP, FN97, 43°05.461'N 23°23.873'E, 440 m, 29.iv.2017, 1 ♂, 1 ♀, hand collection, on *Ranunculus* sp., DG leg. (BFUS).

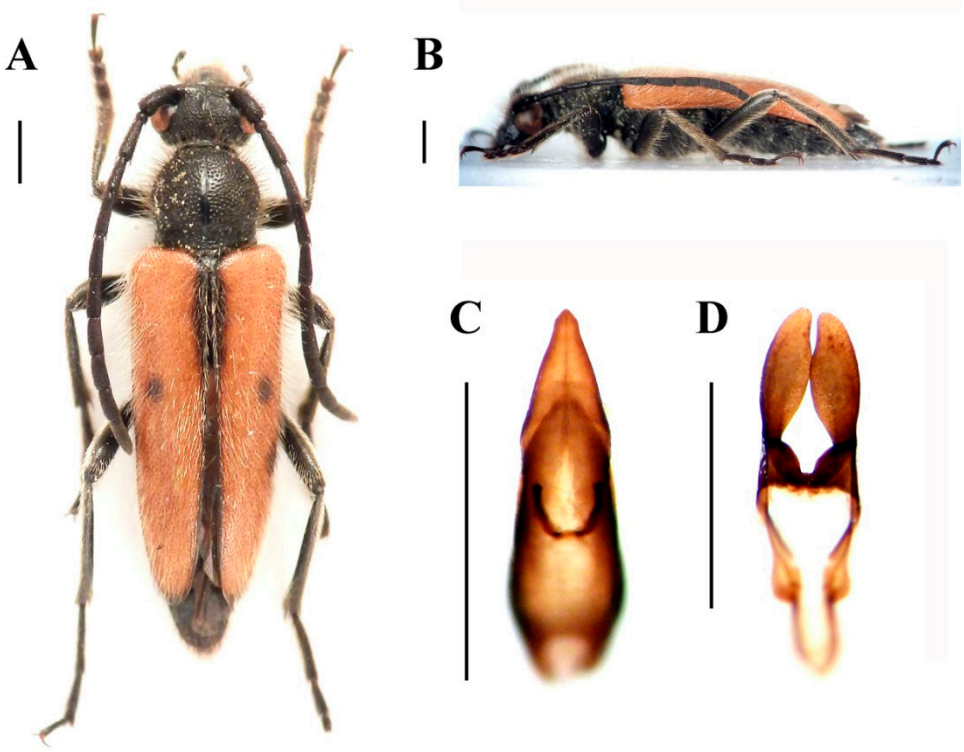

Fig. 1. *Vadonia hirsuta* (K. Daniel & J. Daniel, 1891) from Ochindol Vill., 04.vi.2017. **A**: Male, general view; **B**: Male, lateral view; **C**: penis apex; **D**: parameres. Scale bars: 1 mm.

****Dinoptera collaris* (Linnaeus, 1758)**

New data: VPM, 2,5 km S Milanovo Vill., roadside verge, VBP, FN97, 43°05.633'N 23°23.940'E, 530 m, 11.v.2017, 4 ♂♂, 2 ♀♀, hand collection, DG leg. (BFUS); VPM, 2 km S Milanovo Vill., roadside verge, VBP, FN97, 43°05.846'N 23°23.928'E, 580 m, 11.v.2017, 1 ♂, hand collection, DG leg. (BFUS); VPM, near Milanovo Vill., FN97, 43°06.567'N 23°23.766'E, 845 m, 11.v.2017, 1 ♂, 1 ♀, hand collection, on *Crataegus monogyna* Jacq., DG leg. (BFUS); VPM, 3 km S Milanovo Vill., meadows, VBP, FN97, 43°05.378'N 23°24.126'E, 510 m, 19.v.2017, 11 ♂♂, 7 ♀♀, hand collection, on Euphorbiaceae, DG & YP leg. (BFUS); VPM, 3 km S Milanovo Vill., meadows, VBP, FN97, 43°05.378'N 23°24.126'E, 510 m, 04.vi.2017, 1 ♀, hand collection, DG & YP leg. (BFUS); VPM, 1,5 km S Ochindol Vill., meadows and

roadside verges, VBP, GN07, 43°05.501'N 23°28.701'E, 470 m, 04.vi.2017, 1 ♀, hand collection, DG & YP leg. (BFUS); VPM, 2 km S Ochindol Vill., meadows and roadside verges, VBP, GN07, 43°05.257'N 23°28.417'E, 420 m, 04.vi.2017, 1 ♀, hand collection, DG & YP leg. (BFUS); VPM, 2,5 km S Milanovo Vill., meadows, VBP, FN97, 43°05.475'N 23°24.063'E, 525 m, 04.vi.2017, 1 ♀, hand collection, DG leg. (BFUS).

***Rhagium* (*Megarhagium*) *mordax* (De Geer, 1775)**

Vratsa (Kantardjiewa-Minkova 1932: 86); rev.: Vratsa (in Cyrillic), vii.1906, 1 ex., NN (NMNHS).

***Rhagium* (*Megarhagium*) *sycophanta* (Schrank, 1781)**

Vratsa (Nedelkov 1909: 13, Kantardjiewa-Minkova 1932: 85).

****Rhagium* (*Rhagium*) *inquisitor inquisitor* (Linnaeus, 1758)**

New data: Lakatnik (in Cyrillic), iv.1949, 2 ex., P. Drenski leg. (NMNHS).

***Stenocorus* (*Anisorus*) *quercus quercus* (Götz, 1783)**

Vratsa (Minkova 1957: 542, Ganev 1985: 148).

***Stenocorus* (*Stenocorus*) *meridianus* (Linnaeus, 1758)**

Vratsa (Nedelkov 1905: 410, as *Toxotus meridianus* Panz.); rev.: Vratsa (in Cyrillic), [without date], 1 ex., NN (NMNHS).

Cerambycinae Latreille, 1802

Anaglyptini Lacordaire, 1868

***Anaglyptus* (*Anaglyptus*) *mysticus* (Linnaeus, 1758)**

Lakatnik (Kantardjiewa-Minkova 1932: 98); rev.: Lakatnik, Sofia district (in Cyrillic), 15.v.1926, 1 ex., Dr. I. Buresch leg. (NMNHS).

New data: VPM, near Milanovo Vill., FN97, 43°06.567'N 23°23.766'E, 845 m, 11.v.2017, 2 ♀♀, hand collection, on *Crataegus monogyna* Jacq., DG leg. (BFUS).

Callidiini Kirby, 1837

****Phymatodes* (*Phymatodellus*) *rufipes rufipes* (Fabricius, 1777)**

New data: VPM, near Milanovo Vill., FN97, 43°06.561'N 23°23.768'E, 845 m, 11.v.2017, 1 ♀, hand collection, on *Crataegus monogyna* Jacq., DG leg. (BFUS).

***Phymatodes* (*Phymatodes*) *testaceus* (Linnaeus, 1758)**

Lakatnik (Kantardjiewa-Minkova 1932: 94); rev.: Lakatnik Vill., Sofia district (in Cyrillic), 15.v.1926, 1 ex., [collector unknown] (NMNHS).

****Ropalopus* (*Ropalopus*) *clavipes* (Fabricius, 1775)**

New data: Vratsa (in Cyrillic), [without date], 1 ex., NN (NMNHS).

Cerambycini Latreille, 1802

***Cerambyx* (*Cerambyx*) *nodulosus nodulosus* Germar, 1817**

Lakatnik (Minkova 1957: 546-547).

***Cerambyx* (*Microcerambyx*) *scopolii scopolii* Fuessly, 1775**

Lakatnik (Georgiev 2011: 74).

Clytini Mulsant, 1839

***Chlorophorus* (*Humeromaculatus*) *figuratus* (Scopoli, 1763)**

Vratsa (Nedelkov 1905: 413, as *Clytanthus figuratus* Scop., Kantardjiewa-Minkova 1932: 98); rev.: Vratsa (in Cyrillic), [without date], 1 ex., NN (NMNHS).

New data: VPM, 3 km S Milanovo Vill., meadows, VBP, FN97, 43°05.378'N 23°24.126'E, 510 m, 19.v.2017, 5 ♂♂, hand collection, DG & YP leg. (BFUS); VPM, 2 km S Ochindol Vill., meadows, VBP, GN07, 43°05.247'N 23°28.397'E, 410 m, 04.vi.2017, 1 ♂, 1 ♀, hand collection, DG & YP leg. (BFUS); VPM, near Ochindol Vill., meadows and roadside verges, GN07, 43°06.152'N 23°28.707'E, 575 m, 04.vi.2017, 1 ♂, hand collection, DG & YP leg. (BFUS); VPM, 1,5 km S Ochindol Vill., meadows and roadside verges, VBP, GN07, 43°05.559'N 23°28.706'E, 470 m, 04.vi.2017, 4 ♂♂, hand collection, DG & YP leg. (BFUS); VPM, 3 km S Milanovo Vill., meadows, VBP, FN97, 43°05.378'N 23°24.126'E, 510 m, 04.vi.2017, 1 ♀, hand collection, DG & YP leg. (BFUS).

****Chlorophorus* (*Perderomaculatus*) *sartor* (O. F. Müller, 1766)**

New data: VPM, 1 km SE Ochin Dol Vill., meadows, VBP, GN07, 43°06.131'N 23°29.059'E, 660 m, 23.vii.2017, 1 ♂, hand collection, DG & YP leg. (BFUS); VPM, Milanovo Vill., roadside verge, FN97, 43°07.025'N 23°23.669'E, 845 m, 23.vii.2017, 1 ♂, 1 ♀, hand collection, DG & YP leg. (BFUS).

****Clytus* (*Clytus*) *arietis arietis* (Linnaeus, 1758)**

New data: VPM, Vrachanski Karst Reserve, Manastirski Dol area, VBP, GN08, 43°10.735'N 23°34.711'E, 510 m, 17.iv.2016, 1 ♂, sweeping, Ilia Gjonov leg. (BFUS); VPM, near Milanovo Vill., FN97, 43°06.763'N 23°23.733'E, 825 m, 11.v.2017, 1 ♂, 1 ♀, hand collection, on *Crataegus monogyna* Jacq., DG leg. (BFUS).

***Clytus* (*Clytus*) *lama* Mulsant, 1847**

Vratsa (Nedelkov 1905: 413, Kantardjiewa-Minkova 1932: 96).

****Clytus* (*Clytus*) *rhamni temesiensis* (Germar, 1824)**

New data: Vratsa (in Cyrillic), [without date], 1 ex., NN (NMNHS); VPM, 2 km S Ochindol Vill., meadows, VBP, GN07, 43°05.247'N 23°28.397'E, 410 m, 04.vi.2017, 1 ♀, hand collection, DG & YP leg. (BFUS); VPM, 1,5 km S Ochindol Vill., meadows and roadside verges, VBP, GN07, 43°05.559'N 23°28.706'E, 470 m, 04.vi.2017, 1 ♂, 1 ♀, hand collection, DG & YP leg. (BFUS); VPM, 2,5 km S Milanovo Vill., meadows, VBP, FN97, 43°05.475'N 23°24.063'E, 525 m, 04.vi.2017, 1 ♀, hand collection, DG leg. (BFUS); VPM, 1 km N Milanovo Vill., meadows, VBP, FN97, 43°07.634'N 23°23.413'E, 990 m, 19.vii.2017, 1 ♂, 1 ♀, hand collection, DG & Boyan Zlatkov leg. (BFUS); VPM, near Milanovo Vill., meadows, FN97, 43°07.407'N 23°23.530'E, 890 m, 19.vii.2017, 1 ♂, 1 ♀, hand collection, DG & Boyan Zlatkov leg. (BFUS); VPM, near Milanovo Vill., meadows, FN97, 43°06.730'N 23°23.716'E, 830 m, 19.vii.2017, 1 ♂, hand collection, DG & Boyan Zlatkov leg. (BFUS).

***Echinocerus floralis* (Pallas, 1773)**

Vratsa (Nedelkov 1905: 413, as *Plagionotus floralis* Pall., Kantardjiewa-Minkova, 1932: 97, as *Plagionotus floralis* Pall.); rev.: Vratsa (in Cyrillic), [without date], 2 ex., NN (NMNHS).

****Isotomus speciosus speciosus* (D. H. Schneider, 1787)**

New data: Vratsa (in Cyrillic), 7.vii.1906, 1 ex., NN (NMNHS).

Hesperophanini Mulsant, 1839

***Stromatium auratum* (Böber, 1793)**

Levishte, Iskarski Prolom (Georgiev 2011: 55, as *Stromatium unicolor* (Olivier, 1795)).

Molorchini Gistel, 1848

****Molorchus* (*Molorchus*) *umbellatarum umbellatarum* (Schreber, 1759)**

New data: VPM, 1,5 km S Ochindol Vill., meadows and roadside verges, VBP, GN07, 43°05.501'N 23°28.701'E, 470 m, 04.vi.2017, 1 ♀, hand collection, on Apiaceae, DG & YP leg. (BFUS).

Rosaliini Fairmaire, 1864

***Rosalia* (*Rosalia*) *alpina alpina* (Linnaeus, 1758)**

Vrachanski Balkan, Parshevitsa Chalet, [VBP, GN08] (Georgiev 2011: 75); Vratsa Balkan, SW Borov Kamak loc. [VBP, GN08] (Doychev *et al.* 2017: 520).

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: VPM, near Ochindol Vill., meadows and roadside verges, GN07, 43°06.152'N 23°28.707'E, 575 m, 04.vi.2017, 1 ♀, hand collection, DG & YP leg. (BFUS).

****Callimus* (*Callimus*) *angulatus angulatus* (Schrank, 1789)**

New data: VPM, 1 km N Milanovo Vill., VBP, FN97, 43°07.683'N 23°23.383'E, 980 m, 11.v.2014, 2 ♂♂, 1 ♀, hand collection, on *Crataegus monogyna* Jacq., DG leg. (BFUS).

***Stenopterus flavicornis* Küster, 1846**

Vratsa (Nedelkov 1905: 412, Kantardjiewa-Minkova 1932: 92); rev.: Vratsa (in Cyrillic), [without date], 7 ex., NN (NMNHS).

New data: VPM, Milanovo Vill., roadside verge, FN97, 43°07.025'N 23°23.669'E, 845 m, 23.vii.2017, 1 ♂, 2 ♀♀, hand collection, DG & YP leg. (BFUS); VPM, near Milanovo Vill., meadows, FN97, 43°07.407'N 23°23.530'E, 890 m, 23.vii.2017, 2 ♂♂, hand collection, DG & YP leg. (BFUS).

***Stenopterus rufus geniculatus* Kraatz, 1863**

Vratsa (Nedelkov 1905: 413, as *Stenopterus rufus* L.); rev.: Vratsa (in Cyrillic),

[without date], 1 ♂, 1 ♀, NN (NMNHS).

New data: VPM, Vrachanski Karst Reserve, near Skaklia Waterfall, VBP, GN08, 43°10.674'N 23°33.518'E, 890 m, 07.vii.2016, 3 ♂♂, 2 ♀♀, sweeping, Ilia Gjonov leg. (BFUS); VPM, 2 km S Ochindol Vill., meadows and roadside verges, VBP, GN07, 43°05.257'N 23°28.417'E, 420 m, 19.v.2017, 1 ♂, 1 ♀, hand collection, DG & YP leg. (BFUS); VPM, near Ochindol Vill., meadows and roadside verges, GN07, 43°06.152'N 23°28.707'E, 575 m, 04.vi.2017, 1 ♂, hand collection, DG & YP leg. (BFUS); VPM, 2 km S Ochindol Vill., meadows, VBP, GN07, 43°05.247'N 23°28.397'E, 410 m, 04.vi.2017, 3 ♂♂, hand collection, DG & YP leg. (BFUS); VPM, 1 km N Milanovo Vill., meadows, VBP, FN97, 43°07.634'N 23°23.413'E, 990 m, 19.vii.2017, 1 ♀, hand collection, DG & Boyan Zlatkov leg. (BFUS); VPM, Milanovo Vill., roadside verge, FN97, 43°07.025'N 23°23.669'E, 845 m, 23.vii.2017, 1 ♂, 1 ♀, hand collection, DG & YP leg. (BFUS).

Lamiinae Latreille, 1825

Acanthocinini Blanchard, 1845

***Leiopus* (*Leiopus*) *linnei* Wallin, Nylander & Kvamme, 2009**

Vrachanski Balkan (Kantardjiewa-Minkova 1934: 136, as *Leiopus nebulosus* L.); rev.: Bulgaria, Vratza Balcan, 18.vi.1922, 1 ♀, Coll. Dr. I. Buresch, L. Heyrovský det. as *Leiopus nebulosus* (NMNHS).

The species *L. linnei* was separated from *L. nebulosus* (Linnaeus, 1758) by Wallin *et al.* (2009). The same authors report *L. linnei* from Bulgaria without concrete locality (Wallin *et al.* 2009: 33). Later the same species have been reported from Rabisha Vill., Vidin district (Gutowski *et al.* 2010: 280). The specimen of *Leiopus* Audinet-Serville, 1835 in NMMHS collection, most probably used by Kantardjiewa-Minkova (1934) in the report of *L. nebulosus* from Vrachanski Balkan, was identified as *L. linnei* as well (Gradinarov, present study). The species *L. nebulosus* has been considered as widespread in Bulgaria (Migliaccio *et al.* 2007: 38), but in fact old records may actually concern the sibling species *L. linnei* (Gradinarov, unpublished data). Moreover, the presence of *L. nebulosus* in Eastern Europe may by questionable (after Rossa *et al.* 2017: 275). Revision of the distribution of species from the genus *Leiopus* in Bulgaria is desirable.

Acanthoderini J. Thomson, 1860

***Aegomorphus clavipes* (Schrank, 1781)**

Vratsa (Nedelkov 1905: 414, as *Acanthoderes clavipes* Schrank., Kantardjiewa-Minkova 1934: 136, as *Acanthoderes clavipes* Schrnk.); Lakatnik (Ganev 1985: 151, as *Acanthoderes clavipes* Schrnk.); rev.: Vratsa (in Cyrillic), [without date], 1 ex., NN (NMNHS).

Agapanthiini Mulsant, 1839

***Agapanthia* (*Agapanthia*) *cardui* (Linnaeus, 1767)**

New data: VPM, 1 km S Milanovo Vill., roadside verge, VBP, FN97, 43°06.290'N 23°23.532'E, 700 m, 11.v.2017, 1 ♀, hand collection, on Asteraceae, DG leg. (BFUS); VPM, 1,5 km S Ochindol Vill., VBP, GN07, 43°05.448'N 23°28.476'E, 400 m, 19.v.2017, 2 ♂♂, hand collection, on Asteraceae, DG & YP leg. (BFUS); VPM, 2 km S Ochindol Vill., meadows and roadside verges, VBP, GN07, 43°05.257'N 23°28.417'E, 420 m, 19.v.2017, 1 ♀, hand collection, DG & YP leg. (BFUS); VPM, near Ochindol Vill., meadows and roadside verges, GN07, 43°06.152'N 23°28.707'E, 575 m, 19.v.2017, 1 ♂, 2 ♀♀, hand collection, DG & YP

leg. (BFUS); VPM, near Ochindol Vill., meadows and roadside verges, GN07, 43°06.152'N 23°28.707'E, 575 m, 04.vi.2017, 1 ♀, hand collection, DG & YP leg. (BFUS); VPM, 1,5 km S Ochindol Vill., meadows and roadside verges, VBP, GN07, 43°05.559'N 23°28.706'E, 470 m, 04.vi.2017, 1 ♂, hand collection, DG & YP leg. (BFUS).

***Agapanthia (Epoptes) dahli dahli (C. F. W. Richter, 1820)**

New data: VPM, 2,5 km S Milanovo Vill., roadside verge, VBP, FN97, 43°05.497'N 23°24.015'E, 500 m, 19.v.2017, 1 ♂, hand collection, DG leg. (BFUS).

***Agapanthia (Epoptes) villosoviridescens (De Geer, 1775)**

New data: VPM, Vrachanski Karst Reserve, Manastirski Dol area, VBP, GN08, 43°10.735'N 23°34.711'E, 510 m, 15.v.2016, 1 ♂, sweeping, Ilia Gjonov leg. (BFUS).

***Agapanthia (Smaragdula) violacea* (Fabricius, 1775)**

Lakatnik (Georgiev 2011: 76).

New data: Vratsa (in Cyrillic), 8.vii.1906, 1 ex., NN (NMNHS); Vrachanska Plan[ina Mts.], Okolchitsa - Chelopek Vill., 600-850 m, VBP, 01.vii.1997, 1 ex., B. Guéorguiev leg. (NMNHS); VPM, 2,5 km S Milanovo Vill., roadside verge, VBP, FN97, 43°05.633'N 23°23.940'E, 530 m, 29.iv.2017, 2 ♂♂, 3 ♀♀, hand collection, on Asteraceae, DG leg. (BFUS); VPM, 2 km S Milanovo Vill., roadside verge, VBP, FN97, 43°05.774'N 23°23.962'E, 590 m, 29.iv.2017, 1 ♂, 1 ♀, hand collection, on *Anchusa barrelieri* (All.), DG leg. (BFUS); VPM, 2 km S Milanovo Vill., roadside verge, VBP, FN97, 43°05.793'N 23°23.908'E, 560 m, 29.iv.2017, 1 ♂, hand collection, on *Anchusa barrelieri* (All.), DG leg. (BFUS); VPM, 3 km S Milanovo Vill., meadows, VBP, FN97, 43°05.354'N 23°24.103'E, 480 m, 29.iv.2017, 1 ♂, hand collection, DG leg. (BFUS); VPM, 3 km S Milanovo Vill., roadside verge, VBP, FN97, 43°05.511'N 23°23.912'E, 470 m, 29.iv.2017, 1 ♀, hand collection, DG leg. (BFUS); VPM, 3 km S Milanovo Vill., roadside verge, VBP, FN97, 43°05.309'N 23°23.848'E, 410 m, 29.iv.2017, 4 ♂♂, 6 ♀♀, hand collection, on *Papaver* sp., DG leg. (BFUS); VPM, 1 km S Milanovo Vill., roadside verge, VBP, FN97, 43°06.290'N 23°23.532'E, 700 m, 11.v.2017, 1 ♀, hand collection, on Asteraceae, DG leg. (BFUS); VPM, near Milanovo Vill., agricultural field, FN97, 43°06.642'N 23°23.730'E, 840 m, 11.v.2017, 1 ♀, hand collection, DG leg. (BFUS); VPM, 2 km S Ochindol Vill., meadows and roadside verges, VBP, GN07, 43°05.257'N 23°28.417'E, 420 m, 19.v.2017, 2 ♂♂, 1 ♀, hand collection, DG & YP leg. (BFUS); VPM, 3 km S Milanovo Vill., meadows, VBP, FN97, 43°05.378'N 23°24.126'E, 510 m, 19.v.2017, 1 ♂, hand collection, DG & YP leg. (BFUS); VPM, 2 km S Ochindol Vill., meadows and roadside verges, VBP, GN07, 43°05.257'N 23°28.417'E, 420 m, 04.vi.2017, 1 ♂, 1 ♀, hand collection, DG & YP leg. (BFUS); VPM, 2,5 km S Milanovo Vill., roadside verge, VBP, FN97, 43°05.497'N 23°24.015'E, 500 m, 04.vi.2017, 2 ♂♂, hand collection, YP & DG leg. (BFUS); VPM, near Ochindol Vill., meadows and roadside verges, GN07, 43°06.152'N 23°28.707'E, 575 m, 04.vi.2017, 1 ♂, hand collection, DG & YP leg. (BFUS).

***Agapanthia (Synthapsia) kirbyi (Gyllenhal, 1817)**

New data: VPM, 2 km S Ochindol Vill., meadows, VBP, GN07, 43°05.247'N 23°28.397'E, 410 m, 04.vi.2017, 4 ♂♂, 1 ♀, hand collection, on *Verbascum* sp., DG & YP leg. (BFUS).

Dorcadionini Swainson, 1840

****Dorcadion* (*Carinatodorcadion*) *fulvum erythropterum* Fischer von Waldheim, 1823**

New data: VPM, Vrachanski Karst Reserve, near Ledenika lift station, meadows, VBP, GN08, 43°11.650'N 23°29.783'E, 960 m, 07.vi.2016 - 08.vii.2016, 2 ♂♂, pitfall traps, Albena Gjonova leg. (BFUS).

***Dorcadion* (*Carinatodorcadion*) *aethiops aethiops* (Scopoli, 1763)**

Lakatnik (Kantardjiewa-Minkova 1934: 132); rev.: Lakatnik (in Cyrillic), 25.iii.1930, 1 ex., D. Papazov leg. (NMNHS).

***Dorcadion* (*Cribridorcadion*) *axillare* Küster, 1847**

Vratsa Balkan [VPM] (Dascălu & Fusu 2012: 38).

****Dorcadion* (*Cribridorcadion*) *pedestre pedestre* (Poda von Neuhaus, 1761)**

New data: VPM, Vrachanska Planina Mt., Okolchitsa Peak - Skaklya [Waterfall], VBP, GN08, 600-900 m, 02.vii.1997, 1 ex., B. Guéorguiev leg. (NMNHS).

***Dorcadion* (*Cribridorcadion*) *scopolii* (Herbst, 1784)**

Vratsa (Nedelkov 1905: 416, Heyrovský 1931: 83, Kantardjiewa-Minkova 1934: 133, Minkova 1961: 300).

***Dorcadion* (*Cribridorcadion*) *tauricum tauricum* Waltl, 1838**

Vratsa, Troposhansko Place (Nedelkov 1909: 15, as *Dorcadion nigritarse* Steven); Vratsa (Minkova 1961: 304).

New data: VPM, Vrachanski Karst Reserve, near Ledenika lift station, meadows, VBP, GN08, 43°11.650'N 23°29.783'E, 960 m, 07.vi.2016 - 08.vii.2016, 1 ♂, pitfall traps, Albena Gjonova leg. (BFUS).

***Neodorcadion bilineatum* (Germar, 1824)**

Lakatnik (Heyrovský 1931: 83).

Lamiini Latreille, 1825

****Herophila tristis tristis* (Linnaeus, 1767)**

New data: VPM, Vrachanski Karst Reserve, Voyvodin Dol area, deciduous forest, VBP, GN08, 43°11.200'N 23°31.883'E, 600 m, 07.vi.2016 - 08.vii.2016, 2 ♀♀, pitfall traps, Albena Gjonova leg. (BFUS).

****Morimus asper funereus* Mulsant, 1863**

New data: VPM, near Milanovo Vill., roadside verge, FN97, 43°06.570'N 23°23.465'E, 790 m, 25.vi.2014, 1 ♀, hand collection, DG leg. (BFUS); VPM, Vrachanski Karst Reserve, Voyvodin Dol area, deciduous forest, VBP, GN08, 43°11.200'N 23°31.883'E, 600 m, 07.vi.2016 - 08.vii.2016, 1 ♀, pitfall traps, Albena Gjonova leg. (BFUS).

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)**

Vratsa (Nedelkov 1905: 415, Kantardjiewa-Minkova 1934: 136); rev.: Vratsa (in Cyrillic), [without date], 1 ex., NN (NMNHS).

New data: Iskarski Prolom Gorge, Lakatnishki Skali, near "Temnata Dupka" cave, roadside verge, VBP, FN97, 43°05.291'N 23°22.975'E, 390 m, 11.v.2017, 1 ♀, hand collection, DG leg. (BFUS).

***Mesosa* (*Mesosa*) *curculionoides* (Linnaeus, 1760)**

Vratsa (Nedelkov 1905: 415, as *Mesosa curculionides* L., Kantardjiewa-Minkova 1934: 135); rev.: Vratsa (in Cyrillic), [without date], 1 ex., NN (NMNHS).

Monochamini Gistel, 1848

****Monochamus galloprovincialis pistor* (Germar, 1818)**

New data: VPM, 3 km S Milanovo Vill., roadside verge, VBP, FN97, 43°05.445'N 23°23.871'E, 450 m, 23.vii.2017, 1 ♀, at flight, YP leg. (BFUS).

Phytoeciini Mulsant, 1839

****Phytoecia* (*Opsilia*) *coerulescens* (Scopoli, 1763)**

New data: Lakatnik Vill., Sofia district (in Cyrillic), 15.v.1926, 1 ex., Coll. Dr. I. Buresch (NMNHS); VPM, 2 km S Milanovo Vill., roadside verge, VBP, FN97, 43°05.850'N 23°23.905'E, 580 m, 29.iv.2017, 1 ♂, hand collection, on *Anchusa barrelieri* (All.), DG leg. (BFUS); VPM, 3 km S Milanovo Vill., roadside verge, VBP, FN97, 43°05.430'N 23°23.895'E, 450 m, 19.v.2017, 1 ♀, hand collection, on *Anchusa barrelieri* (All.), DG & YP leg. (BFUS); VPM, 2,5 km S Milanovo Vill., roadside verge, VBP, FN97, 43°05.497'N 23°24.015'E, 500 m, 19.v.2017, 1 ♂, hand collection, on *Anchusa barrelieri* (All.), DG leg. (BFUS); VPM, 3 km S Milanovo Vill., meadows, VBP, FN97, 43°05.378'N 23°24.126'E, 510 m, 04.vi.2017, 1 ♂, 1 ♀, hand collection, DG & YP leg. (BFUS).

****Phytoecia* (*Opsilia*) *uncinata* (W. Redtenbacher, 1842)** (Fig. 2)

New data: VPM, 2,5 km S Milanovo Vill., roadside verge, VBP, FN97, 43°05.633'N 23°23.940'E, 530 m, 29.iv.2017, 2 ♂♂, hand collection, on *Anchusa barrelieri* (All.), DG leg. (BFUS); VPM, 2 km S Milanovo Vill., roadside verge, VBP, FN97, 43°05.793'N 23°23.908'E, 560 m, 29.iv.2017, 4 ♂♂, 3 ♀♀, hand collection, on *Anchusa barrelieri*, DG leg. (BFUS); VPM, 2 km S Milanovo Vill., roadside verge, VBP, FN97, 43°05.850'N 23°23.905'E, 580 m, 29.iv.2017, 1 ♂, hand collection, on *Anchusa barrelieri*, DG leg. (BFUS); VPM, 3 km S Milanovo Vill., roadside verge, VBP, FN97, 43°05.430'N 23°23.895'E, 450 m, 11.v.2017, 2 ♂♂, 1 ♀, hand collection, on *Cerinthe minor* L., DG leg. (BFUS); VPM, 2 km S Milanovo Vill., roadside verge, VBP, FN97, 43°05.846'N 23°23.928'E, 580 m, 11.v.2017, 1 ♂, 1 ♀, hand collection, on *Cerinthe minor*, DG leg. (BFUS); VPM, 3 km S Milanovo Vill., roadside verge, VBP, FN97, 43°05.430'N 23°23.895'E, 450 m, 19.v.2017, 1 ♀, hand collection, on *Cerinthe minor*, DG & YP leg. (BFUS).

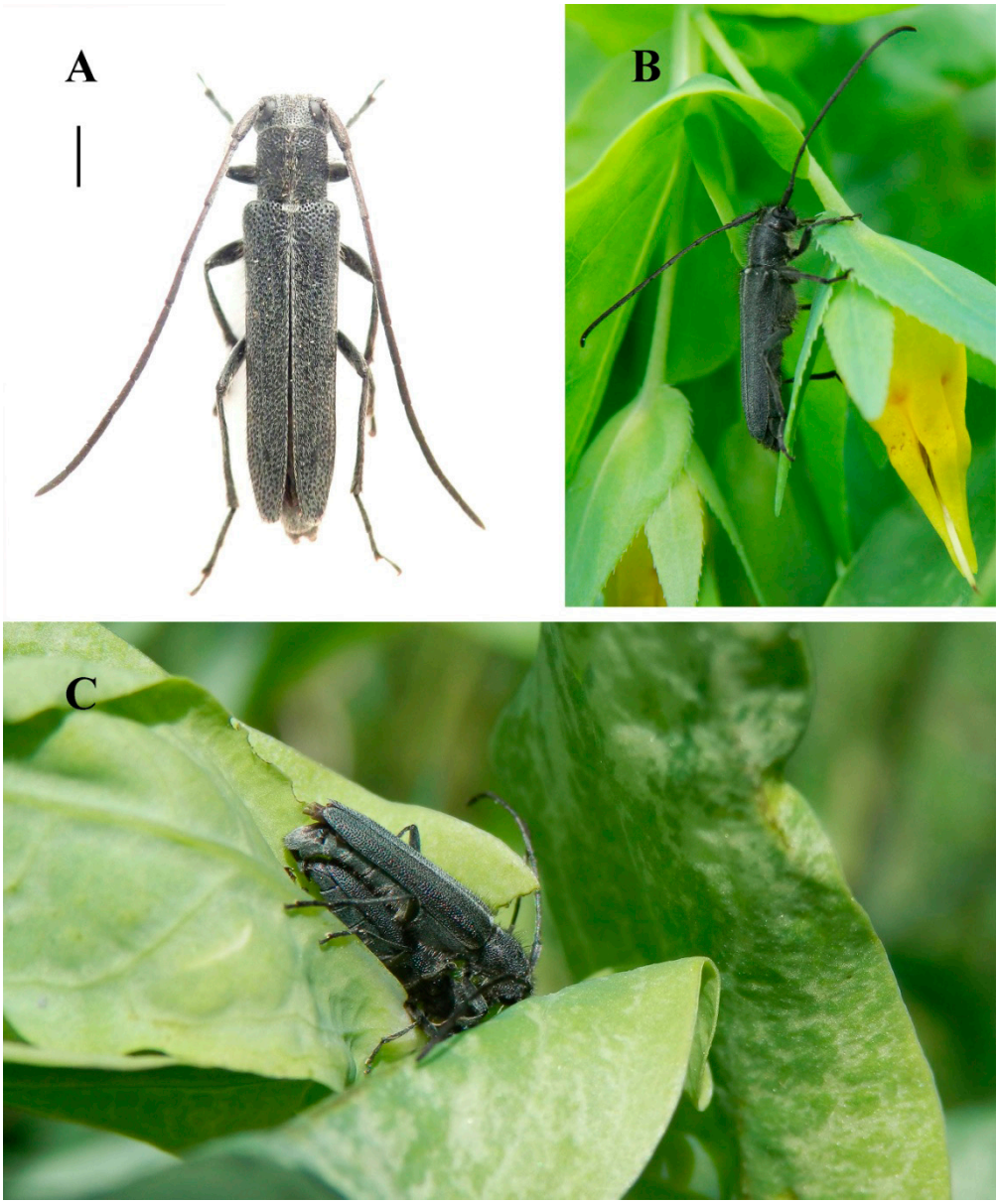

Fig. 2. *Phytoecia uncinata* (W. Redtenbacher, 1842) from Vtachanska Planina Mts. **A**: Male, general view; **B**: Male on *Cerinthe minor* L.; **C**: Mating individuals on the host plant, 11.v.2017. Scale bar: 1 mm.

The species was reported from Bulgaria only once from Maglizh (Heyrovský 1931: 84). Host plants of *Ph. uncinata* are species of *Cerinthe* L. (Migliaccio *et al.* 2007: 53). Findings on *A. barrelieri* is probably accidental and is related to the relatively later development of the host plant *C. minor* in the study habitat in the spring. The species was regarded as rare in Bulgaria (Migliaccio *et al.* 2007: 53).

***Phytoecia (Phytoecia) cylindrica (Linnaeus, 1758)**

New data: VPM, Vrachanski Karst Reserve, Voyvodin Dol area, VBP, GN08, 43°11.412'N 23°31.762'E, 450 m, 15.v.2016, 1 ♂, sweeping, Ilia Gjonov leg. (BFUS); VPM, Vrachanski Karst Reserve, near Skaklia Waterfall, VBP, GN08, 43°10.674'N 23°33.518'E, 890 m, 17.iv.2016, 1 ♂, sweeping, Ilia Gjonov leg. (BFUS); VPM, 3 km S Milanovo Vill., meadows, VBP, FN97, 43°05.378'N 23°24.126'E, 510 m, 19.v.2017, 1 ♂, hand collection, DG & YP leg. (BFUS).

***Phytoecia (Phytoecia) pustulata pustulata (Schrank, 1776)**

New data: VPM, Vrachanski Karst Reserve, near Ledenika lift station, meadows, VBP, GN08, 43°11.637'N 23°29.749'E, 970 m, 14.v.2016, 1 ♀, sweeping, Ilia Gjonov leg. (BFUS).

***Phytoecia (Phytoecia) virgula (Charpentier, 1825)**

New data: Iskarski Prolom Gorge, Lakatnishki Skali, riverside meadows, VBP, FN97, 43°05.285'N 23°23.236'E, 385 m, 29.iv.2017, 1 ♀, hand collection, DG leg. (BFUS).

***Phytoecia (Pilemia) tigrina* (Mulsant, 1851)** (Figs. 3, 4)

Vrachanska Planina Mts., between Lakatnik and Milanovo Vill., VBP, FN97 (Gradinarov 2016: 1-3, as *Pilemia tigrina* (Mulsant, 1851)).

New data: VPM, 3 km S Milanovo Vill., roadside verge, VBP, FN97, 43°05.407'N 23°24.072'E, 490 m, 29.iv.2017, 2 ♂♂, 4 ♀♀, hand collection, on *Anchusa barrelieri*, DG leg. (BFUS); VPM, 3 km S Milanovo Vill., roadside verge, VBP, FN97, 43°05.511'N 23°23.912'E, 470 m, 29.iv.2017, 2 ♀♀, hand collection, on *Anchusa barrelieri*, DG leg. (BFUS); VPM, 3 km S Milanovo Vill., roadside verge, VBP, FN97, 43°05.430'N 23°23.895'E, 450 m, 29.iv.2017, 2 ♂♂, 2 ♀♀, hand collection, on *Anchusa barrelieri*, DG leg. (BFUS); VPM, 2 km S Milanovo Vill., roadside verge, VBP, FN97, 43°05.850'N 23°23.905'E, 580 m, 29.iv.2017, 5 ♂♂, 11 ♀♀, hand collection, on *Anchusa barrelieri*, DG leg. (BFUS); VPM, 2 km S Milanovo Vill., roadside verge, VBP, FN97, 43°05.774'N 23°23.962'E, 590 m, 29.iv.2017, 9 ♂♂, 10 ♀♀, hand collection, on *Anchusa barrelieri*, DG leg. (BFUS); VPM, 2 km S Milanovo Vill., roadside verge, VBP, FN97, 43°05.990'N 23°23.742'E, 620 m, 11.v.2017, 2 ♂♂, hand collection, on *Anchusa barrelieri*, DG leg. (BFUS); VPM, 2,5 km S Milanovo Vill., roadside verge, VBP, FN97, 43°05.497'N 23°24.015'E, 500 m, 19.v.2017, 2 ♂♂, hand collection, on *Anchusa barrelieri*, DG leg. (BFUS); VPM, 2,5 km S Milanovo Vill., roadside verge, VBP, FN97, 43°05.497'N 23°24.015'E, 500 m, 04.vi.2017, 4 ♂♂, hand collection, on *Anchusa barrelieri*, DG leg. (BFUS). Numerous specimens were observed on the host plants during the study period without being collected: 29.iv.2017 - about 100 individuals (all sites), 11.v.2017 -

about 70 individuals (all sites), 19.v.2017 – about 30 individuals (single site), 04.vi.2017 – about 20 individuals (single site). All of them were found on the host plant *Anchusa barrelieri* right beside the road (Fig. 4A, B, C). Maiting individials (Fig. 4 C) were observed from the end of April to the beginning of June.

Ph. tigrina is known from several localities in Bulgaria and was regarded as rare (Migliaccio *et al.* 2007: 57). The species was reported from Iskarski Prolom Gorge - Cherepishki Manastir Monastery (Nedelkov 1905: 415 and from Sofia (Kantardjieva-Minkova 1934: 140, as *Pilemia tigrina* Muls.). Recently, Gradinarov (2016: 1-3) reported the species by a single male from Vrachanska Planina Mts. (the same habitat in which the species is found in the present study) as well as from Ivanovo Vill., Shumen region. The present study confirms the presence of a stable population on the territory of the Vrachanski Balkan Nature Park. 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).

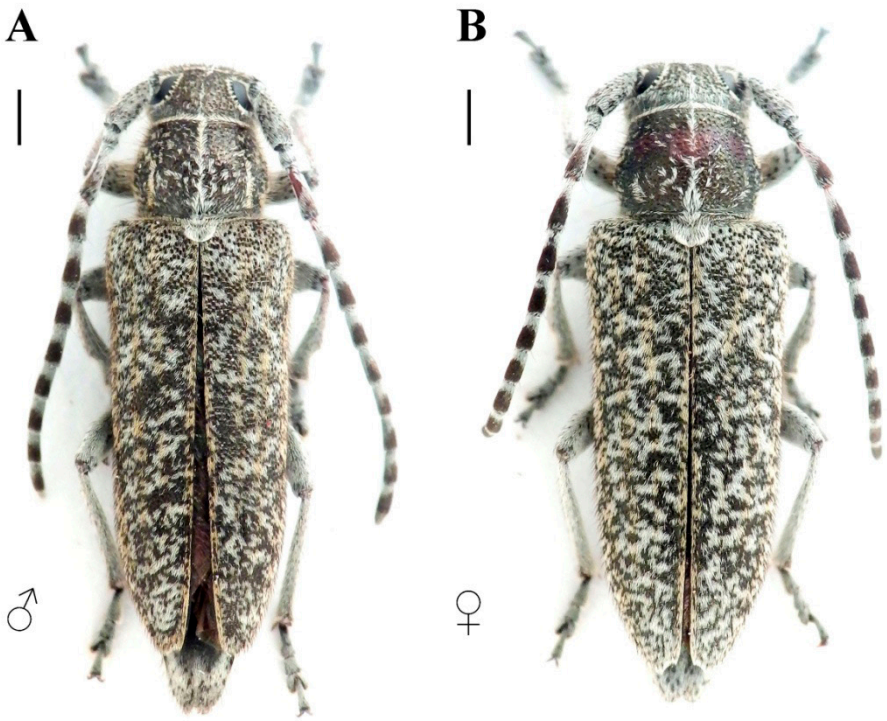

Fig. 3. *Phytoecia tigrina* (Mulsant, 1851) from Vtachanska Planina Mts. **A**: Male; **B**: Female; Scale bar: 1 mm.

Fig. 4. *Phytoecia tigrina* (Mulsant, 1851) in the natural environment of Vrachanska Planina Mts. **A**: Roadside verges under Milanovo Vill. with the host plant *Anchusa barrelieri* (All.); **B**: Female on the host plant; **C**: Mating individuals, 11.v.2017.

Saperdini Mulsant, 1839

***Saperda* (*Lopezcolonia*) *octopunctata* (Scopoli, 1772)**

Vratsa (Nedelkov 1905: 416, Kantardjiewa-Minkova 1934: 139); rev.: Vratsa (in Cyrillic), [without date], 1 ex., NN (NMNHS).

***Saperda* (*Lopezcolonia*) *scalaris scalaris* (Linnaeus, 1758)**

Vratsa (Nedelkov 1905: 415); rev.: Vratsa (in Cyrillic), [without date], 1 ex., NN (NMNHS).

Tetropini Portevin, 1927

****Tetrops praeustus praeustus* (Linnaeus, 1758)**

New data: VPM, Vrachanski Karst Reserve, Manastirski Dol area, VBP, GN08, 43°10.735'N 23°34.711'E, 510 m, 17.iv.2016, 1 ♀, sweeping, Ilia Gjonov leg. (BFUS).

Conclusions

A total of 73 taxa of Cerambycidae have been established on the studied region of Western Stara Planina Mts. From all listed taxa, localities of 49 are situated in Vrachanska Planina Mts. and those of 47 are within the territory of Vrachanski Balkan Natural Park. For Vrachanska Planina Mts., four of the species - *Prionus coriarius*, *Rosalia alpina alpina, Dorcadion axillare* and *Phytoecia tigrina* (as *Pilemia tigrina*), were reported in literature, the rest 44 taxa are new records for the study area. Twelve taxa are reported from Vrachanski Karst Reserve: *Anastrangalia dubia dubia*, *Rutpela maculata maculata*, *Stenurella melanura melanura*, *Clytus arietis arietis*, *Stenopterus rufus geniculatus*, *Agapanthia villosoviridescens*, *Dorcadion fulvum erythropterum*, *Dorcadion tauricum tauricum*, *Herophila tristis tristis*, *Morimus asper funereus*, *Phytoecia cylindrica* and *Tetrops praeustus praeustus*.

Despite the results of the present research, Cerambycidae species complex of Vrachanska Planina Mts. and the Park territory is still insufficiently studied. For comparison, 113 species of the family are known from Vitosha Mts. (Topalov *et al.* 2014), and 100 species have been reported from Belasitsa Mts. (Georgiev *et al.* 2013). The number of species, reported so far from Vrachanska Planina Mts., represents less than 50% of their actual number.

Two of the established species (*Phytoecia uncinata* and *Phytoecia tigrina*) are regarded as rare in Bulgaria. The taxa *Rosalia alpina alpina, Morimus asper funereus* and *Phytoecia tigrina* are included in the Annexes of the Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora. Therefore, even from the currently available data on the species composition of Cerambycidae from Vrachanska Planina Mts. it can be assumed that the studied area is of high conservation value for the group.

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Сечковци (Coleoptera: Cerambycidae) от Врачанска планина и Природен парк Врачански Балкан

ДЕНИС ГРАДИНАРОВ, ЯНА ПЕТРОВА

(Резюме)

Според публикувани и оригинални данни във Врачанската планина, територията на Природен парк Врачански Балкан и съседни райони на Западна Стара Планина са установени общо 73 таксона от семейство Cerambycidae. На територията на Врачанската планина са установени 49 таксона, а находищата на 47 от таксоните попадат в границите на Природен парк Врачански Балкан. Установен е нов вид за фауната на страната - *Vadonia hirsuta* (K. Daniel & J. Daniel, 1891). За вида *Phytoecia uncinata* (W. Redtenbacher, 1842) се съобщава второ находище в България. След повторно идентифициране на музеен материал е съобщено и ново находище на *Leiopus linnei* Wallin, Nylander & Kvamme, 2009. Три от установените видове – *Rosalia alpina* (Linnaeus, 1758), *Morimus asper funereus* Mulsant, 1863 и *Phytoecia tigrina* (Mulsant, 1851) са включени в Приложенията на Директива 92/43/ЕИО за опазване на естествените местообитания и на дивата флора и фауна. Установена е многочислена популация на *Ph. tigrina* на територията на Природен парк Врачански Балкан и е съобщено хранително растение на вида в България - *Anchusa barrelieri* (All.).

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Review of the hymenopteran fauna (Insecta: Hymenoptera) of the Vratchanska Planina Mountains with a checklist of species

Toshko Ljubomirov

Abstract. The diverse and large insect order Hymenoptera is reviewed in the borders of Vratchanska Planina Mountains regarding its species composition. Based upon twenty one publications and newly collected material of several families (Argidae, Thenthredinidae, Formicidae, Apidae among others) are established 185 species belonging to 24 hymenoptean families. On the basis of the general distribution and the biological characteristics of the families in the order, an assessment of their occurrence and number of species within the area is made; the existence of about 3880 hymenopteran species of 62 families at the area is predicted.

Key words: Insecta, Hymenoptera, faunistic review, Vratchanska Planina Mountains.

Introduction

The Hymenoptera is one of the most diverse and largest of all insect orders. Currently the group includes slightly more than 154000 described species. The actual species-richness can only really be estimated crudely since the myriads small species are poorly known; such a huge number of species is hardly to visualize but the size and diversity of the order presumably can be appreciated when one considers that it contains 132 families and just one of these, the Ichneumonidae, comprises more species than all the vertebrate groups combined. Vratchanska Planina Mountains is situated in north-west Bulgaria and occupies a small area of about 700 square kilometers; it is a part of the Stara Planina Mountains chain. The position of the mountain, the topography, the climate and the vegetational patterns (Bechev & Georgiev 2016) predispose the presence of rich and diverse fauna of Hymenoptera.

The present work summarizes the information concerning species composition and distribution of the order Hymenoptera of the Vratchanska Planina Mountains, including results of present field collecting. The first reports for Hymenoptera are found in the publication of Nedialkov (1914) where he quoted two species of andrenid and one species of halictid bees for the mountain; noteworthy labors subsequently are those of Atanassov (1972) and Gusenleitner & Schwarz (2002) with number of records of ants and bees for the region. Some species of different families are recorded sporadically for the mountain in the labors of indigenous or foreign researches between 1934 and 2016 (see Table 2). Published records from the area are not critically treated (except for some cases in the families Andrenidae, Colletidae, Crabronidae and Megachilidae), thus in certain cases (especially for the families of ants and bees) is possible to have incorrect information for

species identities.

Material and methods

The faunistic review is mainly based on published records which I sourced from the literature; however, no any electronic data bases were used. A number of locations (collection sites) for some species are far from being specific - e.g. “all Bulgaria”, “northern Bulgaria”, “western Bulgaria”, “anywhere in Bulgaria at altitudes up to 1000 m”, etc. The species covered with such locations are not considered as recorded for the mountain, thus they are not included in the list. Species recorded from populated places and areas that are apparently beyond the mountain range are omitted too – e.g., “Vratsa” (unless it is explicitly stated that the collecting site is south of Vratsa at altitude of 290 m or more), “Lakatnik”, “Cherepish”, “Cherepish – forest nursery”, “Cherepish – Monastery”, “Rebarkovo”; the latter four although in close proximity to the area are on the eastern side of the Iskar River thus are formally ouside the borders of Vratchanska Planina Mountains. Detailed data for collection sites of the mountain, with altitudes and geographic coordinates is presented in Table 1. New records were added from museum specimens in the following collections: The National Museum of Natural History, Sofia (NMNHS); The Institute of Biodiversity and Ecosystem Research, Sofia (IBER).

Table 1. Collection sites in Vratchanska Planina Mountains, with altitudes and geographic coordinates.

Localitiy name	Altitude (m)	Geographic coordinates
1. Borov Kamuk Peak, east	1100	43°09'04"N; 23°30'17"E
2. Borov Kamuk Peak, north-west	800	43°09’36“N; 23°29’43“E
3. Butov Dol, west	1060	43°12’02“N; 23°31’18“E
4. Elisseyna Village, vicinities	334	43°04’42“N; 23°29’29“E
5. Gara Lakatnik Village, north I	462	43°05’28“N; 23°22’11“E
6. Gara Lakatnik Village, north II	447	43°05’23“N; 23°22’12“E
7. Gara Lakatnik Village, north III	439	43°05’18“N; 23°22’15“E
8. Gara Lakatnik Village, north-west	470	43°05'21"N; 23°24'06"E
9. Ledenika Cave, surroundings, meadows	830	43°12’18“N; 23°29’38“E
10. Ledenika Chalet	920	43°12’12“N; 23°29’13“E
11. Ledenika Chalet, north	930	43°12'28"N; 23°29'06"E
12. Ledenika Chalet, south	1030	43°11'50"N; 23°29'26"E
13. Milanovo Village, Ruzhitsa, south I	486	43°05’47“N; 23°23’13“E
14. Milanovo Village, Ruzhitsa, south II	769	43°05’47“N; 23°23’24“E
15. Milanovo Village, Ruzhitsa, south III	523	43°05’50“N; 23°22’18“E
16. Milanovo Village, Ruzhitsa, south IV	764	43°05’40“N; 23°23’23“E
17. Milanovo Village, Ruzhitsa, south V	758	43°05'41"N; 23°23'18"E
18. Milanovo Village, Ruzhitsa, south VI	736	43°05'35"N; 23°23'14"E
19. Milanovo Village, Ruzhitsa, south-west I	755	43°05’39“N; 23°22’41“E
20. Milanovo Village, Ruzhitsa, south-west II	787	43°05’43“N; 23°22’32“E
21. Milanovo Village, Ruzhitsa, south-west III	738	43°05’40“N; 23°22’41“E
22. Milanovo Village, north	900	43°07'26"N; 23°23'32"E
23. Milanovo Village, south	610	43°05'30"N; 23°24'06"E

24. Milanovo Village, southeast	600	43°05'32"N; 23°24'07"E
25. Milanovo Village, surroundings	990	43°07'48"N; 23°23'19"E
26. Mine “Gerana”, remains, surroundings	1280	43°08’48“N; 23°24’37“E
27. Mine “Mir”, remains	1161	43°08'27"N 23°30'25"E
28. Okoltchitsa Peak	1050	43°09’13“N; 23°35’03“E
29. Opletnya Village	355	43°06’02“N; 23°26’44“E
30. Ossikovo Village (before 1950), surroundings	820	43°06’58“N; 23°23’45“E
31. Ossikovo Village (before 1950), vicinities above the Village	900	43°06’47“N; 23°24’11“E
32. Purshevitsa Chalet	1270	43°08’40“N; 23°28’37“E
33. Purshevitsa Chalet, north-east, meadows	1350	43°08’48“N; 23°27’49“E
34. Purshevitsa Peak, north	1380	43°09’00“N; 23°29’03“E
35. Ski-base building, surroundings	1040	43°10'47"N; 23°29'04"E
36. Sokolets Peak	1370	43°08’50“N; 23°23’48“E
37. Soldier-worker's spring	680	43°11’16“N; 23°30’18“E
38. Tchelopek Village, south-west	870	43°07’01“N; 23°35’05“E
39. Tchelopek Village, vicinities above the Village	1025	43°08’14“N; 23°35’29“E
40. Teacher's Vacation Station, meadows	1000	43°11’12“N; 23°28’54“E
41. Temnata Dupka Cave, north-west	566	43°05'23"N; 23°22'55"E
42. Temnata Dupka Cave, surroundings	490	43°05'22"N; 23°23'16"E
43. Vesstitel memorial	465	43°11'52"N; 23°33'06"E
44. Vesstitel memorial, surroundings, the second cliff	590	43°11’37“N; 23°32’56“E
45. Vilya Glava Peak, vicinities	1230	43°08’42“N; 23°25’12“E
46. Vratsata Pass	440	43°11’29“N; 23°31’53“E
47. Vurshets, east-meadows	380	43°12’40“N; 23°20’02“E
48. Zgorigrad Village	500	43°10’54“N; 23°30’52“E
49. Zgorigrad Village, south	560	43°10'27"N; 23°30'34"E
50. Zgorigrad Village, surroundings	460	43°11’27“N; 23°31’43“E
51. Zverino Village, surroundings	290	43°05’44“N; 23°34’37“E

Overview of the families and species composition of Hymenoptera in the Vratchanska Planina Mountains

Data available from the previous sources and field collecting yielded a total of 185 species of 24 hymenoptean families from 51 sites across the mountain (Table 1, Table 2). Down are listed the families of Hymenoptera established or expected to inhabit in Vratchanska Planina Mountains (62 in number); the presumable presence of the latter category at the area is based on their world and local (presence in Bulgaria) distribution as well as on their biological features indicated under each family in the text. Four families of the order, Blasticotomidae, Bradynobaenidae, Trigonalyidae and Xyelidae, are excluded in the list even though they are known from Bulgaria; considering their specific biological traits and the environmental conditions in Vratchanska Planina, it is concluded that species of these groups can not exist in the investigated area.

Suborder Symphyta

Superfamily Cephoidea Newman, 1834

Family Cephidae Newman, 1834

This is a small family of about 160 species mostly from Eurasia, and with about 20 species from Bulgaria. Members of the family have larvae feeding inside grass stems or twigs of woody plants. Cephidae are not known from the Vratchanska Planina Mountains so far; the area is supposed to house about five species.

Superfamily Orussoidea Newman, 1834

Family Orussidae Newman, 1834

Members of the small family of Orussidae (85 extant species) occur worldwide and due to the short adult stage in their life span they are rarely observed anywhere in their range. Orussidae are idiobiont ectoparasites of wood-boring beetle larvae (Buprestidae and Cerambycidae). Three species are recorded from Bulgaria so far, namely, *Orussus abietinus* (Scopoli, 1763), *Orussus unicolor* Latreille, 1812 and *Pseudoryssus henschii* (Mocsáry, 1910); all of them could be expected (but are not recorded up to now) to inhabit in Vratchanska Planina Mountains.

Superfamily Pamphilioidea Cameron, 1890

Family Megalodontesidae Konow, 1897

The family includes about 40 species and is restricted to the temperate regions of Eurasia. Their larvae feed on herbaceous plants. In Bulgaria Megalodontesidae are known with eleven recorded species. About a half of that number is expected to occur in Vratchanska Planina Mountains, where only one species is recorded so far (Atanassov 1972 - Table 2).

Family Pamphiliidae Cameron, 1890

The family embraces about 290 species occurring in the temperate and boreal areas of the Holartctic region. The larvae are leaf eaters, living in silky webs or in rolled leaves on bushes or trees. Fifteen species are known to inhabit in Bulgaria, ten of them being expected to be found in Vratchanska Planina Mountains, where no one species has been recorded so far.

Superfamily Siricoidea Billberg, 1820

Family Siricidae Billberg, 1820

The family embraces about 210 species with their native ranges restricted to the northern hemisphere. The larvae are wood borers, either on conifers or hardwood trees. Six species are known to occur in Bulgaria; in Vratchanska Planina Mountains are expected to be found three species of the genera *Tremex* and *Urocerus* with their larvae developing in hardwood trees; there is no record for any siricid from the area up to now.

Superfamily Tenthredinoidea Latreille, 1803

Family Argidae Konow, 1890

The second largest symphytan family with about 900 species worldwide and with most diversity found in tropical regions, Argidae involves sawflies which larvae feed externally on leaves or (by exception) are leaf miners. Argidae is represented in Bulgaria with about 20 species; ten of them are expected to be found in Vratchanska Planina Mountains; one species with two localities is newly recorded for the area (Table 2).

Family Cimbicidae W. Kirby, 1837

This cosmopolitan family includes about 180 species. The larvae are solitary leaf eaters on bushes and trees. Cimbicidae is represented in Bulgaria with about 30 species; ten of them are expected to be found in Vratchanska Planina Mountains; there are no records of the family from the area.

Family Diprionidae Rohwer, 1910

The family contains about 140 species restricted to the northern hemisphere. Diprionidae have their larvae feeding on conifers. The family is represented in Bulgaria with three species; at least two of them are expected to be found in Vratchanska Planina Mountains even though there are no records of the family for the area up to now.

Family Tenthredinidae Latreille, 1803

This is the largest sawfly family with about 5500 species, most of which occur in the northern hemisphere. There are about 330 described species recorded for Bulgaria; at least a half of them are expected to be found in Vratchanska Planina Mountains; three species are newly recorded for the area (Table 2).

Superfamily Xiphydrioidea Leach, 1819

Family Xiphydriidae Leach, 1819

Xiphydriidae is a small family, with about 150 species, which is widely distributed throughout the world except in sub-Saharan Africa. The larvae develop in dead or moribund branches of shrubs and small trees. There are three species represented in Bulgaria; all of them could be expected (but are not recorded up to now) to inhabit in Vratchanska Planina Mountains.

Suborder Apocrita

Superfamily Stephanoidea Leach, 1815

Family Stephanidae Leach, 1815

This family of about 380 species worldwide includes highly evolved parasitoids of large wood-boring Coleoptera. Stephaidae has two recorded species of two genera from Bulgaria, namely, *Megischus anomalipes* (A. Förster, 1855) and *Stephanus serrator* (Fabricius, 1798); both of them are expected to inhabit in Vratchanska Planina Mountains and the latter is newly recorded for the area (Table 2).

Superfamily Ceraphronoidea Haliday, 1833

Family Ceraphronidae Haliday, 1833

Ceraphronidae contains about 310 species around the world of small (body 1-3 mm long) wasps. They are primary endoparasitoids of Diptera, Lepidoptera, Thysanoptera and Neuroptera, and with some species hyperparasitoids of these host groups. About ten species are known to inhabit in Bulgaria, all of them being expected to be found in Vratchanska Planina Mountains, where no one species has been recorded so far.

Family Megaspilidae Ashmead, 1893

The family contains about 300 species around the world. They are primary endoparasitoids on host concealed in cocoons or puparia (of Diptera, Hemiptera, Mecoptera and Neuroptera), and in addition some species are hyperparasitoids. About ten species are known to inhabit in Bulgaria, all of them being expected to be found in Vratchanska Planina Mountains, where no one species has been recorded so far.

Superfamily Evanioidea Latreille, 1802

Family Aulacidae Shuckard, 1841

The Aulacidae comprises about 190 species distributed throughout the world with greatest species richness in tropical South America. They are endoparasitic koinobions of insects living in concealment in wood or twigs; hosts are wood-boring Coleoptera (Buprestidae, Cerambycidae) or Hymenoptera (Xiphydriidae). Five species are recorded from Bulgaria but their number is expected to be double. In Vratchanska Planina Mountains are expected about ten species; no one species has been recorded so far.

Family Evaniidae Latreille, 1802

Evaniids or ensign wasps are cosmopolitan and the family comprises about 450 species. They develop as predators of cockroach eggs within oothecae. Four species are recorded from Bulgaria so far; all of them could be expected to inhabit in Vratchanska Planina Mountains and one is newly recorded for the area (Table 2).

Family Gasteruptiidae Ashmead, 1900

Gasteruptiidae contains about 500 species around the world. Adult female gasteruptiid wasps oviposit in the nests of solitary bees and vespid wasps, where the larvae are predator-inquilines, eating the host egg or larvae and consuming the pollen store. Twelve species are recorded from Bulgaria so far; the same number is expected for the area Vratchanska Planina Mountains; seven species are newly recorded (Table 2).

Superfamily Mymarommatoidea Debauche, 1948

Family Mymarommatidae Debauche, 1948

Mymarommatidae contains 10 species around the world. Beside their small size they have unique feature, a pleated membrane that allows the head to expand and contract in an accordion-like manner. Nothing is known about their host associations. The family

is known with a single species in Bulgaria, namely *Palaeomymar anomalum* (Blood and Kryger, 1922); it is expected to inhabit in Vratchanska Planina Mountains, but was not recorded so far.

Superfamily Proctotrupoidea Latreille, 1802

Family Heloridae A. Förster, 1856

Heloridae contains twelve uncommon species around the world grouped in a single genus. They are are solitary endoparasitoids in larvae of Chrysopidae (Neuroptera). Two species are recorded from Bulgaria but their number is expected to be double. In Vratchanska Planina Mountains are expected four species; no one species has been recorded so far.

Family Proctotrupidae Latreille, 1802

Proctotrupidae contains 410 species around the world. Most species of Proctotrupidae are solitary endoparasitoids of Coleoptera larvae living in soil litter or rotten wood. About 25 species are recorded from Bulgaria but their number is expected to be more. In Vratchanska Planina Mountains are expected 20 species; no one species has been recorded so far.

Superfamily Diaprioidea Haliday, 1833

Family Diapriidae Haliday, 1833

Diapriids are cosmopolitan and the family comprises about 2050 species. The members of the family are primary endoparasitids of various Diptera. About 120 species are recorded from Bulgaria but their number is expected to be at least 780. About 500 species are expected to occur in Vratchanska Planina Mountains, where only one species is recorded so far (Petrov 1991 - Table 2).

Family Ismaridae Thomson, 1858

Ismaridae are distributed worldwide including only 34 species described. At least some develop as hyperparasitoids of Dryinidae (Hymenoptera). Four species are recorded from Bulgaria so far, namely, *Ismarus dorsiger* (Haliday, 1831); *Ismarus flavicornis* (Thomson, 1858), *Ismarus halidayi* A. Förster, 1850 and *Ismarus rugulosus* A. Förster, 1850; all of them could be expected (but are not recorded up to now) to inhabit in Vratchanska Planina Mountains.

Superfamily Platygastroidea Haliday, 1833

Family Platygastridae Haliday, 1833

Platygastridae are distributed worldwide including about 5400 species described. They are egg parasitoids of Orthoptera, Hemiptera and Diptera. About 75 species are recorded from Bulgaria but their number is expected to be more. In Vratchanska Planina Mountains are expected at least 150 species; nine species are recorded so far (Petrov 1991 - Table 2).

Superfamily Cynipoidea Latreille, 1802

Family Cynipidae Latreille, 1802

Cynipidae contains 1420 species described around the world. Members of the family either form galls on various plants or live as inquilines in the galls of the other gall-forming insects. About 50 species are recorded from Bulgaria. In Vratchanska Planina Mountains are expected 40 species; no one species has been recorded so far.

Family Figitidae Hartig, 1840

Figitidae contains 1570 species described around the world. Members of the family are endoparasitoids of Diptera or hyperparasitods of Aphididae (Hemiptera) trough Braconidae (Hymenoptera). About 30 species are recorded from Bulgaria. In Vratchanska Planina Mountains is expected the same number of species; no one species has been recorded so far.

Superfamily Chalcidoidea Latreille, 1817

Family Aphelinidae Thomson, 1876

Aphelinidae contains 1080 species described around the world. Members of the family are small in size ranging from 0.2 to 2.0 mm in body length. They are primary endoparasitoids or ectoparasitoids, or hyperparasitoids of Orthoptera, Hemiptera, Lepidoptera, Diptera and Hymenoptera. About 20 species are recorded from Bulgaria but their number is expected to be double. In Vratchanska Planina Mountains are expected 30 species; no one species has been recorded so far.

Family Azotidae Nikolskaya & Yasnosh, 1966

Azotidae contains 92 species described around the world with prevailing number of species in the Australian Region. They are hyperparasitoids of Hemiptera through Aphelinidae and Encyrtidae (Hymenoptera). One species is recorded from Bulgaria but their number is expected to be at least six. In Vratchanska Planina Mountains are expected five species; no one species has been recorded so far.

Family Chalcididae Latreille, 1817

Chalcididae are distributed worldwide including 1470 species described. Most chalcidids are primary larval and pupal endoparasitoids of various Coleoptera, Diptera, Lepidoptera, Hymenoptera and Neuroptera. Fifteen species are recorded from Bulgaria. In Vratchanska Planina Mountains are expected ten species; no one species has been recorded so far.

Family Encyrtidae Walker, 1837

Encyrtidae contains about 4060 species described around the world. They are endoparasitoids of various Coleoptera, Diptera, Lepidoptera, Hymenoptera, Neuroptera and Arachnida. About 150 species are recorded from Bulgaria. In Vratchanska Planina Mountains are expected 90 species; no one species has been recorded so far.

Family Eucharitidae Walker, 1846

Eucharitidae are distributed worldwide including about 430 species described. Members of the family are coenobiont ectoparasitoids on ants with highly movable first stage larva. Three species are recorded from Bulgaria so far but this number is far from being complete. In Vratchanska Planina Mountains are expected 15 species; no one species has been recorded so far.

Family Eulophidae Westwood, 1829

Eulophidae are distributed worldwide including about 4970 species described. Members of the family are ectoparasitoids on the egg, larvae and pupae of ten insect orders (mostly Coleoptera, Diptera, Hymenoptera and Lepidoptera), some are phytophagous or predaceous on Acari and Nematoda. About 270 species are recorded from Bulgaria. In Vratchanska Planina Mountains are expected to inhabit about 200 species; no one species has been recorded so far.

Family Eupelmidae Walker, 1833

Eulophidae are distributed worldwide including about 930 species described. Members of the family are ectoparasitoids of wood-boring Coleoptera, as well as hyperparasitoids of the egg and larval stages of various insect and spider hosts. The number of recorded species for Bulgaria is 33 being far from complete for the country. In Vratchanska Planina Mountains are expected to inhabit about 20 species; two species are known so far (Antov & Stojanova 2015 - Table 2).

Family Eurytomidae Walker, 1832

There are about 1460 species of Eurytomidae around the world. Many eurytomid species develop as solitary ecto- or endoparasitoids of phytophagous insects (e.g., gall formers) or they became secondarily phytophagous and develop as seed or stem borers. The number of recorded species for Bulgaria is 135 so far. In Vratchanska Planina Mountains are expected to inhabit about 100 species; no one species has been recorded so far.

Family Leucospidae Walker, 1834

Leucospidae contains about 130 species described around the world with prevailing number of species in tropics and subtropics. This is a rarely collected family, which includes parasitoids of solitary aculeate Hymenoptera, mostly bees. There are two species recorded for Bulgaria; both of them are expected to inhabit in Vratchanska Planina Mountains; one of them is previously reported (Atanassov 1972 - Table 2).

Family Mymaridae Haliday, 1833

There are 1440 described species of Mymaridae around the world. The member of the family are often rather small in size – body length less than 1.5 mm. Virtually all mymarids are egg parasitoids of numerous arthropod groups, with Coleoptera, Diptera, Hemiptera and Psocoptera being the most frequently utilized orders. The number of recorded species for Bulgaria is 55 so far. In Vratchanska Planina Mountains are expected to inhabit about 30 species; no one species has been recorded so far.

Family Ormyridae A. Förster, 1856

This sub-cosmopolitan family (absent in New Zealand) embraces 125 species. Ormyridae are mostly primary parasitoides or hyperparasitoids in galls of other insects, e.g., Cynipidae (Hymenoptera), Tephritidae (Diptera). The family is represented in Bulgaria by ten species. In Vratchanska Planina Mountains are expected to inhabit at least ten species; no one species has been recorded so far.

Family Perilampidae A. Förster, 1856

Perilampidae contains about 290 species described around the world. They are mostly hyperparasitoides of Lepidoptera through Tachinidae (Diptera) or Braconidae and Ichneumonidae (Hymenoptera). In this group the host-finding is done by the highly movable first instar larva. Only five species are known with quotations from Bulgaria. The expected number in Vratchanska Planina Mountains is also five; no one species has been recorded so far.

Family Pteromalidae Dalman, 1820

The morphologically extremely diverse family Pteromalidae embraces 3550 species around the world. The biology and host associations of pteromalids are extremely varied and some groups are even secondarily phytophagous. Most species are idiobiont ectoparasitoids and the hosts are concealed larvae and pupae of Lepidoptera, Diptera, Coleoptera and Hymenoptera; fig associated pteromalids are also known. Currently about 210 pteromalid species are known from Bulgaria. In Vratchanska Planina Mountains are expected to inhabit about 200 species; no one species has been recorded so far.

Family Signiphoridae Howard, 1894

This family includes about 80 species described and is most diverse in New World tropics. Members of the family are very small in size – less than 2 mm in length. Signiphorids are often reared from several Hemipteran families and may be primary or hyperparasitoids; pupae of Diptera and eggs of Lepidoptera are also attacked. One species is recorded from Bulgaria, namely *Thysanus ater* Walker, 1840, but their number is expected to be at least three. In Vratchanska Planina Mountains are expected three species; no one species has been recorded so far.

Family Tetracampidae A. Förster, 1856

This family includes about 45 species described around the world. Most Tetracampidae appear to be parasitoids of leaf-mining larvae or insect eggs of Coleoptera, Diptera and Hymenoptera. Only one species is recorded from Bulgaria, namely *Tetracampe impressa*. In Vratchanska Planina Mountains are expected seven species; no one species has been recorded so far.

Family Torymidae Walker, 1833

The family Torymidae embraces 900 species around the world. Many species of Torymidae are associated with plants, either parasitising hosts hidden within plant tissue or through secondarily developed phytophagy. Currently about 45 species of the family are known from Bulgaria. In Vratchanska Planina Mountains are expected to inhabit about 40 species; no one species has been recorded so far.

Family Trichogrammatidae Haliday, 1851

Trichogrammatidae contains about 880 species described around the world. Trichogrammatids are primary (solitary or gregarious) egg parasitoids; hosts are of Orthoptera, Thysanoptera, Hemiptera, Coleoptera, Diptera, Hymenoptera and Lepidoptera. The number of recorded species for Bulgaria is 26 so far. In Vratchanska Planina Mountains are expected to inhabit about 10 species; no one species has been recorded so far.

Superfamily Ichneumonoidea Latreille, 1802

Family Braconidae Nees von Esenbeck, 1811

The family Braconidae embraces 19200 species around the world. The majority of Braconidae are larval parasitoids but also oviposit into host eggs, pupae or adults. They develop as either primary endo- or ectoparasitoids on a wide variety of insect hosts. Braconids are known from about 800 species recorded for Bulgaria; however, their number is expected to be at least doubled. In Vratchanska Planina Mountains are expected to inhabit about 900 species; no one species has been recorded so far.

Family Ichneumonidae Latreille, 1802

This is the largest hymenopteran family with more than 24000 described species around the world. Biologically, Ichneumonidae are very diverse. They can be ecto- or endoparasitoids; parasitising the larvae, prepupae or pupae of various insects, and more rarely spiders and spider egg sacs. Some species are also hyperparasitoids. Ichneumonidae are known from 1916 species recorded for Bulgaria; however, their number is expected increase at least three times. In Vratchanska Planina Mountains are expected to inhabit about 1100 species; two species are known so far (Kolarov 2014 - Table 2).

Superfamily Chrysidoidea Latreille, 1802

Family Bethylidae Haliday, 1839

There are some 2340 species of bethylids worldwide and they are particularly abundant in the tropics. Bethylids are ectoparasitoids of larvae, and occasionally pupae, of Coleoptera, Hymenoptera and Lepidoptera. Nine species of the family are known from Bulgaria but their number is expected to surpass 50. In Vratchanska Planina Mountains are expected to inhabit about 40 species; no one species has been recorded so far.

Family Chrysididae Latreille, 1802

Chrysidid wasps include about 2500 species and occur in all regions except Antarctica. Chrysididae are parasitoids or cleptoparasitoids in the nests of solitary Crabronidae, Andrenidae, Halictidae, Megachilidae and Vespidae (Hymenoptera) as well as are parasitoids of insect eggs of Phasmatoptera. Ninety seven species of the family are known from Bulgaria but their number is expected to surpass 200. In Vratchanska Planina Mountains are expected to inhabit about 150 species; one species is newly recorded (Table 2).

Family Dryinidae Haliday, 1833

Drynidae is a cosmopolitan family including almost 1600 species. Drynids are ectoparasitoids of Fulgoridae (Hemiptera) – both of nymphs and adults. Females of the majority of species use their chelate fore legs to catch and hold their hosts while they sting and temporarily paralyze them. About 30 species of the family are known from Bulgaria but their number is expected to surpass 60. In Vratchanska Planina Mountains are expected to inhabit about 40 species; no one species has been recorded so far.

Family Embolemidae A. Förster, 1856

Embolemidae is a small family known from 39 species worldwide. Embolemids are koinobiont ectoparasitoids of the nymphs of Achilidae (Hemiptera) living under loose bark. One species is recorded from Bulgaria, namely *Embolemus ruddii*. In Vratchanska Planina Mountains is expected to inhabit the same species; no one species has been recorded so far.

Superfamily Vespoidea Latreille, 1802

Family Formicidae Latreille, 1802

Worldwide the Formicidae comprises roughly 12300 species. Ants are the only family of Hymenoptera where all species are eusocial; an exception is the social parasitism and cohabitation (parabiosis) in some species. About 200 species of the family are known from Bulgaria. In Vratchanska Planina Mountains are expected to inhabit about 100 species; 39 species are previously or newly recorded for the region (Atanassov 1934; Atanassov 1936; Atanassov & Vassileva 1976; Csősz *et al.* 2013; Csősz *et al.* 2015; Seifert & Csösz 2015; Antonova *et al.* 2016 - Table 2).

Family Mutillidae Latreille, 1802

About 4320 species of Mutillidae have been described around the world. Mutillids are ectoparasitoids and their females can be found on bare ground, sandy areas, tree trunks and walls where they search for nests of ground living Hymenoptera (e.g., Crabronidae, Megachlidae) or Coleoptera, whose larvae or pupae they parasitise. Thirty nine species of the family are known from Bulgaria but their number is expected to average 100. In Vratchanska Planina Mountains are expected to inhabit about 30 species; no one species has been recorded so far.

Family Pompilidae Latreille, 1804

Family Pompilidae embraces about 4900 described species around the world. Members of the family are predatory parasitoids, they use spiders as food for their developing larva; in exception thre are parasitoids of spider eggs. Fifty-six species of that group are known from Bulgaria; their number is expected to increase u to 270. In Vratchanska Planina Mountains are expected to inhabit about 130 species; eleven species are previously or newly recorded for the region (Wahis 2000 - Table 2).

Family Sapygidae Latreille, 1810

This sub-cosmopolitan family of vespoid wasps includes 66 extant species; it absent in Australian region. Larvae of Sapygidae are ectoparasitoids on the larvae of soil-nesting solitary vespid wasps or are cleptoparasites in the nest of bees (mainly of family

Megachilidae). Four species of the family are known from Bulgaria with expecting species number of six. In Vratchanska Planina Mountains are expected to inhabit about 5 species; no one species has been recorded so far.

Family Scoliidae Latreille, 1802

There are about 560 species of scoliid wasps worldwide. Female scoliids dig into soil or rotting wood where they search and paralyzes scarabaeoid or curculionid beetle larvae before depositing an egg; the scoliid develops ectoparasitically. Six species of the family are known from Bulgaria with expecting species number of fourteen. In Vratchanska Planina Mountains are expected to inhabit about seven species; one species is previously recorded for the region (Atanassov 1972 - Table 2).

Family Tiphiidae Leach, 1815

There are about 2000 species of tiphiid wasps worldwide. Tiphiidae are parasitoids of beetle larvae in soil. Six species of the family are recorded from Bulgaria so far; their number is expected to surpass 20. In Vratchanska Planina Mountains are expected to inhabit about ten species; no one species has been recorded so far.

Family Vespidae Latreille, 1802

Worldwide, there are about 4940 species of Vespidae. Vespids are solitary or social wasps; in solitary species the larva is usually predator on other insects, particularly Lepidoptera larvae, in a cell constructed and provisioned by the adult female wasp, in some cases the larva is supplied with a mixture of pollen and nectar instead; in social wasps the larva is progressively fed by adult females on masticated insects or rarely predominantly on glandular secretions. About 140 species of the family are known from Bulgaria. In Vratchanska Planina Mountains are expected to inhabit about 90 species; seven species are previously or newly recorded for the region (Atanassov 1942; Atanassov 1972 - Table 2).

Superfamily Apoidea Latreille, 1802

Family Ampulicidae Shuckard, 1840

The family Ampulicidae includes about 200 species distributed worldwide with greatest diversity in the tropics. They are are ectoparasitoids of adult and nymphal cockroaches. Two species are recorded from Bulgaria so far, namely, *Ampulex fasciata* Jurine, 1807 and *Dolichurus corniculus* (Spinola, 1807); both of them could be expected (but are not recorded up to now) to inhabit in Vratchanska Planina Mountains.

Family Andrenidae Latreille, 1802

Worldwide, there are about 2920 described species of Andrenidae. The andrenids are solitary; their nests are burrows in the soil; the larva is phytophagous developing on a diet of pollen and nectar collected and carried to the nest by the adult female. There are 159 species of Andrenidae recorded from Bulgaria. In Vratchanska Planina Mountains are expected to inhabit about 120 species; thirty species are previously or newly recorded for the region (Nedialkov 1914; Atanassov 1972, Gusenleitner & Schwarz 2002 - Table 2).

Family Apidae Latreille, 1802

The family Apidae includes about 5750 species spread around the world. The biology of the family is highly variable: from solitary to highly social behavior with dissimilar castes and from nest provisioners to social parasites and cleptoparasites; from mass provisioners to progressive provisioners of brood cells; from nest excavators in soil or in wood to forms that occupy preexisting cavities; the larva is always phytophagous. There are 264 species of Apidae recorded from Bulgaria. In Vratchanska Planina Mountains are expected to inhabit about 200 species; twenty two species are previously or newly recorded for the region (Atanassov 1962; Atanassov 1972, Rasmont *et al.* 2015 - Table 2).

Family Colletidae Lepeletier de Saint-Fargeau, 1841

The large, worldwide family Colletidae is most abundant in temperate parts of Australia and South America. Colletidae nest in dead hollow or pithy stems or in the ground. Larva feeds on liquid (nectar plus pollen) provisions provided by the adult female bee. There are 65 species of Colletidae known from Bulgaria at present. In Vratchanska Planina Mountains are expected to inhabit about 40 species; four species are previously or newly established for the region (Atanassov 1972 - Table 2). The colletid material reported by Atanassov (1972) as *Colletes pallescens* Noskiewicz, 1936 is misidentified; it belongs to two different species, *Colletes mlokossewiczi* Radoszkowski, 1891 and *Colletes succinctus* (Linnaeus, 1758).

Family Crabronidae Latreille, 1802

The large family Crabronidae embraces about 8800 species; crabronids have worldwide distribution but they are most abundant in semiarid areas of the tropics. The crabronid larvae develop by feeding on different arthropods provided for them by their female parent; nests are burrows in the ground, rotten wood or abandoned burrows of other insects; the females provisions each cell in the nest with multiple prey (paralyzed or dead). There are 316 species of Crabronidae known from Bulgaria at present. In Vratchanska Planina Mountains are expected to inhabit about 180 species; seventeen species are previously or newly established for the region (Atanassov 1972; Straka 2016 - Table 2). The crabronid material reported by Atanassov (1972) as *Cerceris dacica* Schletterer, 1887 is misidentified; it belongs to a different species, *Cerceris rybyensis* (Linnaeus, 1771).

Family Halictidae Thomson, 1869

The family Halictidae includes about 4330 species worldwide. Halictid nests are burrows in the soil or in rotting wood; majority of the species are solitary but some are communal or eusocial; the larva is phytophagous feeding of pollen and nectar. There are 136 species of Halictidae known from Bulgaria. In Vratchanska Planina Mountains are expected to inhabit about 120 species; thirteen species are previously or newly recorded for the region (Atanassov 1960; Atanassov 1972; Warncke 1992 - Table 2). The halictid material reported by Atanassov (1972) as *Halictus maculatus* F. Smith, 1848 from the meadows south of Vurshets is misidentified; it belongs to a different species, *Lasioglossum quadrinotatum* (W. Kirby, 1802).

Family Megachilidae Latreille, 1802

Megachilidae is a large worldwide family with about 4100 described species. Megachilids are nesters in pre-existing cavities such as burrows of beetles in wood or their nests consist of burrows in pithy stems or in soil; the larva is phytophagous feeding of pollen. There are 181 species of Megachilidae recorded from Bulgaria at present. In Vratchanska Planina Mountains are expected to inhabit about 90 species; eight species are previously or newly recorded for the region (Atanassov, 1960; Atanassov, 1972 - Table 2). The megachilid material reported by Atanassov (1972) as *Osmia dives* Mocsáry, 1877 from the meadows in higher part of the north half of Vratchanska Planina Mountains is misidentified; it belongs to a different species, *Osmia leaiana* (W. Kirby, 1802).

Family Melittidae Schenck, 1860

This family contains over 190 species around the world. The nests of Melittidae are borrows in the soil; the larva is phytophagous feeding of pollen which the adult female carries on the hind legs I a scopa limited to the tibia. There are sixteen species of Megachilidae recorded from Bulgaria at present. In Vratchanska Planina Mountains are expected to inhabit about 10 species; one species is previously recorded for the region (Atanassov 1972 - Table 2).

Family Sphecidae Latreille, 1802

The worldwide spread family Sphecidae embraces about 730 described species. The sphecid larvae develop by feeding on different insects provided for them by their female parent; nests are burrows in the ground or pre-existing cavities in wood or soil; the females provisions each cell in the nest with singular or multiple immobilized prey. There are 29 species of Sphecidae recorded from Bulgaria so far. In Vratchanska Planina Mountains are expected to inhabit about 13 species; two species are previously or newly recorded for the region (Atanassov 1972 - Table 2).

Table 2. Species composition and distribution of Hymenoptera in Vratchanska Planina Mountains.

Number in the collecting site column corresponds to the number in locality name column in Table 1; "**UL**" in the collecting site column denotes unspecified locality in the area; taxa marked by dagger (†) in the references column signify new records.

Taxa	Collecting sites	References
Family Megalodontesidae		
Megalodontes klugii (Leach, 1817)	40	Atanassov, 1972
Family Argidae		
Arge dimidiata (Fallén, 1808)	16, 21	†
Family Tenthredinidae		
Ardis pallipes (Audinet-Serville, 1823)	16	†
Athalia cordata Audinet-Serville, 1823	21	†
Periclista pupescens (Zaddach, 1859)	16	†
Family Stephanidae		
Stephanus serrator (Fabricius, 1798)	39	†
Family Gasteruptiidae		
Gasteruption diversipes (Abeille de Perrin, 1879)	38	†
Gasteruption erythrostomum (Dahlbom, 1831)	38	†
Gasteruption hastator (Fabricius, 1804)	38	†
Gasteruption jaclator (Linnaeus, 1758)	38	†
Gasteruption merceti Kieffer, 1904	38	†
Gasteruption opacum (Tournier, 1877)	38	†
Gasteruption paedemontanum (Tournier, 1877)	38, 39, 51	†
Family Diapriidae		
Trichopria oogaster (Thomson, 1858)	10	Petrov, 1991
Family Platygastridae		
Probaryconus spinosus (Kieffer, 1908)	10	Petrov, 2013
Trissolcus festivae (Viktorov, 1964)	28, 32	Petrov, 2013
Trimorus fimbriatus Kieffer, 1908	10	Petrov, 2013
Trimorus flavipes (Walker, 1836)	10	Petrov, 2013
Trimorus medon Walker, 1836	10, 32	Petrov, 2013
Trimorus therycides Walker, 1836	10	Petrov, 2013
Trissolcus flavipes (Thomson, 1860)	10, 32	Petrov, 2013
Trissolcus grandis (Thomson, 1860)	10, 32	Petrov, 2013
Trissolcus scutellaris (Thomson, 1860)	32	Petrov, 2013
Family Eupelmidae		
Eupelmus australiensis (Girault, 1913)	37	Antov & Stojanova, 2015
Eupelmus vesicularis (Retzius, 1783)	37	Antov & Stojanova, 2015

Family Leucospidae		
Leucospis dorsigera Fabricius, 1775	32, 40, 47	Atanassov, 1972
Family Ichneumonidae		
Exochus bolivari Seyrg, 1927	44	Kolarov, 2014
Exochus castaniventris Brauns, 1896	44	Kolarov, 2014
Family Chrysididae		
Hedychridium roseum (Rossi, 1790)	16	†
Family Formicidae		
Camponotus aethiops (Latreille, 1798)	9, 18, 21, 24	Atanassov, 1934; Antonova *et al.*, 2016; †
Camponotus fallax (Nylander, 1846)	15	†
Camponotus herculeanus (Linnaeus, 1758)	45	Atanassov, 1934
Camponotus piceus (Leach, 1825)	8, 22, 24	Antonova *et al.*, 2016
Camponotus truncatus (Spinola, 1808)	16	†
Camponotus vagus (Scopoli, 1763)	9, 21, 25	Atanassov, 1936; Antonova *et al.*, 2016; †
Crematogaster schmidti (Mayr, 1853)	6, 8, 15, 41	Antonova *et al.*, 2016; †
Dolichoderus quadripunctatus (Linnaeus, 1771)	7	†
Formica cinerea Mayr, 1853	15, 27	†
Formica gagates Latreille, 1798	5, 8	Antonova *et al.*, 2016; †
Formica pratensis Retzius, 1873	1, 11, 12, 16, 17, 20, 25, 48	Atanassov, 1936; Antonova *et al.*, 2016; †
Formica rufa Linnaeus, 1761	11, 12, 30, 35, 36, 48, 49	Atanassov, 1934; Antonova *et al.*, 2016
Formica sanguinea Latreille, 1798	26	Atanassov, 1934
Formicoxenus nitidulus (Nylander, 1846)	48	Atanassov, 1936
Lasius alienus (A. Förster, 1850)	15	†
Lasius brunneus (Latreille, 1798)	16	†
Lasius citrinus Emery, 1922	21	†
Lasius emarginatus (Olivier, 1792)	24	Antonova *et al.*, 2016
Lasius flavus (Fabricius, 1782)	30	Atanassov, 1934
Lasius fuliginosus (Latreille, 1798)	21	†
Lasius niger (Linnaeus, 1758)	7	†
Lasius psammophilus Seifert, 1992	22	Antonova *et al.*, 2016
Messor structor (Latreille, 1798)	8, 18, 30, 23, 46, 50	Atanassov, 1934; Atanassov, 1936; Atanassov & Vassileva, 1976; Antonova *et al.*, 2016; †
Myrmica rubra (Linnaeus, 1758)	42	Antonova *et al.*, 2016
Myrmica sulcinodis Nylander, 1846	31	Atanassov, 1936

Pheidole pallidula (Nylander, 1849)	8, 23, 41	Antonova *et al.,* 2016; †
Plagiolepis pygmaea (Latreille, 1798)	8, 24, 25	Antonova *et al.,* 2016
Plagiolepis taurica Santschi, 1920	41	†
Solenopsis fugax (Latreille, 1798)	23, 24, 25, 30	Atanassov, 1934; Antonova *et al.,* 2016
Tapinoma erraticum (Latreille, 1798) Antonova *et al.,* 2016	8	Antonova *et al.,* 2016
Temnothorax affinis (Mayr, 1855)	16	†
Temnothorax crasecundus Seifert & Csősz, 2015	39	Csősz *et al.,* 2015
Temnothorax crassispinus (Karavaiev, 1926)	39	Csősz *et al.,* 2015
Temnothorax kraussei (Emery, 1915)	16, 43	†
Temnothorax lichtensteini (Bondroit, 1918)	51	Csősz *et al.,* 2013; Csősz *et al.,* 2015
Temnothorax recedens (Nylander, 1856)	24	Antonova *et al.,* 2016
Temnothorax tergestinus (Finzi, 1928)	39	Csősz *et al.,* 2015
Temnothorax unifasciatus (Latreille, 1798)	16	
Tetramorium caespitum (Linnaeus, 1758)	27, 30	Atanassov, 1934; †
Family Pompilidae		
Agenioideus (*Agenioideus*) *nubecula* (A. Costa, 1874)	29	Wahis, 2000
Agenioideus (*Agenioideus*) *rytiphorus* (Kohl, 1886)	29	Wahis, 2000
Agenioideus (*Agenioideus*) *usurarius* (Tournier, 1889)	29	Wahis, 2000
Aporus (*Aporus*) *pollux* (Kohl, 1888)	29	Wahis, 2000
Arachnotheutes leucurus (F. Morawitz, 1891)	29	Wahis, 2000
Evagetes (*Evagetes*) *siculus* (Lepeletier de Saint-Fargeau, 1845)	29	Wahis, 2000
Poecilagenia rubricans (Lepeletier de Saint-Fargeau, 1845)	29	Wahis, 2000
Priocnemis (*Priocnemis*) *pogonioides* A. Costa, 1883	29	Wahis, 2000
Priocnemis (*Priocnemis*) *pusilla* (Schiødte, 1837)	29	Wahis, 2000
Priocnemis (*Umbripennis*) *hankoi* Móczár, 1944	21	†
Priocnemis (*Umbripennis*) *vulgaris* (Dufour, 1841)	21	†
Family Scoliidae		
Scolia (*Scolia*) *sexmaculata sexmaculata* (O. F. Müller, 1766)	47	Atanassov, 1972
Family Vespidae		
Ancistrocerus parietum (Linnaeus, 1758)	40	Atanassov, 1972
Dolichovespula norwegica (Fabricius, 1781)	30	Atanassov, 1942
Dolichovespula sylvestris (Scopoli, 1763)	30	Atanassov, 1942
Eumenes coarctatus coarctatus (Linnaeus, 1758)	47	Atanassov, 1972
Microdynerus parvulus (Heerrich-Schäffer, 1838)	16	†
Paravespula germanica (Fabricius, 1793)	30	Atanassov, 1942
Polistes (*Polistes*) *dominula* (Christ, 1791)	33	Atanassov, 1972
Polistes (*Polistes*) *nimpha* (Christ, 1791)	33, 40, 47	Atanassov, 1972

Family Andrenidae		
Andrena (*Andrena*) *helvola* (Linnaeus, 1758)	UL	Gusenleitner & Schwarz, 2002
Andrena (*Andrena*) *varians* (W. Kirby, 1802)	UL	Gusenleitner & Schwarz, 2002
Andrena (*Charitandrena*) *hattorfiana hattorfiana* (Fabricius, 1775)	40, UL	Atanassov, 1972; Gusenleitner & Schwarz, 2002
Andrena (*Chlorandrena*) *orientana* Warncke, 1965	UL	Gusenleitner & Schwarz, 2002
Andrena (*Chrysandrena*) *fulvago* (Christ, 1791)	UL	Gusenleitner & Schwarz, 2002
Andrena (*Cnemidandrena*) *nigriceps* (W. Kirby, 1802)	UL	Gusenleitner & Schwarz, 2002
Andrena (*Didonia*) *nasuta* Giraud, 1863	UL	Gusenleitner & Schwarz, 2002
Andrena (*Distandrena*) *distinguenda distinguenda* Schenck, 1871	UL	Gusenleitner & Schwarz, 2002
Andrena (*Euandrena*) *bicolor bicolor* Fabricius, 1775	UL	Gusenleitner & Schwarz, 2002
Andrena (*Euandrena*) *symphyti symphyti* Schmiedeknecht, 1883	UL	Gusenleitner & Schwarz, 2002
Andrena (*Holandrena*) *labialis* (W. Kirby, 1802)	47, UL	Atanassov, 1972; Gusenleitner & Schwarz, 2002
Andrena (*Lepidandrena*) *paucisquama* Noskiewicz, 1924	40, UL	Atanassov, 1972; Gusenleitner & Schwarz, 2002
Andrena (*Melandrena*) *thoracica melanoptera* Hedicke, 1934	UL	Gusenleitner & Schwarz, 2002
Andrena (*Micrandrena*) *minutula minutula* (W. Kirby, 1802)	UL	Gusenleitner & Schwarz, 2002
Andrena (*Notandrena*) *chrysosceles* (W. Kirby, 1802)	UL	Gusenleitner & Schwarz, 2002
Andrena (*Notandrena*) *nitidiscula nitidiuscula* Schenck, 1853	4, 47, UL	Nedialkov, 1914; Atanassov & Vasileva, 1990; Gusenleitner & Schwarz, 2002
Andrena (*Opandrena*) *schencki* F. Morawitz, 1866	UL	Gusenleitner & Schwarz, 2002
Andrena (*Parandrenella*) *figurata* F. Morawitz, 1866	UL	Gusenleitner & Schwarz, 2002
Andrena (*Plastandrena*) *bimaculata bimaculata* (W. Kirby, 1802)	UL	Gusenleitner & Schwarz, 2002
Andrena (*Poecilandrena*) *labiata labiata* Fabricius, 1781	UL	Gusenleitner & Schwarz, 2002
Andrena (*Poecilandrena*) *seminuda* Friese, 1896	40	Atanassov, 1972; Gusenleitner & Schwarz, 2002
Andrena (*Poliandrena*) *florea* Fabricius, 1793	40, UL	Atanassov, 1972; Gusenleitner & Schwarz, 2002

Andrena (*Poliandrena*) *limbata squamea* Giraud, 1863	UL	Gusenleitner & Schwarz, 2002
Andrena (*Simandrena*) *lepida* Schenck, 1861	UL	Gusenleitner & Schwarz, 2002
Andrena (*Taeniandrena*) *wilkella* (W. Kirby, 1802)	UL	Gusenleitner & Schwarz, 2002
Andrena (*Truncandrena*) *tscheki tscheki* F. Morawitz, 1872	UL	Gusenleitner & Schwarz, 2002
Andrena (*Zonandrena*) *chrysopyga* Schenck, 1853	21	†
Andrena (*Zonandrena*) *flavipes flavipes* Panzer, 1799	UL	Gusenleitner & Schwarz, 2002
Family Apidae		
Anthophora (*Heliophila*) *bimaculata* (Panzer, 1798)	33	Atanassov, 1972
Anthophora (*Lopanthophora*) *agama* Radoszkowski, 1869	40	Atanassov, 1972
Anthophora (*Pyganthophora*) *pedata* Eversmann, 1852	14, 21	†
Anthophora (*Pyganthophora*) *retusa* (Linnaeus, 1758)	40	Atanassov, 1972
Apis mellifera Linnaeus, 1758	33, 40, 47	Atanassov, 1972
Bombus (*Bombus*) *lucorum* (Linnaeus, 1761)	33, 40	Atanassov, 1972
Bombus (*Bombus*) *terrestris* (Linnaeus, 1758)	33, 40, UL	Atanassov, 1972; Rasmont *et al.*, 2015
Bombus (*Kallobombus*) *soroeensis* (Fabricius, 1777)	9, 22, 40, UL	Atanassov, 1972; Rasmont *et al.*, 2015
Bombus (*Megabombus*) *argillaceus* (Scopoli, 1763)	16, 19, 40, UL	Atanassov, 1972; Rasmont *et al.*, 2015; †
Bombus (*Megabombus*) *hortorum* (Linnaeus, 1761)	16, 19, 33, 40, UL	Atanassov, 1972; Rasmont *et al.*, 2015; †
Bombus (*Melanobombus*) *lapidarius* (Linnaeus, 1758)	16, 19, 33, 40, UL	Atanassov, 1972; Rasmont *et al.*, 2015; †
Bombus (*Psithyrus*) *barbutellus* (W. Kirby, 1802)	UL	Rasmont *et al.*, 2015
Bombus (*Psithyrus*) *vestalis* (Geoffroy, 1785)	UL	Rasmont *et al.*, 2015
Bombus (*Pyrobombus*) *pratorum* (Linnaeus, 1761)	16, 32, 40	Atanassov, 1972; †
Bombus (*Thoracobombus*) *humilis* Illiger, 1806	16, 33	Atanassov, 1972; †
Bombus (*Thoracobombus*) *pascuorum* (Scopoli, 1763)	33, 40, UL	Atanassov, 1972; Rasmont *et al.*, 2015
Bombus (*Thoracobombus*) *ruderarius* (O. F. Müller, 1776)	33, 40	Atanassov, 1972
Bombus (*Thoracobombus*) *sylvarum* (Linnaeus, 1761)	9, 16, UL	Atanassov, 1972; Rasmont *et al.*, 2015; †
Tetraloniella (*Tetraloniella*) *dentata* (Germar, 1839)	47	Atanassov, 1972
Eucera (*Eucera*) *nigrescens* Pérez, 1879	16, 40	Atanassov, 1972; †
Xylocopa (*Copoxyla*) *iris* (Christ, 1791)	30	Atanassov, 1962
Xylocopa (*Xylocopa*) *violacea* (Linnaeus, 1758)	9	Atanassov, 1972

Family Colletidae		
Colletes mlokossewiczi Radoszkowski, 1891 (nec *Colletes pallescens*: Atanassov, 1972: 193)	47	Atanassov, 1972
Colletes succinctus (Linnaeus, 1758) nec *Colletes pallescens*: Atanassov, 1972: 193)	47	Atanassov, 1972
Hylaeus (*Hylaeus*) *gracilicornis* (F. Morawitz, 1867)	14	†
Hylaeus (*Hylaeus*) *nigritus* (Fabricius, 1798)	47	Atanassov, 1972
Family Crabronidae		
Cerceris ruficornis ruficornis (Fabricius, 1793)	47	Atanassov, 1972
Cerceris rybyensis (Linnaeus, 1771) (nec *Cerceris dacica*: Atanassov, 1972: 191)	33, 47	Atanassov, 1972
Crabro (*Crabro*) *cribrarius* (Linnaeus, 1758)	33	Atanassov, 1972
Crossocerus (*Blepharipus*) *cetratus* (Shuckard, 1837)	7	†
Ectemnius (*Hypocrabro*) *continuus continuus* (Fabricius, 1804)	33	Atanassov, 1972
Ectemnius (*Hypocrabro*) *rubicola* (Dufour & Perris, 1840)	14	†
Harpactus affinis (Spinola, 1808)	38	†
Lestica (*Solenius*) *clypeata* (Schreber, 1759)	2, 16, 21, 40	Atanassov, 1972; †
Oxybelus trispinosus (Fabricius, 1787)	16	†
Tachysphex consocius Kohl, 1892	16	†
Tachysphex obscuripennis (Schenck, 1857)	16	†
Tachysphex pompiliformis (Panzer, 1803)	21	Straka, 2016; †
Tachysphex punctipleuris Straka, 2016	21	Straka, 2016
Tachytes obsoletus obsoletus (Rossi, 1792)	47	Atanassov, 1972
Trypoxylon (*Trypoxylon*) *beaumonti* Antropov, 1991	3	†
Trypoxylon (*Trypoxylon*) *clavicerum* Lepeletier de Saint-Fargeau & Audinet-Serville, 1828	3	†
Trypoxylon (*Trypoxylon*) *fronticorne* Gussakovskij, 1936	15	†
Family Halictidae		
Halictus (*Halictus*) *resurgens* Nurse, 1903	30	Atanassov, 1960
Halictus (*Halictus*) *rubicundus* (Christ, 1791)	33, 40	Atanassov, 1972
Halictus (*Halictus*) *scabiosae* (Rossi, 1790)	4	Nedialkov, 1914; Atanassov, 1960
Halictus (*Seladonia*) *subauratus* (Rossi, 1792)	47	Atanassov, 1972
Lasioglossum (*Dialictus*) *morio* (Fabricius, 1793)	30	Atanassov, 1960
Lasioglossum (*Evylaeus*) *crassepunctatum* (Blüthgen, 1923)	13	†
Lasioglossum (*Lasioglossum*) *quadrinotatum* (W. Kirby, 1802) (nec *Halictus maculatus*: Atanassov, 1972: 199)	47	Atanassov, 1972
Lasioglossum (*Lasioglossum*) *sexnotatum* (W. Kirby, 1802)	34	Atanassov, 1972
Lasioglossum (*Sphecodogastra*) *albipes* (Fabricius, 1781)	33, 40	Atanassov, 1972
Lasioglossum (*Sphecodogastra*) *laticeps* (Schenck, 1870)	47	Atanassov, 1972

Rophites (*Rophites*) *hartmanni* Friese, 1902	40	Atanassov, 1972
Sphecodes albilabris (Fabricius, 1793)	UL	Warncke, 1992
Sphecodes gibbus (Linnaeus, 1758)	40	Atanassov, 1972
Family Megachilidae		
Anthidium (*Anthidium*) *manicatum* (Linnaeus, 1758)	40	Atanassov, 1972
Osmia (*Allosmia*) *rufohirta rufohirta* Latreille, 1811	21	†
Osmia (*Helicosmia*) *aurulenta* (Panzer, 1799)	14, 21, 40	Atanassov, 1972; †
Osmia (*Helicosmia*) *caerulescens caerulescens* (Linnaeus, 1758)	21	†
Osmia (*Helicosmia*) *leaiana leaiana* (W. Kirby, 1802) (nec *Osmia dives*: Atanassov, 1972: 207)	40	Atanassov, 1972
Hoplosmia (*Odontanthocopa*) *bidentata bidentata* (F. Morawitz, 1876)	47	Atanassov, 1972
Megachile (*Eutricharaea*) *pilidens* Alfken, 1924	47	Atanassov, 1972
Pseudoanthidium (*Pseudoanthidium*) *nanum* (Mocsáry, 1879)	47	Atanassov, 1972
Family Melittidae		
Melitta (*Melitta*) *haemorrhoidalis* (Fabricius, 1775)	33	Atanassov, 1972
Family Sphecidae		
Ammophila sabulosa (Linnaeus, 1758)	13	†
Podalonia hirsuta hirsuta (Scopoli, 1763)	33	Atanassov, 1972

Comparing the established number of species with the presumed number of species in the area within each family I stated the degree of study of the relevant group at local level for the mountain (Table 3.). The degree of study expresses the ratio of the number of species found for the area to the number of expected species for the area; it is expressed as a percentage in the third column of Table 3.

Table 3. The degree of study of the species composition in order Hymenoptera by families for the Vratchanska Planina Mountains.

Family	Estimated number of species	Established number of species	Degree of study (%)
Cephidae	5	0	0
Orussidae	3	0	0
Megalodontesidae	5	1	20.0
Pamphiliidae	10	0	0
Siricidae	3	0	0
Argidae	30	1	3.3
Cimbicidae	20	0	0
Diprionidae	3	0	0
Tenthredinidae	120	3	2.5
Xiphydriidae	3	0	0
Stephanidae	2	1	50.0
Ceraphronidae	10	0	0
Megaspilidae	10	0	0
Aulacidae	10	0	0
Evaniidae	4	1	25.0
Gasteruptiidae	12	7	58.3
Mymarommatidae	1	0	0
Heloridae	4	0	0
Proctotrupidae	20	0	0
Diapriidae	500	1	0.2
Ismaridae	4	0	0
Platygastridae	150	9	6.0
Cynipidae	40	0	0
Figitidae	30	0	0
Aphelinidae	30	0	0
Azotidae	5	0	0
Chalcididae	10	0	0
Encyrtidae	90	0	0
Eucharitidae	15	0	0
Eulophidae	200	0	0
Eupelmidae	20	2	10.0
Eurytomidae	100	0	0
Leucospidae	2	1	50.0
Mymaridae	30	0	0
Ormyridae	10	0	0
Perilampidae	5	0	0
Pteromalidae	200	0	0
Signiphoridae	3	0	0
Tetracampidae	7	0	0
Torymidae	40	0	0
Trichogrammatidae	10	0	0
Braconidae	900	0	0
Ichneumonidae	1100	2	0.2
Bethylidae	40	0	0

Chrysididae	150	1	0.7
Dryinidae	40	0	0
Embolemidae	1	0	0
Formicidae	100	39	39.0
Mutillidae	30	0	0
Pompilidae	130	11	8.5
Sapygidae	5	0	0
Scoliidae	7	1	14.3
Tiphiidae	10	0	0
Vespidae	90	7	7.8
Ampulicidae	2	0	0
Andrenidae	120	30	25.0
Apidae	200	22	11.0
Colletidae	65	4	6.2
Crabronidae	180	17	9.4
Halictidae	120	13	10.8
Megachilidae	90	8	8.9
Melittidae	10	1	10.0
Sphecidae	13	2	15.4
Total	**5179**	**185**	**-**

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Преглед на фауната от ципокрили насекоми (Insecta: Hymenoptera) от Врачанската планина със списък на видовете

Тошко Любомиров

(Резюме)

Направен е преглед на разнообразния и богат на видове разред насекоми Hymenoptera в границите на Врачанска планина по отношение на неговия видов състав. На базата на двадесет и една публикации и новосъбрани материали от няколко семейства (сред които Argidae, Thenthredinidae, Formicidae, Apidae) са установени 185 вида, принадлежащи към 24 семейства Hymenoptera. Въз основа на общото пространение и биологичните характеристики на семействата от разреда е направена оценка на тяхното съществуване и брой на видовете в района; прогнозирано е съществуването на около 3880 вида ципокрили насекоми от 62 семейства в района.

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The Dipterans (Insecta: Diptera) of the Vrachanska Planina Mountains

ZDRAVKO HUBENOV

Abstract. A total of 680 two-winged species that belong to 45 families has been reported from the Vrachanska Planina Mts. Of them 625 species have been established in the Vrachanski Balkan Nature Park. The Mycetophilidae (138 species or 20.3%), Tachinidae (121 species or 17.8%) and Muscidae (48 species or 7.1%) are the most numerous and well studied. The greatest number of species has been found in the xerothermic oak forests belt (473 species or 69.5%) and in the Western part of the mountain (317 species or 46.6%). The established species belong to 78 areographical categories. The dipterous fauna can be divided into 2 main groups: 1) species with Mediterranean type of distribution (39 species or 5.7%) – more thermophilic and distributed mainly in the southern parts of the Palaearctic. Five species of southern type, distributed in the Palaearctic and beyond it, can be formally related to this group as well; 2) species with Palaearctic and Eurosiberian type of distribution (643 species or 94.5%) – more cold-resistant and widely distributed in the Palaearctic. Two hundred and nine species of northern type, distributed in the Palaearctic and beyond it, can be formally related to this group as well. The endemic species are 4 (0.6%). The distribution of the species according to the zoogeographical categories in the vegetation belts is considered. The Diptera fauna of the Vrachanska Planina Mts. is compared to this of the Vitosha, Rila and Pirin Mountains.

Key words: Diptera, Vrachanska Planina Mts., faunistic composition, zoogeography

Introduction

The first data on the dipterans of the Vrachanska Planina Mts. were reported by Nedelkov (1909, 1910, 1912). Between the two world wars the works of Konsuloff (1923), Buresch (1924), Enderlein (1924), Konsuloff & Paspalev (1925), Tschorbadjiew (1925, 1928, 1932, 1933), Drensky (1926, 1929, 1931, 1933, 1934, 1939a, 1939b, 1943), Czerny (1930), Szilády (1934), Zilahi (1934), Jacentkovský 1936, 1937 and Karaman (1939) appeared. After the World War II, many works about the Vrachanska Planina Mts. were published (Buresch *et al.* 1949; Drensky 1949; Lazarov 1949; Schmitz 1953; Drensky 1955, 1957, 1958; Buresch & Lazarov 1956; Popov 1956; Hůrka 1958, 1962; Popov & Nikolova 1958; Gregor & Povolny 1959; Makarov 1959; Naidenov 1962; Lavčiev 1964, 1965a, 1965b, 1970, 1980, 2003; Bankowska 1967; Božkov 1967, 1991; Popov 1968; Zhelyazova 1971; Zlatanov 1971; Beron 1972a; Beshovski 1972, 1985, 1998, 2004, 2008, 2009, 2013; Grigorov 1972; Lavchiev *et al.* 1977; Trenchev 1980; Krzemiński 1984; Nowosad *et al.* 1987; Krzemiński & Starý 1989; Skuhrava *et al.* 1991; Harizanov *et al.* 1996; Beshovski & Zatwarnicki 2000; 2001a, 2001b; Dzhambazov & Beschovsky 2000; Beschovsky & Dzhambazov 2002; Bechev

2009; Hubenov 2011; Nedelchev 2013). The hydrobiological (Valkanov 1941; Arndt 1943; Dimitrov 1963; Kovachev 1969; Russev *et al.* 1994; Stoichev 1994, 1996; Kenderov *et al.* 2012) and biospeleological (Gueorguiev & Beron 1962; Burghele-Balacesco 1966; Beron & Gurorguiev 1967; Hazelton 1970; Beron 1972b, 1994, 2006, 2015, 2016; Langourov 2001) studies have a faunistic contribution. Some of the faunistic data are reports that are not related to Vrachanska Planina Mts. and concern separated groups of dipterans. The data are mainly from the territories entering the popular tourist routes. It is better known the species composition along the Iskar Gorge, the surroundings of Gara Lakatnik Station, Vratsa and around the chalets Ledenika, Okolchitsa and Parshevitsa. There are more systematic studies on the families Culicidae (Božkov 1967), Muscidae (Lavčiev 1970) and Asilidae (Zhelyazova 1971). They are related to the complex studies of the Stara Planina (Balkan) Mts., conducted by the Institute of Zoology of the Bulgarian Academy of Sciences in the period 1960-1970. The most complete are the studies of Sciaroidea (=Mycetophiloidea) (Bechev 1985a, 1985b, 1986a, 1986b, 1988a, 1988b, 1989a, 1989b, 1990a, 1990b, 1990c, 1991a, 1991b, 1994, 1995, 1996, 1998, 1999, 2001, 2003, 2004, 2006a, 2006b, 2010), connected with the Ph.D. thesis of the Western Stara Planina (Balkan) Mts. In the management plan of the Vrachanski Balkan Nature Park, 504 Diptera species from 41 families are included (Hubenov 2011). Recently, all data about Mycetophiloidea (Bechev & Pavlova 2016) and Tabanidae (Ganeva 2016) are revised. Generalized studies on the Diptera fauna of the Vrachanski Balkan Mts. are lacking.

The aim of the work is to present the fauna, zoogeography and study on Diptera of the Vrachanski Balkan Nature Park and Vrachanska Planina Mts.

Investigated Region, Materials and Methods

The Vrachanska Planina Mts. is a part of the Western Stara Planina (Balkan) Mts. It is situated between the main chain of the Stara Planina Mts. and Predbalkan. The mountain is surrounded by the Varshets Basin (300-500 m a.s.l.), Vrachansko Pole Lowland (250-400 m a.s.l.), Mezdra Basin (150-350 m a.s.l.) and Iskar Gorge. The Druzhevska Col (863 m a.s.l.) connect it with the Koznitsa massif. The Vrachanska Planina Mts. stretches northwest-southeast and is 30 km long and 20 km wide. The maximum height at Beglichka Mogila Peak is 1482 m a.s.l. The average height of the mountain is 700 m a.s.l. and the lowest parts are at 150-200 m a.s.l. The valleys of the rivers Leva (Varteshnitsa), Cherna and Zlatitsa divide the mountain into three parts – West (Beglichki), North (Stresherski) and East (Bazovski), (Dinev & Mishev 1969; Minchev *et al.* 1980; Panayotov *et al.* 1989; Mutafov 2008; Nikolov *et al.* 2013). The Vrachanska Planina Mts. is composed of carbonate rocks. An open karst, rich in surface forms, has been developed. The water circulation has a considerable depth and has contributed to the formation of karst springs and cave systems (about 600 caves are known). The mountain is poor in waters. The specificity of the relief and waters creates over 160 waterfalls, most of which exist for 3-5 months. The Vrachanska Planina Mts. is drained by the rivers Ogosta, Botunya, Skat and Iskar. The mountain belongs to the Temperate-Continental climatic area and is included in the Sub-Mountain climatic region. According to the climatic vertical gradient, three climatic zones are outlined (Sabev, Stanev, 1959; Tichkov 1976, 1982; Velev 1990, 2002; Stanev 1991). The Vrachanska Planina Mts. belong to the Illyrian province of the European

deciduous forest area. The vegetation is differentiated in a system of three vegetation zones (Stojanov 1966; Velchev *et al.* 1982, 1989; Bondev 1991, 1997, 2002; Velchev 1997, 2002): 1) Xerothermic oak forests – up to 600-700 m a.s.l.; 2) Xeromesophylic and mesophylic mixed (oak-hornbeam) forests – from 600-700 m to 900-1000 m a.s.l.; 3) Beech forests – from 900-1000 m to 1500 m a.s.l. (fragmentary and poorly presented in the south hillsides). Often the first two belts are combined as oak forests (Velchev 1971). Under the human impact the natural boundaries between these belts are destroyed. The Vrachanska Planina Mts. belongs to the Stara Planina Zoogeographical Region and has an European and Eurosiberian faunistic character (Georgiev 1978, 1979, 1980, 1982, 1997, 2002). The mountain is rich in endemics, relicts and rare species.

The total area of the Vrachanski Balkan Nature Park is 288.0 km^2 (0.26% of the Bulgarian territory) with the reserve Vrachanski Karst also included (14.7 km^2). The mountain is a part of the European ecological network Natura 2000 – Vrachanski Balkan protected area, where 34 types of natural habitats are protected. The protected areas cover over 97% of the total area of the mountain.

The material from the Vrachanska Planina Mts. has been collected after 1900 and is collected from 54 localities (Table 1). The main part of it is stored in the National Museum of Natural History, the Institute of Biodiversity and Ecosystem Research and the scientific fund of the Department of Zoology of the Plovdiv University. All species, reported from the Vrachanska Planina Mts. are included. Many collectors did not give accurate localities and indicated only the Stara Planina Mts. or Western Stara Planina Mts. For a number of widespread and numerous species the authors did not give accurate localities on the labels and mentioned they occur everywhere. Such species are included in the review but it is not reported the part of the mountain in which they were found. A number of foreign entomologists have been published materials from Bulgaria, containing data about Vrachanska Planina Mts.

For each species are given: a recent scientific name; distribution on the territory of the Vrachanska Planina Mts.; altitude at which it is established; the vegetation belts it inhabits; parts of the mountain in which it was found (only if it is reported from the Vrachanska Planina Mts.); areographical characteristics and literary data (Table 3). The classification of the areas is based on the works of Kryzhanovsky (1965, 1976, 2002), De Lattin (1967), Malicky *et al.* (1983), Gorodkov (1984) and Vigna Taglianti *et al.* (1999)[1]. The areographical categorization of the species is based on the literary data and recent electronic issues. Zoogeographical analysis for the species categorization was used. This method allows obtaining data information about species complexes with different zoogeographical character based on the published data regarding species distribution and results of the faunistic research. These complexes contain zoogeographical information about the taxonomic groups which, combined with the origin of the ranges, determines the zoogeographical character of the fauna. The distribution of the species according to the zoogeographical categories is scrutinized. The Diptera fauna is compared to that of the Vitosha, Pirin and Rila Mountains (Tables 2, 4).

1 The inversion of the nomenclature of the ranges and the border between the West and East Palaearctic along the Ural Mts. of Vigna Taglianti *et al.* (1999) is not accepted. The traditional nomenclature and the border between the West and East Palaearctic along the Yenisey River was used.

Abbreviations used: ■ – species included in the management plan or found near the park; ▲ – mass species presented everywhere without exact locality; ▼– taxa with veterinary or human medical significance; ♣ – enemies for agriculture and forestry; ✳ – outdated data; **?** – possible category; **+++** – species, reported for the first time and localities, from which species are reported for the first time; ♦ –presence in the corresponding vegetation belt; ● – presence in the corresponding part of the mountain; **am** – Arctomontane, **atm** – Afrotropical-Mediterranean, **ba** – Boreoalpine, **ban** – Balkan-Anatolian, **bm** – Boreomontane, **cee** – Central and East European, **cse** – Central and South European, **csean** – Central and South European-Anatolian, **csee** – Central and Southeast European, **cseean** – Central and Southeast European-Anatolian, **cseei** – Central and Southeast European-Iranian, **cseeit** – Central and Southeast European-Iran-Turanian, **cseel** – Central and Southeast European-Lebanonian, **csei** – Central and South European-Iranian, **cseit** – Central and South European-Iran-Turanian, **csena** – Central and South European-North African, **cset** – Central (Middle) and South European-Turanian, **des** – Disjunct Eurosiberian, **dp** – Disjunct Palaearctic, **dpo** – Disjunct Palaearctic-Oriental, **e** – European, **ean** – European-Anatolian, **eanit** – European-Anatolian-Iran-Turanian, **eanna** – European-Anatolian-North African, **Eb** – Balkan endemic, **Ebg** – Bulgarian endemic, **Ebs** – Balkan subendemic, **eca** – European-Central Asian, **ee** – East European, **eeca** – East European-Central Asian, **ei** – European-Iranian, **eit** – European-Iran-Turanian, **em** – East Mediterranean, **ena** – European-North African, **Er** – Regional endemic, **esanca** – Eurosiberian-Anatolian-Central Asian, **esca** – Eurosiberian-Central Asian, **esit** – Eurosiberian-Iran-Turanian, **ess** – European and South Siberian, **eswa** – European-Southwest Asian, **et** – European-Turanian, **ewca** – European-West Central Asian, **h** – Holarctic, **h*** – species introduced in North America, **ha** – Holarctic-Australian, **hat** – Holarctic-Afrotropical, **hata** – Holarctic-Afrotropical-Australian, **hn** – Holarctic-Neotropical, **hna** – Holarctic-Neotropical-Australian, **hnat** – Holarctic-Neotropical-Afrotropical, **hno** – Holarctic-Neotropical-Oriental, **ho** – Holarctic-Oriental, **hoa** – Holarctic-Oriental-Australian, **hoes** – Holoeurosiberian, **hom** – Holomediterranean, **hop** – Holopalaearctic, **hpt** – Holarctic-Paleotropical, **hpta** – Holarctic-Paleotropical-Australian, **hptn** – Holarctic-Paleotropical-Neotropical, **i** – introduced species (immigrants), **k** – Cosmopolitan, **m** – montane, **mca** – Mediterranean-Central Asian, **mit** – Mediterranean-Iran-Turanian, **mm** – montane-Mediterranean, **mss** – Mediterranean and South Siberian, **msws** – Mediterranean and Southwest Siberian, **mt** – Mediterranean-Turanian, **mwca** – Mediterranean-West Central Asian, **nemit** – Northeast Mediterranean-Iran-Turanian, **nm** – North Mediterranean, **nmca** – North Mediterranean-Central Asian, **nmsfe** – North Mediterranean and South Far East, **nmt** – North Mediterranean-Turanian, **om** – Oriental-Mediterranean, **pa** – Palaearctic-Australian, **pat** – Palaearctic-Afrotropical, **pata** – Palaearctic-Afrotropical-Australian, **patn** – Palaearctic-Afrotropical-Neotropical, **po** – Palaearctic-Oriental, **poa** – Palaearctic-Oriental-Australian, **ppt** – Palaearctic-Paleotropical, **ppta** – Palaearctic-Paleotropical-Australian, **ptm** – Paleotropical-Mediterranean, **se** – South European, **see** – Southeast European, **seean** – Southeast European-Anatolian, **seena** – Southeast European-North African, **seess** – Southeast European and South Siberian, **sena** – South European-North African, **sess** – South European and South Siberian, **sk** – Semicosmopolitan, **sk*** – species introduced, **sp** – South Palaearctic, **spat** – South Palaearctic-Afrotropical, **spo** – South Palaearctic-Oriental, **sppt** – South Palaearctic-Paleotropical, **sppta** – South Palaearctic-Paleotropical-Australian, **tp** – Transpalaearctic, **wces** – West and Central Eurosiberian, **wcp** – West and Central Palaearctic, **wes** – West Eurosiberian, **wesan** – West Eurosiberian-Anatolian, **wesanca** – West Eurosiberian-Anatolian-Central Asian, **wesant** – West Eurosiberian-Anatolian-Turanian, **wesca** – West Eurosiberian-Central Asian, **wesit** – West Eurosiberian-Iran-Turanian, **west** – West

Eurosiberian-Turanian, **weswca** – West Eurosiberian-West Central Asian, **wp** – West Palaearctic, **wpat** – West Palaearctic-Afrotropical, **wpn** – West Palaearctic-Neotropical, **wpo** – West Palaearctic-Oriental.

Results and Discussion

A total of 680 dipteran species (17.0% of the species found in Bulgaria) belonging to 45 families have been established in the Vrachanska Planina Mts. so far (Tables 2 and 3). Of them 625 species have been reported from the Vrachanski Balkan Nature Park. The family Mycetophilidae (138 species or 20.3%) is the most numerous, followed by Tachinidae (121 species or 17.8%) and Muscidae (48 species or 7.1%). The remaining families contain from one to 44 species. The number of the established species of the Vrachanska Planina Mts. represents about 40-45% of the actual species composition of the mountain. The dipterans are a highly mobile group and after further studies of the Vrachanska Planina Mts. can be expected to reach about 1700-1800 species or 50-60% of the species composition of the most families found in the country. Of all 76 families known from the Vitosha, Rila and Pirin Mountains, 30 families are not established in the Vrachanska Planina Mts. (Table 2). At the same time, five of the families found in the Vrachanska Planina Mts., have not been established in the Vitosha, Rila or Pirin Mountains (Hesperinidae, Ditomyiidae, Dixidae, Vermileonidae and Nycteribiidae). A total of 81 families has been established in the four mountains [75.7% of the families of order Diptera (107 families), known from Bulgaria].

Only the family Mycetophilidae which had been a subject of Ph.D. thesis, is evenly distributed according to the vegetation belts and parts (Table 2). For the remaining families the taxa distribution is connected with the exploration of the corresponding mountain region and has no a systematic character. This is evident when comparing the established species with regard to localities (Table 1). Six areas of detailed research (over 50 species found) are outlined. First are the surroundings of Vratsa (146 species) and Parshevitsa Chalet (100 species) – the most visited places of the mountain. Regarding the other parts of the mountain, the surroundings of Gara Lakatnik Station, Ledenika Chalet, Matnitsa River and Iskar Gorge (from 44 to 72 species) are better studied. Of the inner parts of the mountain, the surroundings of the Ledenika Cave and Parshevitsa Chalet are better studied. Most species, known from these areas, are due to eight better studied families (Mycetophilidae, Cecidomyiidae, Ceratopogonidae, Tabanidae, Syrphidae, Chloropidae, Muscidae and Tachinidae). It is evident that the localities from which the most material is collected, are concentrated around the popular starting points for entering the Vrachanska Planina Mts. and the main tourist centers or routes. Of all 54 localities, a total of 17 (31.5%) localities are over 800 m a.s.l. The remaining localities are in the lower parts or in the periphery of the mountain (Table 1). It is seen, according to these data, that the territory of the Vrachanska Planina Mts. is unsufficiently explored.

The different parts of the mountain are differently studied (Table 2). The Western Part (317 species – 46.6%) is the best studied, followed by the Eastern Part (287 species – 42.2%). These parts (Beglichki and Bazovski) are also the most visited. The lowest number of species (except the families Mycetophilidae, Bolitophilidae, Keroplatidae, Chloropidae, Heleomyzidae and Ephydridae) has been found in the Northern (Stresherski) Part (191 species – 28.1%). The most families (27) are not reported from this part. In the well studied

family Mycetophilidae, the differences in the species composition of the parts are not big and the greatest number of species has been established in the Northern Part. In regard to the most Diptera families, the Northern Part of the Vrachanska Planina Mts. is poorly investigated. The data known from this part are from 17 localities (Table 1).

In comparison with the Central Balkan National Park [184 species (Hubenov *et al.*, 2000a)], East Rhodopes [279 species (Hubenov, 2004)], Pirin Mts. [742 species (Hubenov, 2015b)], Rila Mts. [1003 species (Hubenov, 2016)] and Vitosha Mts. [1272 species (Hubenov, 2018)], the dipteran fauna of the Vrachanska Planina Mts. is commensurable with the fauna of the Pirin Mts. The number of taxa recorded from the Vrachanska Planina Mts. exceeds the one of the Central Balkan and the East Rhodopes and significantly decreases vis-a-vis the Vitosha and Rila Mountains. It should be kept in mind that Vitosha and Rila Mountains are the most studied Bulgarian mountains while the Central Balkan and East Rhodopes are poorly investigated with respect to the two-winged insects. From the whole territory of the Stara Planina Mts. (insufficiently studied), about 700-800 species are reported. Regarding the dipterans, the Pirin Mts. is also poorly studied compared to the Rila and Vitosha Mountains. In the better studied families (Limoniidae, Simuliidae, Syrphidae, Chloropidae, Ephydridae, Muscidae and Tachinidae), the differences between the Vitosha, Rila and Pirin Mountains are not big. It is expected, under further investigations, the Pirin Mts. to exceed the most of the Bulgarian mountains in species composition of Diptera. This is related to the wide variety of natural habitats as well as the geographical location which the mountain occupies in Southwest Bulgaria (Hubenov 2015b).

In the xerothermic oak forests belt most species (473 species – 69.5%) have been established - a specific feature of the Vrachanska Planina Mts. with respect to the Vitosha, Rila and Pirin Mountains, where most species are found in the xeromesophilic and mesophilic mixed forests belt (Vitosha Mts.) and in the beech forests belt (Rila and Pirin Mountains) (Hubenov, 2015b, 2016, 2017). This is connected both with the open spaces to which species of the contiguous valleys penetrate and the great number of localities (43 – 79.6%) below 1000 m a.s.l. The lowest number of species (213 – 31.3%) has been established in the xeromesophilic and mesophilic mixed forests belt. This can be related to the scarce localities (13-24.1%) in the belt's characteristic height range and the human impact on the boundaries between the belts of the Vrachanska Planina Mts. For this reason, some authors combine the first two belts as an oak forests belt (Velchev 1971). In contrast to the Vrachanska Planina Mts. (where this belt is the second one), the Vitosha Mts. begins with the mesophilic and xeromesophilic mixed forests belt.

In the beech forests belt, 254 species (37.3%) have been found – less than the Vitosha, Pirin and Rila Mountains where the percentage varies from 46.6% (in Vitosha) to 73.4% (in Rila). Of the presented families, most species are found in the beech forests belt in the Mycetophilidae, Bolitophilidae, Scathophagidae, Anthomyiidae and Faniidae. The border between the beech and mixed forests of the Vrachanska Planina Mts. is unclear and depending on the exposure, relief and human impact, there are areas of fragmentation, mixing and replacement of beech forests with deforestation areas. The mentioned features and the scarce localities (12 – 22.2%) over 900 m a.s.l. determine the poor species richness in the beech forests belt of the Vrachanska Planina Mts. Regarding the hypsometric belts, the maximum number of species is recorded between 300 and 600 m a.s.l. (Table 3). In some cases, the finding of species at a certain altitude takes place accidentally. The lack of systematic research on Diptera of the Vrachanska Planina Mts., the unclear boundaries

among the vegetation belts and the fragmentary data for most families do not allow explicit conclusions about the adherence of the taxa to one or another vegetation zone to be made. The distribution of species in groups according to their presence in the vegetation belts has a relative character and depends on the specific features of taxa and research area, as well as on the duration of the research. There is a correlation between the horizontal and vertical distribution of Diptera. The species with wide vertical distribution usually comprise large areas of European, Eurosiberian, Palaearctic, Super-Palaearctic and Cosmopolitan type.

The zoogeographical categorization of the species (Table 3) is made on the basis of current data about their distribution. Thus, the dipterans are divided into 78 areographical categories, combined into two main groups and six subgroups (Table 4).

Species distributed in the Palaearctic and beyond it. This group (214 species – 31.5%) includes 27 categories, of which 23 combine species of northern type (widely distributed in the Holarctic and Palaearctic) and 4 – species of southern type (distributed only in the southern parts of the Palaearctic). The difference between the separate vegetation belts with respect to this group is from 1.6 to 6.4% (from 75 to 140 species). The difference between the xerothermic oak forests and the beech forests is greater, whereas in the mixed forests it does not exceed 5.9% (unlike the Rila and Pirin Mountains where the differences between the first four belts are minimal). It is very likely the establishment of other species of the group of northern type in the last 2 vegetation belts of the Vrachanska Planina Mts. owing to their distribution and insufficient studies of the higher parts of the mountain. It is accepted that the taxa of northern type have vast areas and ecological flexibility. In the Superpalaearctic complex (like the Vitosha, Rila and Pirin Mountains), the Holarctic species (98 species – 14.4%) prevail and from the other areographical categories, the Holarctic-Oriental (27 species – 4.0%) and the Palaearctic-Oriental forms (18 species – 2.6%) are better presented (Table 4). The species of the southern type are found only in the first vegetation belt. Usually the scrutinized areographical complex is scantly presented and is not determinant for the zoogeographical characteristic of taxa of the Bulgarian terrestrial fauna. In a highly mobile forms (such as Diptera) the complex is better presented and can exceed 25%. It is better presented in the Rila Mts. (25.7%) and the Pirin Mts. (21.0%) than the Vitosha Mts. (20.0%). In the two-winged insects significant numbers of synanthropic and synbovil forms with cosmopolitan distribution occur. They have anthropogenic areas, structured with the development of the human civilization (before the beginning of the contemporary research).

Species distributed only in the Palaearctic, but in more than one subregion (**Palaearctic type**). Taxa, whose areas include more than one Palaearctic subregion in latitudinal direction, belong to this group. They are well represented in the high mobile groups and comprise about 25-30% of the species composition. A total of 207 species (30.4%) from this group, combined into 21 areographical categories, has been established in the Vrachanska Planina Mts. (Table 4). Its character is determined by the Transpalaearctic (59 species – 8.7%), West Palaearctic (44 species – 6.5%), West and Central Palaearctic (20 species – 2.9%) and European-North African (19 species – 2.8%) species, which are the most numerous. The correlation of these categories (except the European-North African ones) remains the same in the separate vegetation belts of the Vrachanska Planina Mts. with small deviations, and ranges from 0.5% to 9.9% (one to 42 species). The Holopalaearctic and Eurosiberian-Central Asian species are well presented (10-16 species – 1.5-2.3%).

Eight species (1.2%) have a longitudinal disjunction of the areas with regard to Siberia and Central Asia (Tables 3 and 4). Probably some of these species are presented with sparse populations and will be studied in more details as a result of further research. Most often a latitudinal disjunction of the areas of this group lacks (Gorodkov 1984; Josifov 1988; Hubenov 2015a). A significant portion of the species with wide vertical distribution (about 25%) belong to this group. It includes from 21.5% to 35.1% (54 to 160 species) of the species composition in the separate vegetation belts (Table 4). The vast areas and wide vertical distribution of the taxa of this group are an indication of the greater ecological flexibility of its species. This group is poorly represented in the Vitosha, Rila and Pirin Mountains where it comprises from 23.8% to 27.5% of the known dipterans. This is probably related to the insufficient studies of the Vrachanska Planina Mts. Thus, owing to the lack of sufficient research and the non-systematic material collecting, more common and widespread species have been collected.

Species distributed within one subregion of the Palaearctic. This group (265 species – 39.0%) includes species with Eurosiberian (227 species – 33.4%) and Mediterranean (36 species – 5.3%) distribution (Tables 3 and 4). Endemics are included in this group as well. The Mediterranean-Central Asian species are also included here according to Kryzhanovsky (1965, 2002) and Lopatin (1989), who combine the Mediterranean and Central Asian subregions. The species with Mediterranean type of distribution are accepted in a general way and include Submediterranean, Subiranian and Pontian faunistic elements that could be considered separately from the Mediterranean ones (Gruev & Kusmanov 1994, 1999; Gruev 1995, Gruev & Bechev 2000).

The Eurosiberian species include 12 areographical categories, of which the European (88 species – 12.9%), Holoeurosiberian (36 species – 5.3%) and Disjunct Eurosiberian (35 species – 5.1%) taxa prevail. The ratio of these categories is different for the separate families (the Holoeurosiberian, Disjunct Eurosiberian and European species of the family Tachinidae are almost equal in number as the Eurosiberian forms are 50% in total, while in other families the Central and South European species are better represented). The number of taxa of these categories found in the separate vegetation belts varies from 3.8% до 14.3% (8-36 species) and increases (as a percentage) with height. The most Eurosiberian species (as a percentage) are found in the beech forests belt (38.6%) and predominate over the other zoogeographical categories. A number of disjunctive areas are presented – a longitudinal disjunction for parts of Siberia and Central Asia (Tables 3 and 4) and latitudinal disjunction with typical for the Eurosiberian complex boreomontane distribution (Gorodkov, 1984; Josifov, 1988; Hubenov, 2015a). Of interest is the significant presence of Eurosiberian species in the first vegetation belt of the Vrachanska Planina Mts., which can be explained in three ways: 1) It is possible a part of these species to have unclear Palaearctic distribution; 2) It is supposed that the humid mountain valleys characterized with cooler climate, have facilitated the migration of the above-mentioned forms to the lowlands. 3) predominant research of the lower parts of the mountain compared to the higher ones. Finding of the Eurosiberian boreomontane forms at low altitudes has also been reported for other insect groups as Heteroptera, Cerambycidae (Coleoptera) and Tachinidae (Diptera) by Josifov 1963, 1976; Georgiev & Hubenov 2006; Hubenov 1992, 2008b. For Cerambycide this fact is due to the large afforestations of conifers in the first two vegetation belts. Probably because of this reason, many boreomontane and montane species that feed on conifers, go down below 1000 m a.s.l. There is a difference among the

Vitosha, Rila and Pirin Mountains with respect to the Eurosiberian species which are more (42.8-51.5%) than in the Vrachanska Planina Mts.

The Mediterranean species, combined into 15 zoogeographical categories, are presented mainly in the first vegetation belt and their number rapidly decreases with altitude. Because of the big variety of these areas, the group is divided into many subgroups with different origin, distribution and ecological peculiarities of the taxa. This complexity contributes to establishing of various zoogeographical classifications for Bulgaria (Josifov, 1981, 1986, 1988, 1999; Gruev 1988, 1995, 2000a, 2000b, 2000c, 2002; Heiss & Josifov 1990; Gruev & Kusmanov 1994; Hubenov 1996, 2008a; Gruev & Bechev 2000; Popov 2002). The Mediterranean species, established in one or two vegetation belts, prevail (Table 3). A significant percentage of these species and their relatively scarce populations are due to the lower ecological flexibility of the Mediterranean forms in comparison with the previous ones. The Mediterranean species include from 2.0 to 6.1% (5 to 28 species) of Diptera of the separate vegetation belts in the Vrachanska Planina Mts. (Table 4). The Holomediterranean (9 species – 1.3%) and Mediterranean-Iran-Turanian (4 species – 0.6%) species are the most numerous. When comparing with the Vitosha, Rila and Pirin Mountains, there is a higher percentage (3.6-4.5-5.5%) of the Mediterranean taxa southwards which does not apply to the Vrachanska Planina Mts. (5.3%). This is related to the specific natural conditions of the mountain – karst terrain, xerothermic habitats and lower altitudes. There is some difference in the distribution of the main areographical categories in the Mediterranean species compared to the Vitosha, Rila and Pirin Mountains – the Mediterranean-Central Asian, Holomediterranean, North Mediterranean and South European species prevail.

Endemics. This category includes taxa, which are not distributed outside the Balkan Peninsula. The percentage of endemism is low in Diptera (4 species – 0.6%). The regional endemic forms prevail (2 species – 0.3%). Endemics have been found in the xerothermic and beech forests belts (2 species in each one, 0.4-0.8%). Endemic forms have not been established in the mixed forests belt. It is possible these endemic species to be accepted as postglacial neoendemics (at any rate these in the beech forests belt) which are to be connected with the Eurosiberian forms. The endemic dipterans are rare and are mostly newly described taxa – 3 species from 1985 to 1989, one subendemic in 1859 (Table 3).

Conclusion

A total of 680 two-winged species (17.0% of the species found in Bulgaria) that belong to 45 families have been reported from the Vrachanska Planina Mts. The dipterous fauna can be divided into 2 main groups: 1) species with Mediterranean type of distribution (39 species or 5.7%) – more thermophilic and distributed mainly in the southern parts of the Palaearctic. Five species of southern type, distributed in the Palaearctic and beyond it, can be formally related to this group as well; 2) species with Palaearctic and Eurosiberian type of distribution (643 species or 94.5%) – more cold-resistant and widely distributed in the Palaearctic. Two hundred and nine species of northern type, distributed in the Palaearctic and beyond it, can be formally related to this group as well. The zoogeographical character of the Tachinidae fauna is determined by the second group. The correlation of the two groups is different in the separate vegetation belts (Table 4). The endemic species are 4

(0.6%). The percentage of the typical Mediterranean species of the Vitosha, Rila and Pirin Mountains is close and increases from north to south (3.6-4.5-5.5%, respectively) which does not apply to the Vrachanska Planina Mts. (5.3%). The variety of the areographical categories decreases with altitude.

Xerothermic oak forests – 473 species (69.5%) of 72 areographical categories. From the species with Mediterranean type of distribution (33 species or 7.0%) the Holomediterranean, Mediterranean-Iran-Turanian, Mediterranean-Central Asian, Central and South European-Iranian, North Mediterranean and Southeast European-Anatolian species are most numerous, and from the species with Palaearctic and Eurosiberian type of distribution (421 species or 89.0%) – the Holarctic, Transpalaearctic, Holoeurosiberian, Disjunct Eurosiberian and European species are best represented. One Balkan subendemic and one regional endemic have been established.

Xeromesophyllic and mesophyllic mixed forests – 211 species (31.0%) of 43 areographical categories. From the species with Mediterranean type of distribution (6 species or 2.8%) the Holomediterranean species prevail, and from the species with Palaearctic and Eurosiberian type of distribution (205 species or 97.2%) – the Holarctic, Transpalaearctic and European species are best represented. The number of the West and Central Palaearctic, West Palaearctic, Holoeurosiberian and Disjunct Eurosiberian species is increased. The species of southern type distributed in the Palaearctic and beyond it are not presented. Endemic forms have not been established yet.

Beech forests – 251 species (36.9%) of 47 areographical categories. From the species with Mediterranean type of distribution (5 species or 2.0%) the Mediterranean-Iran-Turanian, Central and South European-Iranian, Central and Southeast European-Iranian, North Mediterranean and Southeast European-Anatolian species are presented with one species each, and from the species with Palaearctic and Eurosiberian type of distribution (244 species or 97.2%) the Holopalaearctic, Transpalaearctic, Holoeurosiberian, Disjunct Eurosiberian and European species prevail. The species of southern type distributed in the Palaearctic and beyond it are not presented. The number of the Holarctic-Oriental, Cosmopolitan and West and Central Eurosiberian species is increased. One Balkan and one regional endemic forms have been found. The percentage of the Mediterranean forms decreases.

Table 1. Localities of Diptera from the Vrachanska Planina Mts. and the surroundings.

Note. ■ – localities near the Vrachanski Balkan Nature Park.

Localities	Altitude (m)	GPS Navigation (°N, °E)	UTM Kode	Number of species
1. Beli Izvor Village (above the village)	350	43°15'50.32"; 23°26'31.66"	FN99	3
2. Bistrets Monastery of St. Ivan Pusti, surroundings	510-570	43°14'37.60"; 23°27'46.71"	GN08	6
3. Borov Kamak Waterfall, area Leva Reka River	700-850	43°09'26.16"; 23°30'23.01"	GN08	10
4. Butov Dol (near Vratsa Town)	400	43°12'26.80"; 23°31'52.06"	GN08	16
5. ■ Byalata Voda Chalet (near Varshets Town)	770-780	43°09'08.10"; 23°18'18.28"	FN88	10
6. Chavkite Cave (near Milanovo Village)	1341	43°80'55.35"; 23°23'52.83"	FN97	2
7. Cherepish Monastery, surroundings	260-270	43°05'38.73"; 23°36'54.33"	GN17	22
8. Complex of NPP „Kozloduy", surroundings	1059	43°10'34.41"; 23°28'32.61"	GN08	7
9. Dolna Byala Rechka Village (above the village)	390-440	43°11'29.01"; 23°20'44.43"	FN98	2
10. ■ Druzhevo Village (above the village)	900	43°08'39.56"; 23°21'30.47"	FN98	5
11. Druzhevo 2 Village (near the village)	815	43°08'43.18"; 23°22'34.08"	FN98	4
12. Eliseyna Village (near the village)	320	43°04'23.15"; 23°28'22.38"	GN07	11
13. ■ Gara Bov Station, surroundings	650	43°01'31.59"; 23°20'16.58"	FN96	18
14. Gara Lakatnik Station, surroundings	380	43°04'51.10"; 23°22'29.08"	FN97	56
15. Golemata Mecha Dupka Cave (near Vratsa Town)	≈1000	43°11'52.69"; 23°29'49.19"	FN97	4
16. Golemata Vrazha Dupka Cave (near Lakatnik)	500	43°05'18.49"; 23°22'20.49"	FN97	2
17. Gorna Byala Rechka Village (above the village)	800	43°11'25.88"; 23°21'47.98"	FN98	14
18. Gorski Dom Chalet (near the chalet)	1221	43°09'28.73"; 23°28'30.04"	GN08	1
19. Hotel Hushove (near Vratsa Town), surroundings	400-430	43°10'44.63"; 23°35'33.81"	GN18	12
20. Iskar gorge, near Iskar River (Iskar Valley)	230-460		FN96-GN17	44
21. Kiparis Hotel, near the road to the Parshevitsa Hut	1100	43°10'22.15"; 23°29'10.31"	GN08	11
22. Ledenika 1 Cave (near Vratsa Town)	850	43°12'16.45"; 23°29'36.88"	GN08	8
23. Ledenika 2 Cave, surroundings	830-840	43°12'18.32"; 23°29'37.23"	GN08	5
24. Ledenika 3 Chalet, surroundings	800-880	43°12'17.38"; 23°29'22.87"	GN08	54
25. Ledenika 4 Chalet, near the road	987	43°10'57.86"; 23°29'13.63"	GN08	8
26. Levishte Village, surroundings	500	43°05'27.88"; 23°28'15.65"	GN07	20

Table 1. Continued

Localities	Altitude (m)	GPS Navigation (°N, °E)	UTM Kode	Number of species
27. Malkata Mecha Dupka Cave (near Vratsa Town)	≈1000	43°11'53.73"; 23°29'52.36"	FN97	5
28. Matnitsa Monastery, near Matnitsa River	218	43°16'30.46"; 23°23'34.78"	FN99	8
29. Matnitsa River, area	250-350	43°15'54.99"; 23°20'50.86"	FN99	72
30. Medenik Cave (mines at Eliseyna Village)	400-600	43°06'06.24"; 23°29'27.33"	GN07	3
31. Milanovo Village, surroundings	770-780	43°05'59.20"; 23°23'25.90"	FN97	33
32. Monument near Milanovo Village, surroundings	665-690	43°05'27.54"; 23°23'06.58"	FN97	8
33. Ochin Dol Village, surroundings	550-600	43°15'54.99"; 23°20'50.86"	GN07	14
34. Okolchitsa Peak, surroundings	1114	43°09'05.96"; 23°34'51.15"	GN08	15
35. Parshevitsa Chalet, surroundings	1250-1280	43°08'40.41"; 23°28'36.49"	GN08	100
36. Parshevitsa 2 Chalet, north of the chalet	1234	43°09'04.59"; 23°28'30.47"	GN08	6
37. Petrinski Dol River (near Milanovo Village)	524	43°06'16.94"; 23°22'24.76"	FN97	17
38. Razhishkata (Suhata) Peshtera Cave (at Lakatnik)	577	43°05'24.28"; 23°23'06.79"	FN97	8
39. ■ Rebarkovo Village, surroundings	220-250	43°06'58.13"; 23°40'32.69"	GN27	9
40. Reznyovete Cave (near Vratsa Town)	950-1000	43°12'16.99"; 23°29'32.63"	GN08	8
41. Studenata (Cherepishkata) Cave (near Iskar River)	265	43°05'37.55"; 23°37'10.78"	GN17	1
42. Temnata Dupka Cave (at Lakatnik)	445	43°05'20.11"; 23°23'05.42"	FN97	10
43. Temnata Dupka 2 Cave, surroundings	445-500	43°05'20.11"; 23°23'05.42"	FN97	1
44. Vratsa district			FN99-GN17	70
45. Vratsa Town, surroundings	350-370	43°12'14.73"; 23°32'43.03"	GN08	146
46. Vrattsata gorge, surroundings (near Vratsa Town)	450	43°11'25.49"; 23°31'48.27"	GN08	9
47. ■ Varshets Town, Western Stara Planina Mts.	382-447	43°11'42.58"; 23°17'23.85"	FN88	22
48. ■ Western Stara Planina Mts.			FN78-GN17	20
49. Yavoretska Peshtera Cave (near Lakatnik)	1212	43°07'40.04"; 23°34'06.88"	GN07	3
50. Zgorigrad Village (above the village) near Vratsa	450-650	43°11'02.60"; 23°30'17.89"	GN08	31
51. Zgorigrad 2 Village (above the village) near Vratsa	631	43°11'25.06"; 23°30'29.27"	GN08	3
52. Zhitolyub – karst spring (near the spring)	392	43°05'18.14"; 23°22'59.79"	FN97	1
53. Zidanka Cave (at Lakatnik), surroundings	490	43°05'21.51"; 23°23'04.27"	FN97	1
54. Zmeyova Dupka Cave (at Bistrets neighborhood)	900	43°13'39.14"; 23°28'26.97"	GN08	1

Table 2. Dipterans (Insecta: Diptera) of the Vrachanska Planina, Vitosha, Rila and Pirin Mountains.

Families	Species of the Vrachanska Planina Mts.								Species of the Vitosha Mts.		Species of the Rila Mts.		Species of the Pirin Mts.	
	Belts			Parts			Total number							
	Xerothermic	Mixed	Beech	Western	Northern	Eastern	number	%	number	%	number	%	number	%
NEMATOCERA	204	62	118	154	111	125	**307**	**45.1**	314	24.72	294	29.31	200	26.35
Tipulidae	5			2		4	**7**	**1.0**	12	0.94	9	0.90		
Limoniidae	28	1		27	1	6	**32**	**4.7**	49	3.86	62	6.18	84	11.06
Pediciidae									6	0.47	13	1.30	9	1.18
Blephariceridae									6	0.47	2	0.20		
Bibionidae						1	**1**	**0.1**			4	0.40		
Hesperinidae			1	1			**1**	**0.1**						
Mycetophilidae	77	30	99	72	95	50	**138**	**20.3**	1	0.08	14	1.40	15	1.98
Ditomyiidae	1		1	1	1	1	**1**	**0.1**						
Bolitophilidae	1	1	3	3	2	1	**4**	**0.6**			4	0.40	5	0.66
Diadocidiidae	1		1	1	1		**1**	**0.1**			1	0.10	1	0.13
Keroplatidae	21	4	6	6	11	18	**26**	**3.8**			7	0.70	7	0.92
Sciaridae	1						**1**	**0.1**	41	3.22	4	0.40		
Cecidomyiidae	22	20	1	19		10	**44**	**6.5**	138	10.87	65	6.48	54	7.11
Psychodidae									2	0.16				
Trichoceridae									1	0.08	1	0.10		
Scatopsidae											1	0.10		
Ptychopteridae		1					**1**	**0.1**			1	0.10	1	0.13
Dixidae	1			1			**1**	**0.1**						
Culicidae	5	5	5	3			**6**	**0.9**	10	0.79	9	0.90		

Table 2. Continued

Families	Species of the Vrachanska Planina Mts.								Species of the Vitosha Mts.		Species of the Rila Mts.		Species of the Pirin Mts.	
	Belts			Parts			Total number							
	Xerothermic	Mixed	Beech	Western	Northern	Eastern	number	%	number	%	number	%	number	%
Thaumaleidae									1	0.08				
Simuliidae	7		1	4		2	**8**	**1.2**	35	2.76	37	3.69	10	1.32
Ceratopogonidae	20					20	**20**	**2.9**	4	0.31	6	0.60	1	0.13
Chironomidae	14			14		12	**15**	**2.2**	8	0.63	53	5.28	13	1.71
ORTHORRHAPHA	47	7	14	31	7	35	**61**	**9.0**	125	9.84	108	10.77	53	6.98
Coenomyiidae											1	0.10		
Xylophagidae									1	0.08				
Stratiomyidae	5		1	4	1	4	**8**	**1.2**	10	0.79	5	0.50	12	1.58
Rhagionidae	1						**1**	**0.1**	5	0.39	5	0.50	8	1.05
Athericidae									2	0.16				
Tabanidae	14	2	6	7	6	13	**19**	**2.8**	21	1.65	25	2.49	5	0.66
Vermileonidae	1			1			**1**	**0.1**						
Acroceridae													1	0.13
Bombyliidae	12	1		6		11	**13**	**1.9**	13	1.02	9	0.90		
Therevidae									2	0.16	2	0.20		
Asilidae	13	3	7	12		7	**17**	**2.5**	22	1.73	23	2.29	11	1.45
Empididae							**1**	**0.1**	29	2.28	8	0.80	7	0.92
Hybotidae									5	0.39	5	0.50	3	0.39
Microphoridae									2	0.16				
Dolichopodidae	1	1		1			**1**	**0.1**	13	1.02	25	2.49	6	0.79
CYCLORRHAPHA	222	144	122	132	73	127	**312**	**45.9**	830	65.35	601	59.92	506	66.67
Platypezidae											1	0.10		
Phoridae	3	2	2	2	1		**4**	**0.6**	203	15.98	1	0.10	2	0.26

Table 2. Continued

Families	Species of the Vrachanska Planina Mts.								Species of the Vitosha Mts.		Species of the Rila Mts.		Species of the Pirin Mts.	
	Belts			Parts			Total number							
	Xerothermic	Mixed	Beech	Western	Northern	Eastern	number	%	number	%	number	%	number	%
Pipunculidae									7	0.55	5	0.50	14	1.84
Syrphidae	40	11	11	6		34	**41**	**6.0**	130	10.24	149	14.86	49	6.46
Micropezidae									1	0.08				
Conopidae	3			2		1	**3**	**0.4**	8	0.63	20	1.99	2	0.26
Lonchaeidae									1	0.08				
Otitidae									1	0.08				
Platystomatidae									1	0.08				
Tephritidae	5	1		2		3	**5**	**0.7**	9	0.71	8	0.80	2	0.26
Piophilidae													1	0.13
Lauxaniidae											1	0.10		
Cremifaniidae											1	0.10		
Chamaemyiidae									6	0.47	1	0.10	12	1.58
Dryomyzidae									1	0.08				
Sciomyzidae	1			1			**1**	**0.1**	2	0.16	2	0.20		
Sepsidae									1	0.08			1	0.13
Agromyzidae									19	1.50	48	4.79	15	1.98
Opomyzidae									6	0.47	2	0.20	3	0.39
Periscelididae									1	0.08				
Braulidae									1	0.08				
Carnidae									3	0.24			5	0.66
Milichiidae									1	0.08	1	0.10	4	0.53
Chloropidae	22	12	10		6	11	**23**	**3.4**	79	6.22	61	6.08	72	9.49
Heleomyzidae	3	5	4	5	5		**8**	**1.2**	2	0.16	2	0.20		

Table 2. Continued

Families	Species of the Vrachanska Planina Mts.								Species of the Vitosha Mts.		Species of the Rila Mts.		Species of the Pirin Mts.	
	Belts			Parts			Total number							
	Xerothermic	Mixed	Beech	Western	Northern	Eastern	number	%	number	%	number	%	number	%
Sphaeroceridae	3			3			**3**	**0.4**			2	0.20	2	0.26
Camillidae													1	0.13
Drosophilidae	2	1	1	1		1	**2**	**0.3**			1	0.10		
Diastatidae											1	0.10	1	0.13
Ephydridae	6	3	3		3	3	**6**	**0.9**	29	2.28	26	2.59	33	4.35
Hippoboscidae	2	1	1	1		1	**2**	**0.3**	2	0.08	2	0.20	2	0.26
Nycteribiidae	5			5			**5**	**0.7**						
Scathophagidae	1	1	3	2	1	1	**4**	**0.6**	2	0.16	2	0.20		
Anthomyiidae	2	4	5	1	2	7	**10**	**1.5**	9	0.71	3	0.30	1	0.13
Fanniidae	4	6	8	4	5	1	**11**	**1.6**	2	0.16	2	0.20	6	0.79
Muscidae	27	26	25	19	3	5	**48**	**7.1**	53	4.17	55	5.48	49	6.45
Calliphoridae	6	6	6			6	**6**	**0.9**	15	1.18	14	1.40	3	0.39
Sarcophagidae	8	1	4	1		4	**8**	**1.2**	25	1.97	24	2.39	18	2.37
Rhinophoridae									1	0.08	1	0.10		
Hypodermatidae									1	0.08				
Gasterophilidae	1	1	1			1	**1**	**0.1**			3	0.30		
Tachinidae	78	63	38	77	47	48	**121**	**17.8**	209	16.46	162	16.15	203	26.74
Families	42	28	28	36	18	31	**45**	**42.1**	58	54.7	58	54.7	44	41.5
Species	473	213	254	317	191	287	**680**	**17.0**	1270	31.7	1003	25.1	759	19.0

Table 3. Species composition and distribution of the two-winged insects (Insecta: Diptera) of the Vrachanska Planina Mts.

Note. After the names of the families, the number of species (in brackets) established in the Vrachanski Balkan Nature Park has been presented.

Taxa	Distribution									References
	Localities	Vertical (m)	Belts			Parts			Total	
			Xerothermic	Mixed	Beech	Western	Northern	Eastern		
1	2	3	4	5	6	7	8	9	10	11
NEMATOCERA										
TIPULOMORPHA										
Tipulidae / 7 (6)										
Ctenophora (*Ctenophora*) *elegans* Meigen, 1818	✳ 45	350-370	♦					●	cse	26, 149
Nephrotoma cornicina (Linnaeus, 1758)	■ 47	382	♦						ho	103, 165
Nigrotipula nigra (Linnaeus, 1758)	▲, 44							●	tp	165
Tipula (*Acutipula*) *maxima* Poda, 1761	37	524	♦			●			ena	103, +++
♣ *Tipula* (*Tipula*) *oleracea* Linnaeus, 1758	▲, 44							●	ena, i, ? hn	84, 156, 171
Tipula (*Vestiplex*) *nubeculosa* Meigen, 1804	■ 20	457	♦			●			esca	103, 149
Tipula (*Yamatotipula*) *lateralis* Meigen, 1804	45, 47	350-380	♦					●	wcp	165
Limoniidae / 32 (32)										
Paradelphomyia (*Oxyrhiza*) *senilis* (Haliday, 1833)	14	380	♦			●			eca	130
Dicranophragma (*Brachylimnophila*) *nemorale* (Meigen, 1818)	■ 44							●	tp	103, 130
Pilaria fuscipennis (Meigen, 1818)	14	380	♦			●			des	130
Eloeophila verralli (Bergroth, 1912)	■ 44							●	? ena	103, 130
Pseudolimnophila (*Pseudolimnophila*) *lucorum* (Meigen, 1818)	14	380	♦			●			esca, ? wcp	130
Pseudolimnophila (*Pseudolimnophila*) *sepium* (Verrall, 1886)	14	380	♦			●			wp	130
Hexatoma (*Eriocera*) *chirothecata* (Scopoli, 1763)	45	350-370	♦					●	csean	129
Hexatoma (*Hexatoma*) *bicolor* (Meigen, 1818)	14	380	♦			●			eanna	130
Symplecta (*Symplecta*) *hybrida* (Meigen, 1804)	14	380	♦			●			ho	130

Table 3. Continued

Taxa	Distribution									References
	Localities	Vertical (m)	Belts			Parts			Total	
			Xerothermic	Mixed	Beech	Western	Northern	Eastern		
Molophilus (*Molophilus*) *bifidus* Goetghebuer, 1920	14	380	♦			●			eit	130
Molophilus (*Molophilus*) *propinquus* (Egger, 1863)	14	380	♦			●			tp	130
Dicranoptycha fuscescens (Schummel, 1829)	14	380	♦			●			wcp	130
Ellipteroides (*Ellipteroides*) *lateralis* (Macquart, 1835)	14	380	♦			●			ena, ? wp	130
Gonomyia (*Gonomyia*) *lucidula* de Meijere, 1920	■ 44							●	ean	103, 130
Gonomyia (*Gonomyia*) *recta* Tonnoir, 1920	14	380	♦			●			ean	130
Idiocera (*Idiocera*) *punctata* (Edwards, 1938)	14	380	♦			●			? wp	130
Idiocera (*Idiocera*) *sziladyi* (Lackschewitz, 1940)	45, 47	350-380	♦			●		●	? wpat	129, 130, 165
Helius (*Helius*) *flavus* (Walker, 1856)	14	380	♦			●			des	130
Antocha (*Antocha*) *vitripennis* (Meigen, 1830)	14	380	♦			●			? wp	130
Elliptera hungarica Madarassy, 1881	14	380	♦			●			cse	130
Orimarga (*Orimarga*) *attenuata* (Walker, 1848)	14	380	♦			●			ena, ? wp	130
Thaumastoptera (*Thaumastoptera*) *calceata* Mik, 1866	14	380	♦			●			eswa	130
Dicranomyia (*Dicranomyia*) *conchifera* (Strobl, 1900)	14	380	♦			●			e	130
Dicranomyia (*Dicranomyia*) *didyma* (Meigen, 1804)	14	380	♦			●			tp, ? wcp	130
Dicranomyia (*Dicranomyia*) *lucida* de Meijere, 1918	14	380	♦			●			ean	130
Dicranomyia (*Dicranomyia*) *mitis* (Meigen, 1830)	14	380	♦			●			wp	130
Dicranomyia (*Dicranomyia*) *modesta* (Meigen, 1818)	■ 44							●	h	103, 129, 130
Dicranomyia (*Glochina*) *tristis* (Schummel, 1829)	14	380	♦			●			ho, ? po	130
Geranomyia caloptera Mik, 1867	14	380	♦			●			? eanna	130
Limonia flavipes (Fabricius, 1787)	14	380	♦			●			ena	130
Limonia macrostigma (Schummel, 1829)	14	380	♦			●			po	130
Limonia nubeculosa Meigen, 1804	15, 22, 27, 38, 40, 42	450-1000	♦	♦		●	●		h	33, 34, 35, 54, 94
BIBIONOMORPHA										
Bibionidae / 1 (1)										
♣ *Bibio hortulanus* (Linnaeus, 1758)	▲, 44							●	wp	84, 156
Hesperinidae / 1 (1)										
Hesperinus imbecillus (Loew, 1858)	35	1266			♦	●			secan, csean	15

Table 3. Continued

Taxa	Distribution									References
	Localities	Vertical (m)	Belts			Parts			Total	
			Xerothermic	Mixed	Beech	Western	Northern	Eastern		
Mycetophilidae / 138 (138)										
Mycomya (*Cymomya*) *circumdata* (Stæger, 1840)	35	1266			♦	●			hoes	27, 28
Mycomya (*Mycomya*) *cinerascens* (Macquart, 1826)	23, 24	842-880			♦		●		ho	3, 27, 28
Mycomya (*Mycomya*) *marginata* (Meigen, 1818)	3, 29, 33, 50	250-850	♦	♦	♦	●	●	●	dp	3, 27, 28
Mycomya (*Mycomya*) *occultans* (Winnertz, 1863)	45	350-370	♦					●	po	9, 27, 28
Mycomya (*Mycomya*) *parva* (Dziedzicki, 1885)	23, 35	830-1266			♦	●	●		des	9, 27, 28
Mycomya (*Mycomya*) *tenuis* (Walker, 1856)	29, 35	350-1260	♦		♦	●	●		? h	3, 27, 28
Mycomya (*Mycomya*) *tridens* (Lundström, 1911)	24, 35, 45, 50	350-1266	♦	♦	♦	●	●	●	e	9, 27, 28
Mycomya (*Mycomya*) *winnertzi* (Dziedzicki, 1885)	29	250-350	♦				●		dpo	9, 27, 28
Mycomya (*Mycomyopsis*) *trilineata* (Zetterstedt, 1838)	29	250-350	♦				●		des	27, 28
Neoempheria proxima (Winnertz, 1863)	29	250-350	♦				●		des	27, 28
Neoempheria striata (Meigen, 1818)	45	350	♦					●	hoes	27, 28
Boletina anderschi Stannius, 1881	24	800			♦		●		csee	6, 27, 28
Boletina basalis (Meigen, 1818)	35	1280			♦	●			e	9, 27, 28
Boletina gripha Dziedzicki, 1885	3, 17, 29, 35	350-1250	♦	♦	♦	●	●	●	hoes	6, 27, 28
Boletina lundstroemi Landrock, 1912	17	800			♦	●			wes	6, 27, 28
Boletina nigricoxa Stæger, 1840	17	800			♦	●			? des	27, 28
Boletina nitida Grzegorzek, 1885	29	350	♦				●		des	27, 28
Boletina sciarina Staeger, 1840	45	350	♦					●	h	27, 28
Boletina trivittata (Meigen, 1818)	35	1250			♦	●			des	5, 27, 28
Coelosia flava (Stæger, 1840)	35	1250			♦	●			e	6, 27, 28
Ectrepesthoneura ledenikiensis Bechev, 1988	24	800			♦		●		Eb	7, 27, 28
Grzegorzekia collaris (Meigen, 1818)	35	1250			♦	●			e	6, 27, 28
Palaeodocosia vittata (Coquillett, 1901)	35	1250			♦	●			? h	6, 27, 28
Synapha vitripennis (Meigen, 1818)	29, 35	350-1250	♦		♦	●	●		? h	6, 27, 28
Tetragoneura ambigua (Grzegorzek, 1885)	3, 35	700-1250			♦	●		●	e	27, 28
Acnemia falcata Zaitzev, 1982	17	800			♦	●			? e	5, 27, 28
Acnemia longipes Winnertz, 1863	29	350	♦				●		des	5, 27, 28
Acnemia nitidicollis (Meigen, 1818)	29, 35	350-1250	♦		♦	●	●		des	27, 28

Table 3. Continued

Taxa	Distribution									References
	Localities	Vertical (m)	Belts			Parts			Total	
			Xerothermic	Mixed	Beech	Western	Northern	Eastern		
Acnemia vratzatica Bechev, 1985	50	550			♦		●		Er	4, 27, 28
Anaclileia beshovskii Bechev, 1990	35	1250			♦	●			e	12, 27, 28
Megalopelma nigroclavatum (Strobl, 1910)	35, 45	350-1250	♦		♦	●		●	h	11, 27, 28
Monoclona rufilatera (Walker, 1837)	29	300	♦				●		h	6, 27, 28
Neuratelia minor (Lundstrom, 1912)	24, 35	800-1250			♦	●	●		et	12, 27, 28
Neuratelia nemoralis (Meigen, 1818)	35	1250			♦	●			h	6, 27, 28
Phthinia humilis Winnertz, 1863	24, 33, 35	550-1250		♦	♦	●	●		h	27, 28
Sciophila baltica Zaitzev, 1982	35	1250			♦	●			e	27, 28
Sciophila lutea Macquart, 1826	29, 35, 45	350-1250	♦		♦	●	●	●	tp	5, 27, 28
Sciophila nonnisilva Hutson, 1979	29	350	♦				●		e, ? h	27, 28
Sciophila thoracica Stæger, 1840	29	350	♦				●		e	27, 28
Speolepta leptogaster (Winnertz, 1863)	45	350	♦					●	e, ? ho	27, 28
Docosia gilvipes (Haliday in Walker, 1856)	3, 29	350-700	♦		♦		●	●	tp	9, 27, 28
Docosia lastovkai Chandler, 1994	24	800			♦		●		csee	27, 28
Docosia moravica Landrock, 1916	45	350	♦					●	e	9, 27, 28
Docosia muranica Kurina & Ševčik, 2011	24	800			♦		●		csee	27, 28
Docosia nigra Landrock, 1928	50	600-650			♦		●		csee	27, 28
Leia bimaculata (Meigen, 1804)	29, 33, 35, 39, 45	250-1250	♦	♦	♦	●	●	●	tp, ? wcp	3, 27, 28, 149
Leia cylindrica (Winnertz, 1863)	29, 45	300-350	♦				●	●	e	6, 27, 28
Leia winthemii Lehmann, 1822	35	1250			♦	●			ho	6, 27, 28
Novakia scatopsiformis Strobl, 1893	24	800			♦		●		ena	27, 28
Rondaniella dimidiata (Meigen, 1804)	35	1250			♦	●			h	6, 27, 28
Allodia (*Allodia*) *lugens* (Wiedemann, 1817)	24, 29, 35, 50	300-1250	♦		♦	●	●		h	19, 28
Allodia (*Allodia*) *ornaticollis* (Meigen, 1818)	29	300	♦				●		h	19, 28
Allodia (*Brachycampta*) *alternans* (Zetterstedt, 1838)	24, 29, 35, 45	350-1250	♦		♦	●	●	●	h	19, 27, 28
Allodia (*Brachycampta*) *barbata* (Lundstrom, 1909)	29	300	♦				●		h	19, 27, 28
Allodia (*Brachycampta*) *foliifera* (Strobl, 1910)	45	350	♦					●	h	19, 27, 28

Table 3. Continued

Taxa	Distribution									References
	Localities	Vertical (m)	Belts			Parts			Total	
			Xerothermic	Mixed	Beech	Western	Northern	Eastern		
Allodia (*Brachycampta*) *grata* (Meigen, 1830)	24, 29, 33, 35, 50	300-1250	♦	♦	♦	●	●		des, ? dp	19, 27, 28
Allodia (*Brachycampta*) *neglecta* Edwards, 1925	33, 45	350-600	♦	♦		●		●	e	19, 27, 28
Allodia (*Brachycampta*) *pistillata* (Lundstrom, 1911)	29, 35	350-1250	♦		♦	●	●		h	19, 27, 28
Allodia (*Brachycampta*) *silvatica* (Landrock, 1912)	45	350	♦					●	dp	19, 27, 28
Allodia (*Brachycampta*) *triangularis* (Strobl, 1895)	29	300	♦				●		des, ? hoes	19, 27, 28
Allodia (*Brachycampta*) *westerholti* Caspers, 1980	24	800			♦		●		e	22, 27, 28
Allodiopsis domestica (Meigen, 1830)	35	1250			♦	●			h	11, 27, 28
Allodiopsis rustica (Edwards, 1941)	3, 24, 29, 45, 50	350-800	♦		♦		●	●	tp	27, 28
Anatella simpatica Dziedzicki, 1923	50	550-650			♦		●		h	9, 27, 28
Brevicornu (*Brevicornu*) *fissicauda* (Lundstrom, 1911)	29, 35, 45, 47	350-1250	♦		♦	●	●	●	h	14, 27, 28
Brevicornu (*Brevicornu*) *griseicolle* (Stæger, 1840)	3, 17, 29, 35, 50	350-1250	♦		♦	●	●	●	hoes, ? tp	27, 28
Brevicornu (*Brevicornu*) *sericoma* (Meigen, 1830)	17, 24, 29, 33, 35, 45	350-1250	♦	♦	♦	●	●	●	h	27, 28
Cordyla crassicornis Meigen, 1818	29, 45, 50	300-650	♦		♦		●	●	des	18, 27, 28
Cordyla fissa Edwards, 1925	17, 24, 29, 35	300-1300	♦	♦	♦	●	●		wes	18, 27, 28
Cordyla fusca Meigen, 1804	29	300	♦				●		wces	18, 27, 28
Cordyla murina Winnertz, 1863	17, 29, 45, 50	350-800	♦		♦	●	●	●	hoes	18, 27, 28
Cordyla nitens Winnertz, 1863	29	300	♦				●		wces	18, 27, 28
Exechia bicincta (Stæger, 1840)	3, 24, 29, 35, 45	350-1250	♦	♦	♦	●	●	●	h	9, 27, 28
Exechia dorsalis (Stæger, 1840)	24	800			♦		●		hoes	9, 27, 28
Exechia exigua Lundstrom, 1909	35, 45	350-1250	♦		♦	●		●	wces	9, 27, 28
Exechia fulva Santos Abreu, 1920	35	1250			♦	●			ena, ? csena	27, 28
Exechia fusca (Meigen, 1804)	10, 17, 24, 29, 35, 45	350-1250	♦	♦	♦	●	●	●	h	3, 27, 28
Exechia lundstroemi Landrock, 1923	24	800			♦		●		hoes	9, 27, 28
Exechia separata Lundstrom, 1912	35, 45	350-1250	♦		♦	●		●	h	9, 27, 28
Exechia seriata (Meigen, 1830)	24, 29, 35, 50	350-1250	♦	♦	♦	●	●		hoes, ? tp	27, 28

Table 3. Continued

Taxa	Distribution									References
	Localities	Vertical (m)	Belts			Parts			Total	
			Xerothermic	Mixed	Beech	Western	Northern	Eastern		
Exechiopsis (*Exechiopsis*) *furcata* (Lundstrom, 1911)	35, 40	800-1250			♦	●	●		e	27, 28, 33, 34, 35, 55
Exechiopsis (*Exechiopsis*) *indecisa* (Walker, 1856)	27, 40	800			♦		●		hoes	3, 27, 28, 33, 34, 35, 55
Exechiopsis (*Exechiopsis*) *intersecta* (Meigen, 1818)	22, 24	800-830			♦		●		e	3, 27, 28, 33, 34, 35, 55
Exechiopsis (*Exechiopsis*) *magnicauda* (Lundstrom, 1911)	24, 35	800-1250			♦	●	●		des	5, 27, 28
Exechiopsis (*Exechiopsis*) *vizzavonensis* (Edwards, 1928)	40	800			♦		●		ena, ? csena	3, 27, 28, 33, 34, 35, 55
Pseudobrachypeza helvetica (Walker, 1856)	50	450-600		♦	♦		●		e	16, 27, 28
Rymosia affinis Winnertz, 1863	35	1250			♦	●			wp	27, 28
Rymosia fasciata (Meigen, 1804)	24	800			♦		●		e	27, 28
Rymosia spinipes Winnertz, 1863	24	800			♦		●		wp	11, 27, 28
Synplasta gracilis Winnertz, 1863	35	1250			♦	●			e, ? des	14, 27, 28
Synplasta exclusa (Dziedzicki, 1910)	50	600-650		♦	♦		●		cee	28
Synplasta sintenisi (Lackschewitz, 1937)	50	600-650		♦	♦		●		e	14, 27
Tarnania dziedzickii (Edwards, 1941)	27	900-1000			♦		●		ena	3, 27, 28, 33, 34, 35, 55
Tarnania fenestralis (Meigen, 1838)	15, 22, 24, 27, 35, 40	350-1250	♦	♦	♦	●	●		e	3, 27, 28, 33, 34, 35, 55
Dynatosoma fuscicorne (Meigen, 1818)	24, 45	350-800	♦		♦		●	●	h	14, 27, 28
Dynatosoma majus Landrock, 1912	29, 45	350	♦				●	●	hoes	6, 27, 28
Epicypta torquata Matile, 1977	29	350	♦				●		csei	16, 27, 28
Mycetophila alea Laffoon, 1965	24, 29, 35	350-1250	♦		♦	●	●		h	27, 28
Mycetophila bialorussica Dziedzicki, 1884	24	800			♦		●		? tp	14, 27, 28
Mycetophila blanda Winnertz, 1863	24, 35, 45	350-1250	♦		♦	●	●	●	esca	27, 28
Mycetophila confluens Dziedzicki, 1884	24, 35	800-1250			♦	●	●		po	27, 28

Table 3. Continued

Taxa	Distribution									References
	Localities	Vertical (m)	Belts			Parts			Total	
			Xerothermic	Mixed	Beech	Western	Northern	Eastern		
Mycetophila czizekii Landrock, 1911	29, 33	350-600	♦	♦		●	●		e	27, 28
Mycetophila distigma Meigen, 1830	45	350	♦					●	e	27, 28
Mycetophila edwardsi Lundstrom, 1913	35, 45, 50	350-1250	♦		♦	●	●	●	e	27, 28
Mycetophila fungorum (De Geer, 1776)	17, 24, 29, 35, 45	350-1250	♦		♦	●	●	●	ho	3, 27, 28
Mycetophila luctuosa Meigen, 1830	17, 29, 33	350-800	♦	♦	♦	●	●	●	h	27, 28
Mycetophila marginata Winnertz, 1863	24, 29, 35, 45, 50	350-1250	♦	♦	♦	●	●	●	e	3, 27, 28
Mycetophila morosa Winnertz, 1863	35	1250			♦	●			h	16, 27, 28
Mycetophila ocellus Walker, 1848	17, 24, 29, 35, 45	350-1250	♦	♦	♦	●	●	●	h	27, 28
Mycetophila ornata Stephens, 1846	15, 24, 45	350-100	♦	♦	♦		●	●	des	3, 27, 28, 33, 34, 35, 55
Mycetophila pumila Winnertz, 1863	29	350	♦				●		dp	27, 28
Mycetophila signatoides Dziedzicki, 1884	33	550-600		♦		●			h	27, 28
Mycetophila spectabilis Winnertz, 1863	29, 35, 45, 50	350-1250	♦		♦	●	●	●	e	27, 28
Mycetophila stolida Walker, 1856	24	800			♦		●		h	27, 28
Mycetophila trinotata Stæger, 1840	35, 45, 50	350-1250	♦	♦	♦	●	●	●	h	27, 28
Phronia biarcuata (Becker, 1908)	45	350	♦					●	tp, ? h	27, 28
Phronia cinerascens Winnertz, 1863	45	350	♦					●	h	20, 27, 28
Phronia conformis (Walker, 1856)	29, 33	350-600	♦	♦			●	●	h	20, 27, 28
Phronia egregia Dziedzicki, 1889	33	550-600		♦		●			h	20, 27, 28
Phronia nitidiventris (van der Wulp, 1859)	33	550-600		♦		●			hoes	20, 27, 28
Phronia obtusa Winnertz, 1863	24, 45	350-800	♦		♦		●	●	h	20, 27, 28
Phronia signata Winnertz, 1863	33	550-600		♦		●			hoes	20, 27, 28
Phronia strenua Winnertz, 1863	33	550-600		♦		●			h	20, 27, 28
Sceptonia cryptocauda Chandler, 1991	24, 50	450-850		♦	♦		●		e	16, 27, 28
Sceptonia humerella Edwards, 1925	24	850			♦		●		e	16, 17, 27, 28
Sceptonia membranacea Edwards, 1925	33, 45, 50	350-600	♦	♦	♦	●	●	●	e	16, 27, 28

Table 3. Continued

Taxa	Distribution									References
	Localities	Vertical (m)	Belts			Parts			Total	
			Xerothermic	Mixed	Beech	Western	Northern	Eastern		
Sceptonia nigra (Meigen, 1804)	24, 35, 45	350-1250	♦		♦	●	●	●	h	16, 27, 28
Sceptonia pilosa Bukowski, 1934	29	350	♦				●		e	27, 28
Sceptonia tenuis Edwards, 1925	35	1250			♦	●			e	16, 27, 28
Trichonta apicalis Strobl, 1898	45	350	♦					●	e	11
Trichonta beata Gagne, 1981	50	600			♦		●		h	18, 27, 28
Trichonta falcata Lundstrom, 1911	29, 35, 45	350-1250	♦		♦	●	●	●	h	11, 27, 28
Trichonta fragilis Gagne, 1981	45, 50	350-650	♦		♦		●	●	h	11, 27, 28
Trichonta submaculata (Stæger, 1840)	24	800			♦		●		hoes	27, 28
Trichonta terminalis (Walker, 1856)	45	350	♦					●	h	11, 27, 28
Trichonta vitta (Meigen, 1830)	29	350	♦				●		h	27, 28
Trichonta vulgaris Loew, 1869	35	1250			♦	●			h	27, 28
Zygomyia humeralis (Wiedemann, 1817)	35	1250			♦	●			e	18, 27, 28
Ditomyiidae / 1 (1)										
Ditomyia fasciata (Meigen, 1818)	29, 35, 45	350-1250	♦		♦	●	●	●	? csei	3, 23, 25, 28
Bolitophilidae / 4 (4)										
Bolitophila (*Bolitophila*) *cinerea* Meigen, 1818	35	1250			♦	●			hoes	23, 25, 28
Bolitophila (*Bolitophila*) *saundersii* (Curtis, 1836)	35, 50	600-1250		♦	♦	●	●		tp	23, 25, 28
Bolitophila (*Cliopisa*) *fumida* Edwards, 1941	35	1250			♦	●			des	9, 25, 28
Bolitophila (*Cliopisa*) *pseudohybrida* Landrock, 1912	29, 45	350	♦				●	●	des	9, 23, 25, 28
Diadocidiidae / 1 (1)										
Diadocidia (*Diadocidia*) *ferruginosa* (Meigen, 1830)	24, 29, 35, 50	350-1250	♦		♦	●	●		tp, ? h	23, 25, 28
Keroplatidae / 26 (26)										
Cerotelion racovitzai Matile & Burghele-Balacesco, 1969	3, 29, 45, 50	350-900	♦	♦	♦		●	●	cseei	6, 25, 28
Cerotelion striatum (Gmelin, 1790)	45	350	♦					●	ei	23, 25, 28
Keroplatus reaumurii Dufour, 1839	45	350	♦					●	wp	21, 23, 25, 28
Keroplatus testaceus Dalman, 1818	45	350	♦					●	esit	6, 25, 28
Isoneuromyia semirufa (Meigen, 1818)	29	350	♦				●		des	3, 25, 28
Monocentrota matilei Bechev, 1989	45	350	♦					●	Er	10, 25, 28

Table 3. Continued

Taxa	Distribution									References
	Localities	Vertical (m)	Belts			Parts			Total	
			Xerothermic	Mixed	Beech	Western	Northern	Eastern		
Neoplatyura nigricauda (Strobl, 1893)	29	350	♦				●		e	6, 25, 28
Orfelia bezzii (Strobl, 1910)	45	350	♦					●	e	24, 25, 28
Orfelia discoloria (Meigen, 1818)	45	300	♦					●	h	3
Orfelia lugubris (Zetterstedt, 1851)	45	350	♦					●	e	11, 23, 25, 28
Orfelia nigricornis (Fabricius, 1805)	45	350	♦					●	eca	11, 23, 25, 28
Orfelia ochracea (Meigen, 1918)	45	350	♦					●	des	28
Orfelia unicolor (Stæger, 1840)	45	350	♦					●	hoes	23, 25
Pyratula perpusilla (Edwards, 1913)	10, 45	350-900	♦	♦		●		●	? wces	3, 18, 25, 28
Pyratula zonata (Zetterstedt, 1855)	45	350	♦					●	e	23, 25, 28
Macrocera anglica Edwards, 1925	29	350	♦				●		e	6, 25, 28
Macrocera angulata Meigen, 1818	45	350	♦					●	e	6, 25, 28
Macrocera centralis Meigen, 1818	10, 24	800-900		♦	♦	●	●		wes	23, 25, 28
Macrocera crassicornis Winnertz, 1863	45	350	♦					●	wp	25, 28
Macrocera fasciata Meigen, 1804	24, 29, 35, 45	350-1250	♦		♦	●	●	●	des	23, 25, 28
Macrocera nigricoxa Winnertz, 1863	45	350	♦					●	wcp	9, 25, 28
Macrocera parva Lundstrom, 1914	50	600-650			♦		●		? wces	18, 25, 28
Macrocera phalerata Meigen, 1818	29, 35, 45	350-1250	♦		♦	●	●	●	wcp	6, 23, 25, 28
Macrocera pilosa Landrock, 1917	24	800			♦		●		wces	14, 25, 28
Macrocera stigma Curtis, 1837	24, 35	800-1250			♦	●	●		wces	6, 25, 28
Macrocera vittata Meigen, 1830	10, 50	600-900		♦	♦	●	●		dp	3, 23, 25, 28
Sciaridae / 1										
Sciara hemerobioides (Scopoli, 1763)	✳, ■ 39	220-250	♦						po, ? e	149
Cecidomyiidae / 44 (29)										
♣ *Apiomyia bergenstammi* (Wachtl, 1882)	▲, 44							●	eswa	139, 172
Spurgia euphorbiae (Vallot, 1827)	26	500	♦			●			ena, i, h	160
Dasineura crataegi (Winnertz, 1853)	26	500	♦			●			e	160
Dasineura filicina (Kieffer, 1889)	44	550-650	♦	♦				●	dp	160
Dasineura hyperici (Bremi, 1847)	■ 13	550-700	♦	♦					e	160
Dasineura medicaginis (Bremi, 1847)	26	500	♦			●			wes	160
Dasineura papaveris (Winnertz, 1890)	■ 13	650		♦					cseean	160

Table 3. Continued

Taxa	Distribution									References
	Localities	Vertical (m)	Belts			Parts			Total	
			Xerothermic	Mixed	Beech	Western	Northern	Eastern		
Dasineura plicatrix (Loew, 1850)	■ 44	550-750	♦	♦				●	ena	160
♣ *Dasineura pyri* (Bouché, 1847)	▲, 26	500	♦			●			ha	84, 160
Dasineura rubella Kieffer, 1896	■ 13	700		♦					e	160
Dasineura ruebsaameni (Kieffer, 1909)	■ 13	650-750		♦					e	160
Dasineura schulzei Rübsaamen, 1917	26	500	♦			●			e	160
Dasineura sisymbrii (Schrank, 1803)	■ 44	550-750	♦	♦					e	160
Dasineura thomasiana (Kieffer, 1888)	■ 13	650-750		♦					e	160
Dasineura tortrix (F. Löw, 1877)	■ 13	650-750		♦					e	160
Dasineura tubularis (Kieffer, 1909)	■ 13	650-750		♦					cse	160
Dasineura urticae (Perris, 1840)	13, 26	500-650	♦	♦		●			des	160
Dasineura viciae (Kieffer, 1888)	26	500	♦			●			des, ? dp	160
♣ *Dryomyia circinans* (Giraud, 1861)	▲, 44							●	nmsfe	184
♣ *Dryomyia lichtensteinii* (F. Löw, 1878)	▲, 44							●	sena	184
Geocrypta galii (Loew, 1850)	26	500	♦			●			des, ? dp	160
Jaapiella floriperda (F. Löw, 1888)	26	500	♦			●			e	160
Jaapiella schmidti (Rubsaamen, 1912)	26	500	♦			●			e	160
Jaapiella veronicae (Vallot, 1827)	26	500	♦			●			e	160
♣ *Fabomyia medicaginis* (Rübsaamen, 1912)	▲, 44							●	west	84
Janetia cerris (Kollar, 1850)	13, 26	500-650	♦			●			dp	160
Janetia nervicola (Kieffer, 1909)	26	500	♦			●			csee	160
Janetia szepligetii Kieffer, 1896	26	500	♦			●			csean	160
Macrolabis lamii Rubsaamen, 1916	13, 26	500-650	♦			●			e	160
♣ *Mayetiola destructor* (Say, 1817)	▲, 44							●	ha	84, 95
Mikomya coryli (Kieffer, 1901)	■ 13	650		♦					ean	160
Rhopalomyia artemisiae (Bouché, 1834)	■ 13	650		♦					des	160
Zygiobia carpini (F. Löw, 1874)	■ 13	650		♦					e	160
Mikiola fagi (Hartig, 1839)	35	1250			♦	●			e, ? des	+++
Aschistonyx carpinicolus Rübsaamen, 1917	■ 13	650		♦					e, ? cse	160
Contarinia barbichei (Kieffer, 1890)	26	500	♦			●			e	160

Table 3. Continued

Taxa	Distribution									References
	Localities	Vertical (m)	Belts			Parts			Total	
			Xerothermic	Mixed	Beech	Western	Northern	Eastern		
Contarinia carpini Kieffer, 1897	■ 13	650		♦					e	160
Contarinia coryli (Kaltenbach, 1859)	▲, 44							●	esca	145
♣ *Contarinia medicaginis* Kieffer, 1895	▲, 44							●	h	84, 95, 155
♣ *Contarinia nasturtii* (Kieffer, 1888)	▲, ■ 13	650		♦					ean, i, h	84, 160
Contarinia quercicola (Rubsaamen, 1899)	13, 26	500-650	♦	♦		●			cse	160
♣ *Haplodiplosis marginata* (von Roser, 1840)	▲, 44							●	e	84
Macrodiplosis roboris (Hardy, 1854)	■ 13	650		♦					wesant	160
Putoniella pruni (Kaltenbach, 1872)	26	500	♦			●			e	160
Ptychopteridae / 1										
Ptychoptera (*Paraptychoptera*) *lacustris* Meigen, 1830	■ 5	770		♦					e, ? h	15
CULICOMORPHA										
Dixidae / 1 (1)										
Dixa maculata Meigen, 1818	9	390-400	♦			●			ena	1
▼ Culicidae / 6 (3)										
▼ *Anopheles* (*Anopheles*) *claviger* (Meigen, 1804)	■ 48								wcp	50
▼ *Anopheles* (*Anopheles*) *maculipennis* Meigen, 1818	▲, ■ 20		♦	♦	♦	●			hoes, ? tp	51, 60
▼ *Anopheles* (*Anopheles*) *plumbeus* Stephens, 1828	■ 48		♦	♦	♦				wp	50
Ochlerotatus (*Finlaya*) *geniculatus* (Olivier, 1791)	■ 48		♦	♦	♦				tp	50, 51
Culex (*Culex*) *pipiens* Linnaeus, 1758	▲, ■ 20, 35	450-1280	♦	♦	♦	●			hnat	50, 51
Culex (*Maillotia*) *hortensis* Ficalbi, 1889	▲, ■ 20		♦	♦	♦	●			wpo	50, 51
▼ Simuliidae / 8 (6)										
Prosimulium (*Prosimulium*) *rachiliense* Djafarov, 1954	■ 48				♦				seean	125
Simulium (*Wilhelmia*) *balcanicum* (Enderlein, 1924)	14	380	♦			●			ean, ? eanit	73
Simulium (*Wilhelmia*) *equinum* (Linnaeus, 1758)	14, 47	380	♦			●			po	73, 124
Simulium (*Nevermannia*) *lundstromi* (Enderlein, 1921)	? 45		♦					●	wp	124
Simulium (*Simulium*) *alajense* Rubtsov, 1938	30	380-233	♦			●			seess	125

Table 3. Continued

Taxa	Distribution									References
	Localities	Vertical (m)	Belts			Parts			Total	
			Xerothermic	Mixed	Beech	Western	Northern	Eastern		
Simulium (*Simulium*) *argenteostriatum* Strobl, 1898	■ 48		♦						csena	73, 124, 169
▼ *Simulium* (*Simulium*) *ornatum* Meigen, 1818	? 45, ■ 48	350	♦					●	tp, ? hop	73, 124, 169
▼ *Simulium* (*Simulium*) *colombaschense* (Scopoli, 1780)	■ 20, 48	230-457	♦			●			cee	52, 73, 122, 123, 169
▼ Ceratopogonidae / 20 (20)										
Atrichopogon (*Meloehelea*) *lucorum* (Meigen, 1818)	45	350-370	♦					●	h	183
Atrichopogon (*Psammopogon*) *flavolineatus* (Strobl, 1880)	45	350-370	♦					●	hom	183
▼ *Culicoides* (*Beltranmyia*) *circumscriptus* Kieffer, 1918	45	350-370	♦					●	ppt	146
Culicoides (*Culicoides*) *fagineus* Edwards, 1939	45	350-370	♦					●	wp	146
Culicoides (*Silvaticulicoides*) *fascipennis* (Staeger, 1839)	45	350-370	♦					●	? wp	146
Culicoides festivipennis Kieffer, 1914	45	350-370	♦					●	hop	146
Culicoides (*Culicoides*) *impunctatus* Goetghebuer, 1920	45	350-370	♦					●	? wcp	146
▼ *Culicoides kurensis* Dzhafarov, 1960	45	350-370	♦					●	hom	146
▼ *Culicoides* (*Culicoides*) *newsteadi* Austen, 1921	45	350-370	♦					●	wp	146
▼*Culicoides* (*Avaritia*) *obsoletus* (Meigen, 1818)	45	350-370	♦					●	h	146
Culicoides odiatus Austen, 1921	45	350-370	♦					●	sp, ? h	146
▼ *Culicoides pictipennis* (Staeger, 1839)	45	350-370	♦					●	wcp	146
▼ *Culicoides* (*Culicoides*) *pulicaris* (Linnaeus, 1758)	45	350-370	♦					●	pat	146
▼ *Culicoides* (*Culicoides*) *punctatus* (Meigen, 1804)	45	350-370	♦					●	pat	146
Culicoides (*Wirthomyia*) *reconditus* Campbell & Pelham-Clinton, 1960	45	350-370	♦					●	e	146
Culicoides (*Monoculicoides*) *riethi* Kieffer, 1914	45	350-370	♦					●	hop, ? h	146
▼ *Culicoides schultzei* (Enderlein, 1908)	45	350-370	♦					●	ppta	146
Culicoides (*Monoculicoides*) *stigma* (Meigen, 1818)	45	350-370	♦					●	ena, ? wp	146

Table 3. Continued

Taxa	Distribution									References
	Localities	Vertical (m)	Belts			Parts			Total	
			Xerothermic	Mixed	Beech	Western	Northern	Eastern		
Culicoides (*Silvaticulicoides*) *subfasciipennis* Kieffer, 1919	45	350-370	♦					●	wcp	146
Culicoides (*Pontoculicoides*) *tauricus* Gutsevich, 1959	45	350-370	♦					●	cset, ? nmt	146
Chironomidae / 15 (15)										
Tanypus (*Tanypus*) *punctipennis* Meigen, 1818	▲, 44							●	hno	58
Larsia curticalcar (Kieffer, 1918)	■ 20, 39	220-380	♦			●		●	wp	121, 157, 162, 163
Acricotopus lucens (Zetterstedt, 1850)	■ 20, 39	220-380	♦			●		●	h	121
Cricotopus (*Cricotopus*) *algarum* (Kieffer, 1911)	▲, ■ 20	233-380	♦			●		●	wces	157, 162, 163
Cricotopus (*Isocladius*) *sylvestris* (Fabricius, 1794)	▲, ■ 20	233-380	♦			●		●	hno	157, 162, 163
Eukiefferiella similis Goetghebuer, 1939	■ 20	233-380	♦			●		●	wcp, ? wces	157, 162
Metriocnemus (*Metriocnemus*) *eurynotus* (Holmgren, 1883)	9	400-500	♦			●			ho	1
Tvetenia calvescens (Edwards, 1929)	■ 20	233-380	♦			●		●	h	157, 162
Chironomus (*Chironomus*) *plumosus* (Linnaeus, 1758)	12, 20	233-380	♦			●		●	hno	121, 157, 162, 163
Chironomus (*Chironomus*) *riparius* Meigen, 1804	12, 20	233-380	♦			●		●	hn	58, 121, 157, 162, 163
Cryptochironomus (*Cryptochironomus*) *defectus* (Kieffer, 1913)	■ 20	233-380	♦			●		●	pa	121, 157, 162, 163
Dicrotendipes nervosus (Staeger, 1839)	12	320	♦			●			ho	121
Endochironomus tendens (Fabricius, 1775)	12, 20	233-380	♦			●		●	tp	121
Glyptotendipes (*Glyptotendipes*) *cauliginellus* (Kieffer, 1913)	12	320	♦			●			po	121
Tanytarsus gregarius Kieffer, 1909	12, 20	233-380	♦			●		●	h	121, 157, 162, 163

Table 3. Continued

Taxa	Distribution									References
	Localities	Vertical (m)	Belts			Parts			Total	
			Xerothermic	Mixed	Beech	Western	Northern	Eastern		
BRACHYCERA ORTHORRHAPHA										
STRATIOMYOMORPHA										
Stratiomyidae /8 (8)										
Actina chalybea Meigen, 1804	22	850			♦		●		e	30, 31, 33, 34
Chloromyia formosa (Scopoli, 1763)	▲, ■ 20	233-457	♦			●		●	h	148, 165
Chloromyia speciosa (Macquart, 1834)	✳, ■ 20	457	♦			●			? tp	148, 149
Odontomyia angulata (Panzer, 1798)	▲, 44							●	tp, ? hp	165
Odontomyia flavissima (Rossi, 1790)	■ 20	457	♦			●			wp	148, 149, 165
Odontomyia hydroleon (Linnaeus, 1758)	■ 20	457	♦			●			tp	149
Stratiomys chamaeleon (Linnaeus, 1758)	46	450	♦					●	esca	+++
Stratiomys longicornis (Scopoli, 1763)	▲, 44							●	hop	165
TABANOMORPHA										
Rhagionidae /1										
Chrysopilus splendidus (Meigen, 1820)	■ 47	382	♦						wes	165
▼ Tabanidae /19 (19)										
Nemorius vitripennis (Meigen, 1820)	✳, ■ 20	457	♦			●			cseit	62, 149
▼ *Chrysops* (*Chrysops*) *caecutiens* (Linnaeus, 1758)	✳ 45	350-370	♦					●	hoes, ? tp	62, 74, 149
Chrysops (*Chrysops*) *flavipes* Meigen, 1804	20	233-457	♦			●		●	spo	62, 74
Chrysops (*Chrysops*) *italicus* Meigen, 1804	✳, ■ 20	457	♦			●			mit, ? mwca	149
Chrysops (*Chrysops*) *viduatus* (Fabricius, 1794)	20, 25	233-987	♦	♦	♦	●	●		wesan	62, 74, 149
▼ *Atylotus rusticus* (Linnaeus, 1761)	✳, ■ 20	457	♦			●			wp	149,
Hybomitra pilosa (Loew, 1858)	7	260-270	♦					●	cse	62, 74
Tabanus bifarius Loew, 1858	25	987			♦		●		? mit	74
▼ *Tabanus bromius* Linnaeus, 1758	✳ 45	350-370	♦					●	wp	74, 149
Tabanus cordiger Meigen, 1820	✳ 45	350-370	♦					●	wp	62, 74, 149
Tabanus exclusus Pandelle, 1883	8, 36	1059-1234			♦	●	●		nm	74
Tabanus miki Brauer, 1880	45	350-370	♦					●	patn	62, 74
Tabanus rectus Loew, 1858	✳ 45	350-370	♦					●	nm	149
Tabanus spodopterus Meigen, 1820	✳ 45	350-370	♦					●	? csean	62, 74, 149

Table 3. Continued

Taxa	Distribution									References
	Localities	Vertical (m)	Belts			Parts			Total	
			Xerothermic	Mixed	Beech	Western	Northern	Eastern		
Tabanus sudeticus Zeller, 1842	7, 18	260-1221	♦		♦		●	●	ppta	62, 74
Tabanus tergestinus Egger, 1859	36, 45, 51	350-1221		♦	♦	●	●	●	eit, ? eswa	62, 74, 149
Haematopota pluvialis (Linnaeus, 1758)	▲, 44							●	hop, ? pat	62
Haematopota subcylindrica Pandelle, 1883	▲, 44							●	esit	62
Philipomyia graeca (Fabricius, 1794)	21, 45,	350-1100	♦		♦		●	●	csean	62, 74
Vermileonidae / 1 (1)										
Vermileo vermileo (Linnaeus, 1758)	52	392	♦			●			hom	153
Bombyliidae / 13 (13)										
Bombylisoma minimum (Scopoli, 1771)	7, 20, 45	260-450	♦			●		●	csei	149
Bombylella atra (Scopoli, 1763)	7, 20, 39	220-457	♦			●		●	tp	149
Bombylius (*Bombylius*) *canescens* Mikan, 1796	7	260-270	♦					●	h	149
Bombylius (*Bombylius*) *fulvescens* Wiedemann in Meigen, 1820	✳ 45	350-370	♦					●	wp, ? wcp	149
Bombylius (*Bombylius*) *major* Linnaeus, 1758	31	770-780		♦		●			ho	+++
Bombylius (*Bombylius*) *posticus* Fabricius, 1805	7, 45, 39	220-370	♦			●		●	wp	149
Systoechus gradatus (Wiedemann in Meigen, 1820)	✳ 45	350-370	♦					●	wp	149
Lomatia atropos Egger, 1859	✳ 45	350-370	♦					●	Ebs	149
Lomatia belzebul (Fabricius, 1794)	✳ 45	350-370	♦					●	wp	149
Lomatia sabea (Fabricius, 1781)	✳, ■ 20	457	♦			●			? mit	149
Hemipenthes morio (Linnaeus, 1758)	✳ 45	350-370	♦					●	h	149
Hemipenthes volutina (Meigen, 1820)	20, 45	350-457	♦			●		●	po	149
Villa hottentotta (Linnaeus, 1758)	✳ 45	350-370	♦					●	hop	149
Asilidae / 17 (14)										
Choerades dioctriaeformis (Meigen, 1820)	✳,45	350-370	♦					●	cse	149
Choerades fuliginosa (Panzer, 1798)	12, 45	320-370	♦			●		●	wces	149
Dioctria flavipennis Meigen, 1820	35	1250-1280			♦	●			esca	182
Molobratia teutonus (Linnaeus, 1767)	7	260-270	♦					●	esanca	182
Stichopogon scaliger Loew, 1847	✳, ■ 20	457	♦			●			? mit	149
Dasypogon diadema (Fabricius, 1781)	■ 48								wp	148, 182
Didysmachus picipes (Meigen, 1820)	■ 48		♦	♦	♦				west	182

Table 3. Continued

Taxa	Distribution									References
	Localities	Vertical (m)	Belts			Parts			Total	
			Xerothermic	Mixed	Beech	Western	Northern	Eastern		
Dysmachus bifurcus (Loew, 1848)	■ 20, 39	220-457	♦			●		●	eanit	149
Dysmachus fuscipennis (Meigen, 1820)	7, 35	260-1280	♦		♦	●		●	wesit	182
Dysmachus praemorsus (Loew, 1854)	35	1250-1280			♦	●			csean	182
Dysmachus stylifer (Loew, 1854)	7, 35	260-1280	♦		♦	●		●	eanit	182
Machimus gonatistes (Zeller, 1840)	■ 47	382-447	♦						wp	182
Machimus rusticus (Meigen, 1820)	■ 20	457	♦	♦		●			wp	149
Neoitamus cothurnatus (Meigen, 1820)	✳, ■ 20	457	♦			●			esca	148, 149
Neoitamus cyanurus (Loew, 1849)	35	1250-1280			♦	●			po	182
Philonicus albiceps (Meigen, 1820)	7, 14, 20	260-380	♦			●		●	tp, ? esanca	148, 182
Tolmerus atripes Loew, 1854	35, 47	447-1280	♦	♦	♦	●			ean	182
Empididae /1 (1)										
Empis (*Xanthempis*) *lutea* Meigen, 1804	50	450-650	♦	♦			●		e	72
Dolichopodidae /1 (1)										
Liancalus virens (Scopoli, 1763)	38, 42	445-577	♦	♦		●			wp	34, 54, 94
BRACHYCERA CYCLORRHAPHA										
Aschiza										
Phoridae /4 (3)										
Megaselia brevicostalis (Wood, 1910)	■ 47	382-447	♦						hn	159
Megaselia fusca (Wood, 1909)	42	445	♦			●			e	33, 34, 56, 94, 131
Triphleba antricola (Schmitz, 1918)	6, 42	445-1341	♦	♦	♦	●			e	33, 34, 96, 131
Triphleba aptina (Schiner, 1853)	22	850		♦	♦		●		cse	33, 34, 131
Syrphidae /41 (38)										
Dasysyrphus venustus (Meigen, 1822)	7, 45	260-370	♦					●	h	65, 149
Epistrophe grossulariae (Meigen, 1822)	45	350-370	♦					●	h	165
Episyrphus balteatus (De Geer, 1776)	▲, 12, 45	320-370	♦			●		●	poa	65, 149
Eriozona (*Megasyrphus*) *erratica* (Linnaeus 1758)	7, 14	260-380	♦			●		●	hoes	65
Eupeodes flaviceps (Rondani, 1857)	7	260-270	♦					●	west	65
Scaeva pyrastri (Linnaeus, 1758)	■ 47	382-447	♦						ho	165
Scaeva selenitica (Meigen, 1822)	▲, 14	380	♦			●			ho	2, 65

Table 3. Continued

Taxa	Distribution									References
	Localities	Vertical (m)	Belts			Parts			Total	
			Xerothermic	Mixed	Beech	Western	Northern	Eastern		
Sphaerophoria scripta (Linnaeus, 1758)	▲, 44		♦	♦	♦			●	ho	65, 165
Syrphus ribesii (Linnaeus, 1758)	▲, 44		♦	♦	♦			●	h	65
Syrphus vitripennis Meigen, 1822	▲, 44		♦	♦	♦			●	ho	65, 165
Xanthogramma pedissequum (Harris, 1776)	✳ 45	350-370	♦					●	tp	149
Chrysotoxum bicinctum (Linnaeus, 1758)	✳ 45	350-370	♦					●	tp, ? wcp	149
Chrysotoxum elegans Loew, 1841	✳ 45	350-370	♦					●	et, ? e	149
Chrysotoxum festivum (Linnaeus, 1758)	7	260-270	♦					●	po	65
Chrysotoxum vernale Loew, 1841	▲, ■ 20	457	♦	♦	♦	●			esca	65, 149
Paragus albifrons (Fallén, 1817)	45	350-370	♦					●	tp	149, 165
Paragus tibialis (Fallén, 1817)	45	350-370	♦					●	hpt	165
Pipizella virens (Fabricius, 1805)	■ 47	382-447	♦						tp	165
Cheilosia barbata Loew, 1857	14	380	♦			●			e	65
Cheilosia melanopa (Zetterstedt, 1843)	▲, 45	350-370	♦					●	e	65, 149
Cheilosia velutina Loew, 1840	7	260-270	♦					●	esca, ? hoes	149
Cheilosia vulpina (Meigen, 1822)	▲, 44		♦					●	wesit, ? e	65
Ferdinandea cuprea (Scopoli, 1763)	✳ 45	350-370	♦					●	hop	149
Volucella bombylans (Linnaeus, 1758)	45	350-370	♦					●	h	65, 149
Volucella inflata (Fabricius, 1794)	▲, 7, 45	260-370	♦					●	h	65, 149
Volucella pellucens (Linnaeus, 1758)	▲		♦	♦	♦				po	65
Volucella zonaria (Poda, 1761)	▲, 45	350-370	♦					●	tp	65, 149
Merodon avidus (Rossi, 1790)	▲, 45	350-370	♦					●	ena	65, 149
Merodon clavipes (Fabricius, 1781)	7	260-270	♦					●	ena	149
Sphiximorpha subsessilis (Illiger in Rossi, 1807)	✳, ■ 20	457	♦			●			ena	149
Eristalinus aeneus (Scopoli, 1763)	▲, 45	350-370	♦					●	hpta	65, 149
Eristalinus sepulchralis (Linnaeus, 1758)	45	350-370	♦					●	po	65
Eristalis arbustorum (Linnaeus, 1758)	▲, 45	350-370	♦					●	ho	65, 149, 165
Eristalis jugorum Egger, 1858	▲, 44		♦	♦	♦			●	e	65
Eristalis pertinax (Scopoli, 1763)	▲, 44							●	h	65, 165
Eristalis rupium Fabricius, 1805	▲, 44		♦	♦	♦			●	h	65
Eristalis similis (Fallén, 1817)	▲, 44		♦	♦	♦			●	h, ? wcp	65

Table 3. Continued

Taxa	Distribution									References
	Localities	Vertical (m)	Belts			Parts			Total	
			Xerothermic	Mixed	Beech	Western	Northern	Eastern		
Eristalis tenax (Linnaeus, 1758)	▲, 44		♦	♦	♦			●	k	65, 69, 165
Helophilus trivittatus (Fabricius, 1805)	▲, 44		♦	♦	♦			●	h, ? tp	65
Myathropa florea (Linnaeus, 1758)	▲, 44		♦	♦	♦			●	h	65, 149, 165
Syritta pipiens (Linnaeus, 1758)	▲, 45	350-370	♦					●	hno, ? sk	65, 149, 165
SCHIZOPHORA										
ACALYPTRATA										
Conopidae /3 (3)										
Conops (*Conops*) *silaceus* Wiedemann in Meigen, 1824	12	320	♦			●			se	149, 165
Thecophora atra (Fabricius, 1775)	■ 20, 47	447-457	♦			●			po	149, 165
Thecophora fulvipes (Robineau-Desvoidy, 1830)	45	350-370	♦					●	tp, ? hop	165
Tephritidae /5 (5)										
♣ *Carpomya schineri* (Loew, 1856)	▲, 44		♦					●	nmca	65, 84
Oxyna flavipennis (Loew, 1844)	■ 20	453	♦			●			wces	149
♣ *Rhagoletis cerasi* (Linnaeus, 1758)	▲, 44		♦	♦				●	wes	84, 139, 155, 172
Tephritis nigricauda (Loew, 1856)	7	260-270	♦					●	wp	149
Urophora solstitialis (Linnaeus, 1758)	12	320	♦			●			h	149
Sciomyzidae /1 (1)										
Sepedon (*Sepedon*) *sphegea* (Fabricius, 1775)	■ 20	453	♦			●			po	149
Chloropidae /23 (17)										
Dicraeus (*Dicraeus*) *tibialis* (Macquart, 1835)	▲, 44		♦	♦				●	ha	37
Elachiptera cornuta (Fallén, 1820)	▲, 34, 47	382-1114	♦	♦	♦			●	hop, ? wcp	37, 42, 165
Incertella albipalpis (Meigen, 1830)	▲, 44		♦	♦	♦			●	hoes	37, 42
Melanochaeta pubescens (Thalhammer, 1898)	▲, ■ 47		♦	♦	♦				wp	37, 42, 165
♣ *Oscinella* (*Oscinella*) *frit* (Linnaeus, 1758)	▲, 44		♦	♦	♦			●	k	37, 42, 84, 165, 171
Oscinella (*Oscinella*) *nigerrima* (Macquart, 1935)	▲, 44		♦	♦	♦			●	e	37, 42
Oscinella (*Oscinella*) *nitidissima* (Meigen, 1838)	▲		♦	♦	♦				h	37, 42, 165
Oscinella (*Oscinella*) *pusilla* (Meigen, 1830)	▲, 44		♦	♦	♦			●	hop	37, 42

Table 3. Continued

Taxa	Distribution									References
	Localities	Vertical (m)	Belts			Parts			Total	
			Xerothermic	Mixed	Beech	Western	Northern	Eastern		
Oscinimorpha arcuata (Duda, 1932)	▲, 44		♦	♦	♦			●	eswa	37, 42
Oscinimorpha minutissima (Strobl, 1900)	▲, 29	250-350	♦				●		wp	37, 42
Trachysiphonella pygmaea (Meigen, 1838)	28	218	♦				●		wes	40
Trachysiphonella ruficeps (Macquart, 1835)	▲, 28	218	♦				●		ena	37, 42
Trachysiphonella scutellata (von Roser, 1840)	45	350-370	♦					●	eca	165
Tricimba (*Nartshukiella*) *cincta* (Meigen, 1830)	▲, ■ 47	382-447	♦						h	42, 165
Tricimba (*Nartshukiella*) *humeralis* (Loew, 1858)	29	250-350	♦				●		hop	42
Tricimba (*Tricimba*) *lineella* (Fallén, 1820)	29	250-350	♦				●		h, ? hat	42
Camarota curvipennis (Latreille, 1805)	29, ■ 47	250-350	♦				●		ena	42, 165
♣ *Chlorops* (*Chlorops*) *pumilionis* (Bjerkander, 1778)	▲, 44		♦	♦				●	wcp	37, 84, 155, 170
Chlorops (*Chlorops*) *rufinus* (Zetterstedt, 1848)	■ 47	382-447	♦						hoes	165
Diplotoxa messoria (Fallén, 1820)	■ 47	382-447	♦						h	165
♣ *Lasiosina cinctipes* (Meigen, 1830)	▲, ■ 47	382-447	♦	♦	♦				tp	84, 37,165
♣ *Meromyza* (*Meromyza*) *saltatrix* (Linnaeus, 1761)	▲, 44		♦	♦	♦			●	h	37, 42, 84, 155, 165
Thaumatomyia rufa (Macquart, 1835)	44							●	po	42
Heleomyzidae /8 (8)										
Eccoptomera emarginata Loew, 1862	15, 22, 27, 30, 40, 49	500-1212	♦	♦	♦	●	●		e	33, 34, 35, 36, 56, 94
Eccoptomera pallescens (Meigen, 1830)	40	950-1000		♦			●		e	33, 34, 35, 55
Acantholeria cineraria (Loew, 1862)	54	900		♦			●		e	30, 33, 34, 35
Scoliocentra (*Leriola*) *brachypterna* (Loew, 1873)	42	445	♦			●			h	30, 33, 34, 36
Heleomyza (*Heleomyza*) *captiosa* (Gorodkov, 1962)	49	1212			♦	●			e	30, 33, 34, 36
Heleomyza (*Heleomyza*) *serrata* (Linnaeus, 1758)	22, 40, 49	850-1212		♦	♦	●	●		h	30, 33, 34, 35, 55, 56, 94
Heteromyza atricornis Meigen, 1830	30, 42	445-500	♦			●			e	30, 31, 33, 34, 35, 36, 55, 56, 94
Heteromyza commixta Collin, 1901	22	850		♦	♦		●		e	35, 31, 33, 34

Table 3. Continued

Taxa	Distribution								References
	Localities	Vertical (m)	Belts			Parts			Total	
			Xerothermic	Mixed	Beech	Western	Northern	Eastern		
Sphaeroceridae /3 (3)										
Crumomyia nigra (Meigen, 1830)	16	500	♦			●			h, ? ho	31, 33, 34, 35, 56, 94
Crumomyia nitida (Meigen, 1830)	16	500	♦			●			e	31, 33, 34, 35
Terrilimosina racovitzai (Bezzi, 1911)	38	577	♦			●			h	31, 33, 34, 36
Drosophilidae /2 (2)										
Phortica (*Phortica*) *variegata* (Fallén, 1823)	41	265	♦					●	po	30, 31, 33, 34, 36
Drosophila (*Sophophora*) *melanogaster* Meigen, 1830	6, 42	445-1341	♦	♦	♦	●			k	31, 33, 34, 36
Ephydridae /6 (6)										
Psilopa nitidula Fallén, 1813	▲, 44		♦	♦	♦			●	pat	41
Psilopa obscuripes Loew, 1860	▲, 44		♦	♦	♦			●	h	41
Psilopa polita (Macquart, 1835)	28	218	♦				●		dp	44
♣ *Hydrellia griseola* (Fallén, 1813)	44		♦	♦	♦			●	sk	41, 45
Nostima picta (Fallén, 1813)	28	218	♦				●		h	46
Hyadina guttata (Fallén, 1813)	28	218	♦				●		tp	46
SCHIZOPHORA CALYPTRATA										
Hippoboscidae /2 (2)										
Hippobosca equina Linnaeus, 1758	▲, 44		♦	♦	♦			●	ppta	61, 147
▼ *Melophagus ovinus* (Linnaeus, 1758)	▲, 14	380	♦			●			k	29, 61, 147
Nycteribiidae /5 (5)										
Nycteribia (*Nycteribia*) *schmidlii* Schiner, 1853	38	577	♦			●			wpat	33, 34, 111
Nycteribia (*Acrocholidia*) *vexata* Westwood, 1835	42	445	♦			●			wp	33, 34, 94, 110, 120
Phthiridium biarticulatum Hermann, 1804	38, 42	445-577	♦			●			wp	33, 34, 94, 111, 120, 151
Penicillidia conspicua Speiser, 1901	38	577	♦			●			om	33, 34, 35, 111

Table 3. Continued

Taxa	Distribution									References
	Localities	Vertical (m)	Belts			Parts			Total	
			Xerothermic	Mixed	Beech	Western	Northern	Eastern		
Penicillidia dufourii (Westwood, 1835)	38, 42	445-577	♦			●			? wpo	33, 34, 94, 110, 111, 120
Scathophagidae /4 (4)										
Scathophaga inquinata Meigen, 1826	35	1200			♦	●			e	133
Scathophaga lutaria (Fabricius, 1794)	35	1200			♦	●			wp	133
Scathophaga stercoraria (Linnaeus, 1758)	19	400-430	♦					●	hat, ? hnat	+++
Scathophaga suilla (Fabricius, 1794)	24	800-880		♦	♦		●		hat	133
Anthomyiidae /10 (10)										
Adia cinerella (Fallén, 1825)	▲, 44							●	ho	136
Paregle coerulescens (Strobl, 1893)	24	830		♦	♦		●		cse	133
Anthomyia pluvialis (Linnaeus, 1758)	▲, 44							●	hoa	136
♣ *Delia antiqua* (Meigen, 1826)	▲, 44							●	hn, ? k	53, 84, 155
♣ *Delia radicum* (Linnaeus, 1758)	▲, 44		♦	♦	♦			●	h	84, 155, 156
Egle ciliata (Walker, 1849)	24	850		♦	♦		●		h	133
Heterostylodes macrura (Schnabl, 1911)	35	1200			♦	●			e	133
Hylemya vagans (Panzer, 1798)	▲, 44		♦	♦	♦			●	wcp	136
♣ *Pegomya hyoscyami* (Panzer, 1809)	▲, 44							●	h	84, 95, 155, 156
Phorbia genitalis (Schnabl, 1911)	▲, 44							●	h	141, 155
Fanniidae /11 (10)										
▼ *Fannia canicularis* (Linnaeus, 1761)	▲, 14	380	♦			●			k	132, 136
Fannia lucidula (Zetterstedt, 1860)	35	1250-1280			♦	●			h	135
▼ *Fannia incisurata* (Zetterstedt, 1838)	▲, ■ 48		♦	♦	♦				hn	135, 136
Fannia latipalpis (Stein, 1892)	24	800-880		♦	♦		●		e	135, 137
Fannia lepida (Wiedemann, 1817)	24	800-880		♦	♦		●		ho	135, 137
Fannia manicata (Meigen, 1826)	35	1250-1280			♦	●			ho	135
Fannia monilis (Haliday, 1838)	24	800-880		♦	♦		●		wcp	135
Fannia polychaeta (Stein, 1895)	45	350-370	♦					●	e	137
Fannia postica (Stein, 1895)	24	830		♦	♦		●		h	135, 137
Fannia posticata (Meigen, 1826)	24	830		♦	♦		●		des	137
▼ *Fannia scalaris* (Fabricius, 1794)	▲, 14	380	♦			●			k	132, 136, 137

Table 3. Continued

Taxa	Distribution									References
	Localities	Vertical (m)	Belts			Parts			Total	
			Xerothermic	Mixed	Beech	Western	Northern	Eastern		
Muscidae /48 (27)										
▼ *Muscina levida* (Harris, 1780)	▲, 14	380	♦			●			h	132, 136, 137
Muscina pascuorum (Meigen, 1826)	24	830		♦	♦		●		ho	135
Muscina prolapsa (Harris, 1780)	■ 48	500-1500	♦	♦	♦				h	135, 137
▼ *Muscina stabulans* (Fallén, 1817)	▲, 14	380	♦			●			k	132, 136, 165
Thricops bukowskii (Ringdahl, 1934)	■ 5	770-780	♦	♦					seean	135, 137
Thricops simplex (Wiedemann, 1817)	■ 5	770-780	♦	♦					wp	135, 137
Drymeia vicana (Harris, 1780)	35	1250-1280			♦	●			esanca	135, 137
▼ *Hydrotaea armipes* (Fallén, 1825)	▲, 24	830		♦	♦		●		ho	135, 136
▼ *Hydrotaea dentipes* (Fabricius, 1805)	▲, ■ 48	500-1500	♦	♦	♦				hno	135, 136
Hydrotaea ignava (Harris, 1780)	▲, ■ 48	500-1500	♦	♦	♦				sk	135, 137
Hydrotaea irritans (Fallén, 1823)	▲, ■ 48	500-1500	♦	♦	♦				po	135, 136
Musca amita Hennig, 1964	14	380	♦			●			esca	132
▼ *Musca autumnalis* De Geer, 1776	▲, 44		♦	♦	♦			●	hpt	132, 136, 165
▼ *Musca domestica* Linnaeus, 1758	▲, 44		♦	♦	♦			●	k	132, 135, 136, 165
▼ *Musca larvipara* Porchinskiy, 1910	▲, 44		♦	♦				●	wcp, ? tp	135, 136
Musca tempestiva Fallén, 1817	▲, ■ 47	382-447	♦						ppt	135, 136, 165
Musca vitripennis Meigen, 1826	▲, ■ 48	500-1500	♦	♦	♦				ppt	135, 136, 137, 165
Morellia podagrica (Loew, 1857)	■ 5	770-780		♦					h	135
Morellia simplex (Loew, 1857)	▲, ■ 48		♦	♦	♦				tp	135, 137
Neomyia cornicina (Fabricius, 1781)	▲, ■ 48		♦	♦	♦				sk	135, 136, 165
Pyrellia vivida Robineau-Desvoidy, 1830	▲, 14	380	♦			●			hno	132, 136
Eudasyphora cyanella (Meigen, 1826)	■ 5	770-780		♦					wpat	133
Eudasyphora cyanicolor (Zetterstedt, 1845)	■ 5	770-780		♦					hptn	135, 136
Dasyphora albofasciata (Macquart, 1839)	▲, ■ 48		♦	♦					? hom	135, 165
Dasyphora penicillata (Egger, 1865)	14, 35	380-1280	♦		♦	●			wp, ? hom	132, 135
Dasyphora pratorum (Meigen, 1826)	▲, 14	380	♦			●			wp	132, 136
Stomoxys calcitrans (Linnaeus, 1758)	▲, 44		♦	♦	♦			●	k	137, 165

Table 3. Continued

Taxa	Distribution									References
	Localities	Vertical (m)	Belts			Parts			Total	
			Xerothermic	Mixed	Beech	Western	Northern	Eastern		
Phaonia angelicae (Scopoli, 1763)	24	850		♦	♦		●		tp	135
Phaonia lugubris (Meigen, 1826)	■ 5	770-780		♦					h	135
Phaonia pallida (Fabricius, 1787)	▲, 44	350-370	♦					●	? wp	137, 149
Phaonia scutellata (Zetterstedt, 1845)	35	1250-1280			♦	●			ena	135
Phaonia subventa (Harris, 1780)	■ 5	770-780		♦					h	135
Phaonia tuguriorum (Scopoli, 1763)	■ 47	382-447	♦						h	135
Helina calceataeformis (Schnabl & Dziedzicki, 1911)	35	1250-1280			♦	●			wcp	135
Helina cinerella (van der Wulp, 1867)	14	380	♦			●			h	134, 137
Helina confinis (Fallén, 1825)	35	1250-1280			♦	●			hn	135
Helina latitarsis Ringdahl, 1924	35	1250-1280			♦	●			ean	135
Helina obscurata (Meigen, 1826)	35	1250-1280			♦	●			ho	135
Helina reversio (Harris, 1780)	35	1250-1280			♦	●			ho	135
Helina tetrastigma (Meigen, 1826)	14	380	♦			●			eswa	83, 137
Mydaea ancilla (Meigen, 1826)	35	1250-1280			♦	●			wces	135
Mydaea electa (Zetterstedt, 1860)	■ 5	770-780		♦					h	135
Myospila meditabunda (Fabricius, 1781)	▲, ■ 48		♦	♦					hno	135, 136, 137
Hebecnema umbratica (Meigen, 1826)	▲, ■ 48		♦	♦					ho	135, 136
Hebecnema vespertina (Fallén, 1823)	35	1250-1280			♦	●			h	135
Graphomya maculata (Scopoli, 1763)	35	1250-1280			♦	●			po, ? poa	135
Spilogona dispar (Fallén, 1823)	35	1250-1280			♦	●			wesan	135
Macrorchis meditata (Fallén, 1825)	▲, ■ 5	770-780		♦					? tp	135, 137
Calliphoridae /6 (6)										
Calliphora vicina Robineau-Desvoidy, 1830	▲, 44		♦	♦	♦			●	k	71, 112, 113, 136
Calliphora vomitoria (Linnaeus, 1758)	▲, 44		♦	♦	♦			●	sk	71, 112
Lucilia caesar (Linnaeus, 1758)	▲, 44		♦	♦	♦			●	hno	71, 112, 136, 165
▼ *Lucilia sericata* (Meigen, 1826)	▲, 44		♦	♦	♦			●	k	71, 136

Table 3. Continued

Taxa	Distribution									References
	Localities	Vertical (m)	Belts			Parts			Total	
			Xerothermic	Mixed	Beech	Western	Northern	Eastern		
Protophormia terraenovae (Robineau-Desvoidy, 1830)	▲, 44		♦	♦	♦			●	h	136
Pollenia rudis (Fabricius, 1794)	▲, 44		♦	♦	♦			●	sk	136, 165
Sarcophagidae /8 (5)										
Miltogramma testaceifrons (von Roser, 1840)	■ 39	220-250	♦						e	149
▼ *Ravinia pernix* (Harris, 1780)	▲, 44		♦	♦	♦			●	? ppt	136
Sarcophaga (*Helicophagella*) *rosellei* Bottcher, 1912	■ 47	382-447	♦						? des	70
Sarcophaga (*Heteronychia*) *schineri* Bezzi, 1891	■ 47	382-447	♦						e	70
Sarcophaga (*Bercaea*) *africa* (Wiedemann, 1824)	▲, 14	380	♦			●			sk	83, 136
Sarcophaga (*Liosarcophaga*) *tuberosa* Pandelle, 1896	45	350-370	♦					●	ho	70
Sarcophaga (*Parasarcophaga*) *albiceps* Meigen, 1826	45	350-370	♦					●	hoa	70
Sarcophaga (*Sarcophaga*) *carnaria* (Linnaeus, 1758)	▲, ✳ 45	350-370	♦					●	hno	70, 112, 149
Gasterophilidae /1 (1)										
Gasterophilus intestinalis (De Geer, 1776)	▲, 44		♦	♦	♦			●	k	64
Tachinidae /121 (121)										
Exorista (*Exorista*) *larvarum* (Linnaeus, 1758)	4, 7, 14, 31	270-780	♦	♦		●	●	●	hop, h	+++
Exorista (*Podotachina*) *grandis* (Zetterstedt, 1844)	19	420	♦					●	ess, ? wp	+++
Exorista (*Adenia*) *mimula* (Meigen, 1824)	46	450	♦					●	tp, ? hn	+++
Exorista (*Adenia*) *rustica* (Fallén, 1810)	37	524	♦			●			hop, ? hnat	+++
Parasetigena silvestris (Robineau-Desvoidy, 1863)	46	450	♦					●	des, ? ha	+++
Phorocera assimilis (Fallén, 1810)	51	630	♦	♦			●		des	+++
Phorocera obscura (Fallén, 1810)	19	420	♦					●	des, ? h	+++
Meigenia dorsalis (Meigen, 1824)	31, 46	450-780	♦	♦		●		●	hoes	+++
Meigenia mutabilis (Fallén, 1810)	14	380	♦			●			wcp	138
Zaira cinerea (Fallén, 1810)	31	780		♦		●			tp, ? h	+++
Oswaldia muscaria (Fallén, 1810)	34	1100			♦			●	des	+++
Oswaldia spectabilis (Meigen, 1824)	31	780		♦		●			e	+++

Table 3. Continued

Taxa	Distribution									References
	Localities	Vertical (m)	Belts			Parts			Total	
			Xerothermic	Mixed	Beech	Western	Northern	Eastern		
Erynniopsis antennata (Rondani, 1861)	14	380	♦			●			? hom, h*, i	+++
Blondelia nigripes (Fallén, 1810)	4, 21, 32, 51	400-1100	♦	♦	♦	●	●		tp, h*, i	+++
Compsilura concinnata (Meigen, 1824)	26, 29, 31, 45	300-780	♦	♦		●	●	●	hoes, sk*, i	+++
Winthemia quadripustulata (Fabricius, 1794)	23	840		♦			●		h	+++
Aplomya confinis (Fallén, 1820)	45	360	♦					●	hop	149
Epicampocera succincta (Meigen, 1824)	32	680		♦		●			tp	+++
Phryxe nemea (Meigen, 1824)	21, 24	880-1100			♦		●		hoes	+++
Phryxe vulgaris (Fallén, 1810)	2, 8	560-1060		♦	♦			●	h	+++
Pseudoperichaeta nigrolineata (Walker, 1853)	25, 34, 37	520-1100	♦	♦	♦	●		●	des	+++
Lydella stabulans (Meigen, 1824)	2	520	♦				●		wes	+++
Drino atropivora (Robineau-Desvoidy, 1830)	46	450	♦					●	sp, ? spat	+++
Drino inconspicua (Meigen, 1830)	32, 34	680-1100		♦	♦	●		●	wces	+++
Huebneria affinis (Fallén, 1810)	31, 37	520-780	♦	♦		●			ess	+++
Carcelia (*Carcelia*) *gnava* (Meigen, 1824)	37	524	♦			●			des, ? h	+++
Carcelia (*Carcelia*) *lucorum* (Meigen, 1824)	2, 17	570-800	♦	♦		●	●		tp, ? po	+++
Alsomyia capillata (Rondani, 1859)	4	400		♦			●		hom	+++
Platymya fimbriata (Meigen, 1824)	35	1280			♦	●			tp, bm	+++
Eumea linearicornis (Zetterstedt, 1844)	31, 34	780-1114		♦	♦	●		●	hoes	+++
Zenillia libatrix (Panzer, 1798)	21	1100			♦		●		hoes	+++
Clemelis pullata (Meigen, 1824)	4, 31, 35	400-1280	♦	♦	♦	●	●		wcp	+++
Pales pavida (Meigen, 1824)	4, 23, 29	250-830	♦	♦		●	●		hop	+++
Bothria frontosa (Meigen, 1824)	32	690	♦	♦		●			ess, ? hoes	+++
Allophorocera ferruginea (Meigen, 1824)	35	1280			♦	●			hoes, ? des	+++
Eurysthaea scutellaris (Robineau-Desvoidy, 1848)	2, 19	400-570	♦				●	●	e	+++
Sturmia bella (Meigen, 1824)	23	840		♦			●		po	+++
Blepharipa pratensis (Meigen, 1824)	8, 19	400-1060	♦	♦	♦		●	●	tp, h*	+++
Masicera silvatica (Fallén, 1810)	4, 21	400-1100	♦	♦	♦		●		e	+++
Prosopea nigricans (Egger, 1861)	32	690		♦		●			wcp	+++
Gaedia distincta Egger, 1861	32	690		♦		●			ess	+++
Gonia bimaculata Wiedemann, 1819	14	380	♦			●			atm	+++

Table 3. Continued

Taxa	Distribution									References
	Localities	Vertical (m)	Belts			Parts			Total	
			Xerothermic	Mixed	Beech	Western	Northern	Eastern		
Gonia capitata (De Geer, 1776)	2, 21	510-1100	♦	♦	♦		●		wcp	+++
Gonia picea (Robineau-Desvoidy, 1830)	4	400	♦				●		wcp	+++
Pseudogonia parisiaca (Robineau-Desvoidy, 1851)	37	524	♦			●			ess	+++
Pseudogonia rufifrons (Wiedemann, 1830)	46	450	♦					●	ppta	+++
Spallanzania hebes (Fallén, 1820)	29	350	♦				●		ho	+++
Tachina (*Tachina*) *grossa* (Linnaeus, 1758)	8, 31	780-1060		♦	♦	●	●		hoes	+++
Tachina (*Eudoromyia*) *fera* (Linnaeus, 1761)	4, 20, 21, 28, 31, 36	250-1230	♦	♦	♦	●	●	●	hop	149, +++
Tachina (*Eudoromyia*) *magnicornis* (Zetterstedt, 1844)	19, 20, 29, 31, 34, 37, 45	250-1130	♦	♦	♦	●	●	●	hop	149, +++
Tachina (*Eudoromyia*) *nupta* (Rondani, 1859)	31	770-780		♦		●			tp	+++
Tachina (*Servillia*) *lurida* (Fabricius, 1781)	4, 17	400-800	♦	♦		●	●		wp	+++
Tachina (*Echinogaster*) *praeceps* Meigen, 1824	19, 31	400-780	♦	♦		●		●	wp	+++
Nowickia (*Fabriciella*) *ferox* (Panzer, 1809)	35	1250			♦	●			wes	+++
Peleteria ferina (Zetterstedt, 1844)	20	450	♦			●			hoes	149
Peleteria rubescens (Robineau-Desvoidy, 1830)	14, 29, 31, 34	300-1100	♦	♦	♦	●	●	●	tp	+++
Peleteria varia (Fabricius, 1794)	14, 19, 29, 31, 34, 53	250-1100	♦	♦	♦	●	●	●	ppta	+++
Nemoraea pellucida (Meigen, 1824)	44	380-400	♦					●	tp	168
Linnaemya (*Linnaemya*) *comta* (Fallén, 1810)	14, 21, 29, 31, 46	220-1100	♦	♦	♦	●	●	●	ho	+++
Linnaemya (*Bonellimyia*) *impudica* (Rondani, 1859)	31	770-780		♦		●			cse, ? e	+++
Linnaemya (*Ophina*) *haemorrhoidalis* (Fallén, 1810)	35	1280			♦	●			hoes, bm	+++
Linnaemya (*Ophina*) *picta* (Meigen, 1824)	32	665-690		♦		●			po	+++
Linnaemya (*Homoeonychia*) *lithosiophaga* (Rondani, 1859)	37	524	♦			●			? hom	+++
Ernestia rudis (Fallén, 1810)	31	780		♦		●			tp	+++
Eurithia caesia (Fallén, 1810)	21	1100			♦		●		hoes	+++
Hyalurgus lucidus (Meigen, 1824)	36	1234			♦	●			wces, bm	+++

Table 3. Continued

Taxa	Distribution									References
	Localities	Vertical (m)	Belts			Parts			Total	
			Xerothermic	Mixed	Beech	Western	Northern	Eastern		
Gymnocheta viridis (Fallén, 1810)	3	850		♦				●	wces	+++
Zophomyia temula (Scopoli, 1763)	25, 28	220-990	♦	♦			●		tp	+++
Cleonice callida (Meigen, 1824)	34	1100			♦			●	des	+++
Loewia brevifrons (Rondani, 1856)	31, 45	450-780	♦	♦		●		●	nm	+++
Macquartia chalconota (Meigen, 1824)	31, 34	780-1100		♦	♦	●		●	wes	+++
Macquartia dispar (Fallén, 1820)	31	780		♦		●			ess	+++
Macquartia praefica (Meigen, 1824)	4	400	♦				●		hom	+++
Macquartia tenebricosa (Meigen, 1824)	14, 19, 28, 46	220-450	♦			●	●	●	wcp	+++
Graphogaster brunnescens Villeneuve, 1907	31	780		♦		●			ess	+++
Actia crassicornis (Meigen, 1824)	14	380	♦			●			ess	+++
Peribaea tibialis (Robineau-Desvoidy, 1851)	7	270	♦					●	spat	+++
Siphona cristata (Fabricius, 1805)	31	780		♦		●			h	+++
Aphria longirostris (Meigen, 1824)	8, 14, 26	380-1060	♦	♦	♦	●	●		wcp	+++
Demoticus plebejus (Fallén, 1810)	45	350-370	♦					●	wes	149
Bithia glirina (Rondani, 1861)	34, 45	350-1100	♦		♦			●	wes	+++
Bithia modesta (Meigen, 1824)	19, 20, 45	250-450	♦			●		●	hom, spat	+++
Leskia aurea (Fallén, 1820)	3, 25, 34	800-1100		♦	♦		●	●	hoes	+++
Mintho rufiventris (Fallén, 1817)	45	350-370	♦					●	tp	+++
Microphthalma europaea Egger, 1860	4	400	♦				●		? om	+++
Billaea fortis (Rondani, 1862)	31	780		♦		●			des	+++
Billaea irrorata (Meigen, 1826)	14, 26	380-500	♦			●			e	+++
Billaea pectinata (Meigen, 1826)	14	380	♦			●			mca	+++
Billaea triangulifera (Zetterstedt, 1844)	34	1120			♦			●	hoes	+++
Dinera carinifrons (Fallén, 1817)	11, 36	815-1230		♦	♦	●			hoes	+++
Dinera ferina (Fallén, 1817)	1, 31	350-780	♦	♦		●	●		wes	+++
Estheria petiolata (Bonsdorff, 1866)	35	1260			♦	●			wces	+++
Estheria picta (Meigen, 1826)	37	524	♦			●			wcp	+++
Dexia rustica (Fabricius, 1775)	31, 34, 37	524-1100	♦	♦		●		●	hoes	+++
Prosena siberita (Fabricius, 1775)	20, 21	450-1100	♦		♦	●	●		hpta	149, +++
Zeuxia cinerea Meigen, 1826	7	260-270	♦					●	wp	+++

Table 3. Continued

Taxa	Distribution									References
	Localities	Vertical (m)	Belts			Parts			Total	
			Xerothermic	Mixed	Beech	Western	Northern	Eastern		
Eriothrix rufomaculatus (De Geer, 1776)	21	1100			♦		●		tp	+++
Athrycia trepida (Meigen, 1824)	37	524	♦			●			tp	+++
Voria ruralis (Fallén, 1810)	46	450	♦					●	k	+++
Phyllomya volvulus (Fabricius, 1794)	25	980		♦	♦		●		hoes	+++
Thelaira nigripes (Fabricius, 1794)	45	350-370	♦					●	tp	+++
Stomina caliendrata (Rondani, 1862)	14	380	♦			●			mca	+++
Eliozeta helluo (Fabricius, 1805)	4, 29, 37, 45	350-520	♦			●	●	●	tp	+++
Eliozeta pellucens (Fallén, 1820)	31	780		♦		●			des	+++
Clytiomya continua (Panzer, 1798)	11	820		♦		●			tp	+++
Ectophasia crassipennis (Fabricius, 1794)	1, 31, 37, 45	350-780	♦	♦		●	●	●	tp	149, +++
Ectophasia oblonga (Robineau-Desvoidy, 1830)	4, 11, 25	400-980	♦	♦	♦	●	●		wp	+++
Gymnosoma clavatum (Rohdendorf, 1947)	7, 32	260-690	♦	♦		●		●	tp	+++
Gymnosoma dolycoridis Dupuis, 1961	1, 11, 19	350-820	♦	♦		●	●	●	ess	+++
Gymnosoma nitens Meigen, 1824	2	550	♦				●		esca	+++
Gymnosoma rotundatum (Linnaeus, 1758)	8, 11, 19, 25, 37, 45	350-1060	♦	♦	♦	●	●	●	tp	+++
Elomya lateralis (Meigen, 1824)	4	400	♦				●		tp	+++
Phasia (*Phasia*) *obesa* (Fabricius, 1798)	37	534	♦			●			tp	+++
Phasia (*Phasia*) *subcoleoptrata* (Linnaeus, 1767)	19	400	♦					●	tp	+++
Phasia (*Hyalomya*) *pusilla* Meigen, 1824	31	780		♦		●			tp	+++
Dionaea aurifrons (Meigen, 1824)	10	820		♦		●			tp	+++
Clairvillia biguttata (Meigen, 1824)	31	780		♦		●			dp	+++
Cylindromyia (*Cylindromyia*) *bicolor* (Olivier, 1812)	4, 31, 37, 45	350-780	♦	♦		●	●	●	mca	+++
Cylindromyia (*Cylindromyia*) *brassicaria* (Fabricius, 1775)	8, 12, 34, 45, 50	320-1120	♦	♦	♦	●	●	●	hop	149, +++
Cylindromyia (*Neocyptera*) *auriceps* (Meigen, 1838)	2	550	♦				●		tp	+++
Phania funesta (Meigen, 1824)	37, 43	445-530	♦			●			e	+++

Table 4. Zoogeographical characteristics of Diptera (Insecta) according to the vegetation belts of the Vrachanska Planina Mts.

Areographical categories	Total Number	Vegetation belts		
		Oak forests		Beech forests (over 900-1000 m)
		Xerothermic oak (to 600-700 m)	Xeromeso-phylic and mesophylic mixed (to 900-1000 m)	
Species distributed in Palaearctic and out of it	**214 (31.6)**	**140 (30.7)**	**75 (35.5)**	**93 (37.1)**
NORTH TYPE	**209 (30.7)**	**135 (29.6)**	**75 (35.5)**	**93 (37.1)**
Cosmopolitan	13 (1.9)	13 (2.8)	8 (3.8)	8 (3.2)
Semicosmopolitan	6 (0.9)	6 (1.3)	5 (2.4)	5 (2.0)
Holarctic-Paleotropical-Neotropical	1 (0.1)		1 (0.5)	
Holarctic-Paleotropical-Australian	2 (0.3)	2 (0.4)		1 (0.4)
Holarctic-Paleotropical	2 (0.3)	2 (0.4)	1 (0.5)	1 (0.4)
Holarctic-Neotropical-Oriental	8 (1.2)	8 (1.7)	3 (1.4)	2 (0.8)
Holarctic-Neotropical-Afrotropical	1 (0.1)	1 (0.2)	1 (0.5)	1 (0.4)
Holarctic-Oriental-Australian	2 (0.3)	1 (0.2)		
Holarctic-Neotropical	5 (0.7)	3 (0.7)	1 (0.5)	2 (0.8)
Holarctic-Afrotropical	3 (0.4)	2 (0.4)	2 (0.9)	1 (0.4)
Holarctic-Oriental	27 (4.0)	16 (3.5)	8 (3.8)	12 (4.8)
Holarctic-Australian	2 (0.3)	1 (0.2)		
Palaearctic-Paleotropical-Australian	5 (0.7)	5 (1.1)	2 (0.9)	3 (1.2)
Palaearctic-Oriental-Australian	1 (0.1)	1 (0.2)		
Palaearctic-Paleotropical	4 (0.6)	4 (0.9)	2 (0.9)	2 (0.8)
Palaearctic-Afrotropical-Neotropical	1 (0.1)	1 (0.2)		
Palaearctic-Afrotropical	3 (0.4)	3 (0.7)	1 (0.5)	1 (0.4)
Palaearctic-Oriental	18 (2.6)	12 (2.6)	4 (1.9)	5 (2.0)
Palaearctic-Australian	1 (0.1)	1 (0.2)		

Table 4. Continued

Areographical categories	Total Number	Vegetation belts		
		Oak forests		Beech forests (over 900-1000 m)
		Xerothermic oak (to 600-700 m)	Xeromeso-phylic and mesophylic mixed (to 900-1000 m)	
West Palaearctic-Afrotropical	3 (0.4)	2 (0.4)	1 (0.5)	
West Palaearctic-Oriental	2 (0.3)	2 (0.4)	1 (0.5)	1 (0.4)
Disjunct Palaearctic-Oriental	1 (0.1)	1 (0.2)		
Holarctic	98 (14.4)	48 (10.5)	34 (16.1)	48 (19.1)
SOUTH TYPE	**5 (0.7)**	**5 (1.1)**		
South Palaearctic-Afrotropical	1 (0.1)	1 (0.2)		
South Palaearctic-Oriental	1 (0.1)	1 (0.2)		
Afrotropical-Mediterranean	1 (0.1)	1 (0.2)		
Oriental-Mediterranean	2 (0.3)	2 (0.4)		
Species with Palaearctic distribution	**472 (69.4)**	**316 (69.3)**	**136 (64.4)**	**158 (62.9)**
PALAEARCTIC TYPE	**207 (30.4)**	**160 (35.1)**	**55 (26.1)**	**54 (21.5)**
Holopalaearctic	16 (2.3)	14 (3.1)	7 (3.3)	5 (2.0)
Transpalaearctic	59 (8.7)	42 (9.2)	21 (9.9)	16 (6.4)
West and Central Palaearctic	20 (2.9)	17 (3.7)	8 (3.8)	7 (2.8)
West Palaearctic	44 (6.5)	38 (8.3)	8 (3.8)	7 (2.8)
Disjunct Palaearctic	8 (1.2)	6 (1.3)	4 (1.9)	2 (0.8)
South Palaearctic	2 (0.3)	2 (0.4)		
European-Anatolian-North African	2 (0.3)	2 (0.4)		
European-North African	19 (2.8)	13 (2.8)	1 (0.5)	5 (2.0)
Eurosiberian-Anatolian-Central Asian	2 (0.3)	1 (0.2)		1 (0.4)
Eurosiberian-Central Asian	10 (1.5)	8 (1.7)	1 (0.5)	3 (1.2)
Eurosiberian-Iran-Turanian	2 (0.3)	1 (0.2)		

Table 4. Continued

Areographical categories	Total Number	Vegetation belts		
		Oak forests		Beech forests (over 900-1000 m)
		Xerothermic oak (to 600-700 m)	Xeromesophylic and mesophylic mixed (to 900-1000 m)	
West Eurosiberian-Iran-Turanian	2 (0.3)	2 (0.4)		1 (0.4)
West Eurosiberian-Anatolian-Turanian	2 (0.3)		1 (0.5)	
West Eurosiberian-Anatolian	2 (0.3)	1 (0.2)	1 (0.5)	2 (0.8)
West Eurosiberian-Turanian	3 (0.4)	2 (0.4)	1 (0.5)	1 (0.4)
European-Central Asian	3 (0.4)	3 (0.7)		
European-Southwest Asian	4 (0.6)	3 (0.7)	1 (0.5)	1 (0.4)
European-Anatolian-Iran-Turanian	2 (0.3)	2 (0.4)		1 (0.4)
European-Iran-Turanian	2 (0.3)	1 (0.2)	1 (0.5)	1 (0.4)
European-Iranian	1 (0.1)	1 (0.2)		
European-Turanian	2 (0.3)	1 (0.2)		1 (0.4)
EUROSIBERIAN TYPE	**227 (33.4)**	**126 (27.6)**	**75 (35.5)**	**97 (38.6)**
Holoeurosiberian	36 (5.3)	15 (3.3)	14 (6.6)	23 (9.2)
West and Central Eurosiberian	16 (2.3)	7 (1.5)	3 (1.4)	8 (3.2)
West Eurosiberian	12 (1.7)	8 (1.7)	5 (2.4)	6 (3.4)
Disjunct Eurosiberian	35 (5.1)	24 (5.3)	8 (3.8)	13 (5.2)
European and South Siberian	9 (1.3)	5 (1.1)	5 (2.4)	
European-Anatolian	8 (1.2)	4 (0.9)	3 (1.4)	2 (0.8)
European	88 (12.9)	51 (11.2)	30 (14.2)	36 (14.3)
Central and East European	1 (0.1)		1 (0.5)	1 (0.4)
Central and South European-Anatolian	4 (0.6)	3 (0.7)		2 (0.8)
Central and Southeast European-Anatolian	2 (0.3)	1 (0.2)	1 (0.5)	
Central (Middle) and South European	10 (1.5)	6 (1.3)	5 (2.4)	2 (0.8)
Central and Southeast European	6 (0.9)	2 (0.4)		4 (1.6)

Table 4. Continued

Areographical categories	Total Number	Vegetation belts		
		Oak forests		Beech forests (over 900-1000 m)
		Xerothermic oak (to 600-700 m)	Xeromeso-phylic and mesophylic mixed (to 900-1000 m)	
MEDITERRANEAN TYPE	**34 (5.0)**	**28 (6.1)**	**6 (2.8)**	**5 (2.0)**
North Mediterranean and South Far East	1 (0.1)			
Mediterranean-Central Asian	3 (0.4)	3 (0.7)	1 (0.5)	
North Mediterranean-Central Asian	1 (0.1)	1 (0.2)		
Mediterranean-Iran-Turanian	4 (0.6)	3 (0.7)		1 (0.4)
Southeast European and South Siberian	1 (0.1)	1 (0.2)		
Central and South European-Iran-Turanian	1 (0.1)	1 (0.2)		
Central (Middle) and South European-Iranian	3 (0.4)	3 (0.7)		1 (0.4)
Central (Middle) and South European-Turanian	1 (0.1)	1 (0.2)		
Central and Southeast European-Iranian	1 (0.1)	1 (0.2)	1 (0.5)	1 (0.4)
Central and South European-North African	1 (0.1)	1 (0.2)		
South European-North African	1 (0.1)			
Holomediterranean	9 (1.3)	8 (1.7)	2 (0.9)	
North Mediterranean	3 (0.4)	2 (0.4)	1 (0.5)	1 (0.4)
South European	1 (0.1)	1 (0.2)		
Southeast European-Anatolian	3 (0.4)	2 (0.4)	1 (0.5)	1 (0.4)
ENDEMICS	**4 (0.6)**	**2 (0.4)**		**2 (0.8)**
Balkan subendemic	1 (0.1)	1 (0.2)		
Balkan endemic	1 (0.1)			1 (0.4)
Regional endemic	2 (0.3)	1 (0.2)		1 (0.4)
Total	**680**	**456 (67.1)**	**211 (31.0)**	**251 (36.9)**

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Диптерите (Insecta: Diptera) на Врачанската планина

ЗДРАВКО ХУБЕНОВ

(Резюме)

От Врачанската планина са известни 680 вида двукрили, които спадат към 45 семейства. От тях 625 вида са установени в границите на ПП „Врачански Балкан". Най-многобройни са Mycetophilidae (138 вида – 20.3%), Tachinidae (121 вида – 17.8%) и Muscidae (48 вида – 7.1%). Най-много видове са намерени в пояса на ксеротермните дъбови гори (473 вида – 69.5%) и в Западния дял на планината (317 вида – 46.6%). Установените видове принадлежат към 78 ареалографски категории. В зоогеографско отношение се очертават 2 основни групи: 1) видове с медитерански тип на разпространение (39 вида – 5.7%) – по-топлолюбиви и разпространени предимно в южните части на Палеарктика, към които са прибавени и 5 вида от южен тип, разпространени и извън Палеарктика; 2) видове с палеарктичен и евросибирски тип на разпространение (643 вида – 94.5%) – по-студенолюбиви и по-широко разпространени в Палеарктика, към които са отнесени и 209 вида от северен тип, разпространени и извън Палеарктика. Ендемичните видове са 4 (0.6%). Разгледано е разпределението на видовете по зоогеографски категории в растителните пояси. Диптерната фауна е сравнена с тази на планините Витоша, Рила и Пирин.

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The northernmost point of distribution of the European free-tailed bat *Tadarida teniotis* (Rafinesque, 1814) (Mammalia: Chiroptera) in Bulgaria

Heliana Dundarova, Stoyan Goranov, Dimitar Ragyov

Abstract. The most northern point of distribution of the European free-tailed bat was recorded in the Razhishkata Cave, Vratchanska Planina Mountains. This is the first record of the species in the Vrachanski Balkan Nature Park (protected area) and SCI BG0000166 Vrachanski Balkan (Natura 2000 zone). Further, the cave probably is used as a swarming site by six other bat species. However, *Tadarida teniotis* is using the rock crevices around the cave as a day roost.

Key words: Bulgaria, *Tadarida*, distribution.

Introduction

The European free-tailed bat *Tadarida teniotis* (Rafinesque, 1814) was reported for first time in Bulgaria by Kalčev & Beshkov (1963) and after almost 30 years has been recorded by Pandurska (1992). Whereafter, Benda et al. (2003) summarized the existed data and totally ten localities in South Bulgaria was described. The first record of the species in the north part of Bulgaria was reported by Pandurski & Karaivanov (2007). Considering that the available data is based mainly on ultrasonic records and rarely based on captured individuals, *Tadarida teniotis* is one of the rarest bat species in Bulgaria.

Material and Methods

Razhishkata cave (N 43°5′24.29″ E 23°23′10.44″) is located in Vratchanska Planina Mts. and was surveyed over the swarming period on 26/08/2017 and 08-09/09/2017. Bats were captured using mist nets (16 mm mesh size, length of 6m) placed at the cave entrance. All body measurements were taken with a plastic calliper. Species identification followed the field guide of Dietz & von Helversen (2004). All bats were released at the site of their capture after their identification. All surveys are in accordance with better European practices for cave and bat research and under licenses № 716/03.08.2017 from the Ministry of Environment and Water of Bulgaria.

Results

In August and September 2017, the European free-tailed bats (fig. 1) were captured in front of the Razhishkata Cave, Vratchanska Planina Mountains for the first time. In addition, this is a new and the most northern point of the species distribution in Bulgaria.

Totally six bat species have been identified in Razhishkata Cave. From them, nine Lesser mouse-eared bat (*Myotis blythii*), nineteen Common noctules (*Nyctalus noctula*), two Savi's Pipistrelle (*Hypsugo savii*), four Serotine bat (*Eptesicus serotinus*), one Gray Big-eared Bat (*Plecotus austriacus*) and four individuals of the European free-tailed bat (*Tadarida teniotis*) were captured (table 1).

Fig.1. *Tadarida teniotis* from Vratchanska Planina Mts.

Table 1. Bat species composition in Razhishkata Cave during the research period (m=male, f=female).

Species	26. 08. 2017	08-09. 09 2017
Myotis blythii	3 m	6 m
Nyctalus noctula	4 m, 4 f	5 m, 6 f
Hypsugo savii	1 m	1 m
Eptesicus serotinus	1 m, 1 f	1 m, 1 f
Plecotus austriacus		1 m
Tadarida teniotis	2 m	2 m

Discussion

The species bat composition and the predominance of male individuals (table 1) suggests that the Razhishkata Cave is a potential swarming site. Such caves were earlier described by Schunger *et al.* 2004 in Central Balkan and by Dundarova (2018) in Western Rhodopes. Exceptionally, the European free-tailed bat was captured only in front of and not into the cave. According to the literature (Benda & Piraccini 2016, Dietz & Kiefer 2016) the species roosts in inaccessible cliffs and rock crevices in the Mediterranean region. Therefore, *T. teniotis* probably used the rock crevices around the Razhishkata Cave as a day roost but not as a swarming site. However, the newly establishment location of the species in Vratchanska Planina Mts. reveals the recent expansion of the most northern points of its areal.

This is the first record of the species in the Vrachanski Balkan Nature Park (ExEA 2018) and SCI BG0000166 Vrachanski Balkan (EEA 2018).

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Най-северната точка на разпространение на Булдоговия прилеп *Tadarida teniotis* (Rafinesque, 1814) (Mammalia: Chiroptera) в България

Хелиана Дундарова, Стоян Горанов, Димитър Рагьов

(Резюме)

Булдоговият прилеп *Tadarida teniotis* (Rafinesque, 1814) е един от най-рядко установяваните прилепи в България. До скоро бяха известни около десет находища в южната част и само едно в северна част на страната. През 2017 година за първи път бяха хванати четири индивида от вида пред Ръжишката пещера, Врачански Балкан. Тази пещера се явява и най-северната точка на разпространение на *Tadarida teniotis* в България.

В Ръжишката пещера, бяха установени още пет вида прилепи (*Myotis blythii, Nyctalus noctula, Hypsugo savii, Eptesicus serotinus, Plecotus austriacus*), при които численото превъзходство беше в полза на мъжките индивиди. Този факт обуславя пещерата като потенциален „swarming site" или място за комуникация и размножаване при прилепите преди периода на хибернация.

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Faunistic diversity of Vrachanski Balkan Nature Park, a synopsis

Dimitar Bechev, Dilian Georgiev

Abstract. All the information on the animal species diversity of the Vrachanski Balkan Nature Park included in first and second parts of this issue was summarized. A total of 2290 species from Vrachanski Balkan Nature Park and some more 81 species from the region of Vrachanska Planina Mts., out of the park borders are recorded. From all, 348 are new records to the park and the mountain, and 354 species are of conservation importance. The local endemics are 21 species and 5 subspecies, 19 species and 2 subspecies are Bulgarian endemics, and 27 species and 16 subspecies are Balkan endemics. Almost all of the local endemics (20 species and 5 subspecies) are troglobites (14 sp.) and stygobites (6 sp.). Most of the troglobites are also and endemics, and/or preglacial relicts.

Key words: fauna, diversity, endemics, Bulgaria.

Introduction

Till the beginning of 21st century there were no any broad scale investigations on the fauna of Vrachanski Balkan Mts. Because of the presence of large karstic areas with many caves the attention of the zoologists was paid mainly there. Consequently a lot of information was obtained about the invertebrate underground fauna. Later, at the beginning of 21st century along the activities considering the management plant of the nature park there a synopsis of all data about the faunal diversity was made. Following animal groups were mainly considered: Mollusca, Araneae, Myriapoda, Orthoptera, Lepidoptera, Diptera and Aves. It was presented in the Management plan of Nature Park "Vrachanski Balkan" but not officially published. Some of the information together with new, original studies was included in the first part of "Faunistic Diversity of Vrachanski Balkan Nature Park" (Bechev & Georgirv 2015), and this issue (Bechev & Georgirv 2019).

All the information on the animal species diversity of the Vrachanski Balkan Nature Park was summarized, including the both special issues of ZooNotes (Bechev & Georgirv 2015, 2019). Also the unpublished data in the Management plan of Nature Park "Vrachanski Balkan" (2011) was used.

A big part of Vrachanska Planina Mts. is situated in the borders of the Vrachanski Balkan Nature Park. Out of the park are mostly the lowest peripheral mountain parts and territories at urban areas and roads. In the old literature the collection localities are often not pointed exactly and it is difficult to know if they are out or in the park`s territory, or even the mountain. However, possibly only a few fish and freshwater molluscs species reported for the rivers at the mountain borders does not inhabit the park area. That's why there are no any vast differences between the fauna of both the mountain and the park.

First data on the fauna of Vrachanski Balkan Mountains

The very first information concerning the fauna of Vrachanska Planina Mts. is this in the article "Gli aracnidi Turchi" of the Italian researcher Pietro Pavesi (Pavesi 1876). In this paper there are 10 spider species reported for Vratsa (possibly the region of Vratsa Town), including and the species *Argiope bruennichi*.

First Bulgarians who published faunal data about the area are Yoakimov (1904) for Mezdra (Bechev & Pavlova 2016) and Nedelkov (1908) for Vratsa (Popov & Chobanov 2016).

The first, new to science animal species described from Vrachanska Planina Mts. is the eyeless carabid beetle *Pheggomisetes bureschi* (Fig. 1) from Ledenika Cave (Knirsh 1923).

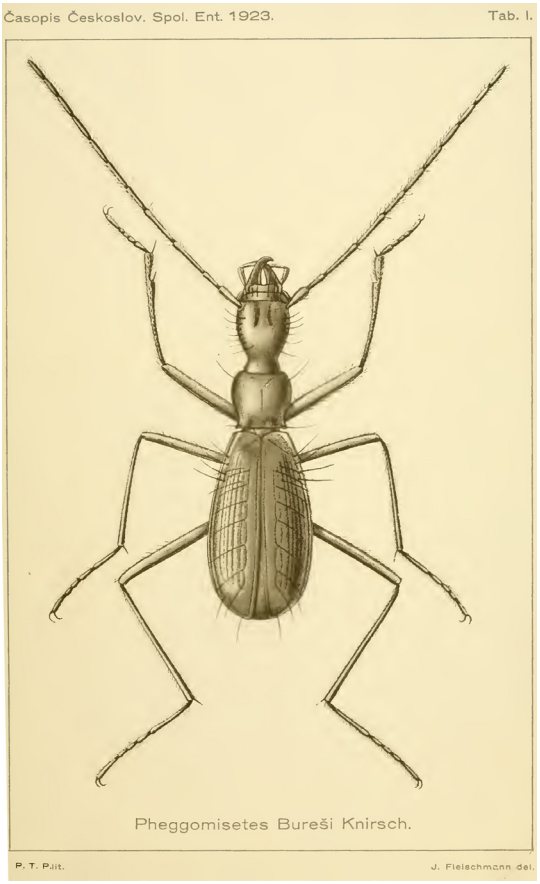

Fig.1. *Pheggomisetes bureschi,* original drawing by Knirsh (1923).

Current gaps in the faunal knowledge of the area

In the both special issues of ZooNotes about this area we didn't manage to include papers about some animal species groups as Protozia, Nematoda, Acaromorpha, Neuroptera, Trichoptera, Hemiptera, Coleoptera: Curculionidae, Lepidoptera and other.

We consider that excluding Lepidoptera (information on which are included in the current issue) the rest the animal groups are poorly studied in the region.

Results and discussion

All the information on the animal species diversity of the Vrachanski Balkan Nature Park was summarized, including the both special issues of ZooNotes. A total of 2290 species from Vrachanski Balkan Nature Park and some more 81 species from the region of Vrachanska Planina Mts., out of the park borders are recorded. (Table 1, 2). From all, 348 are new records to the park and the mountain and 354 species are of conservation importance.

Endemics

The local endemics for the park are 21 species and 5 subspecies, 19 species and 2 subspecies are Bulgarian endemics, and 27 species and 16 subspecies are Balkan endemics. Almost all of the local endemics (20 species and 5 subspecies) are troglobites (14 sp.) and stygobites (6 sp.). Most of the endemic troglobites are and preglacial relicts, e.g. *Sphaeromides bureschi* and *Tricyphoniscus bureschi* (Crustacea: Isopoda), *Paralola buresi* (Opiliones), *Trachysphaera lakatnicensis* (Mydiapoda: Diplopoda) (Beron 2016), *Centromerus bulgarianus* (Aranei) (Deltshev & Lazarov 2016) and others.

Table 1. Taxonomic diversity of the investigated groups in Vrachanski Balkan Nature Park (VBNP).

Taxa		Number species in VBNP	Number species in Bulgaria*	Local endemic species and subspecies	Species with conservation importance	References
Protozoa		6	1607	-	-	[9]
Plathelminthes	Cestoda	20	313	-	-	[30]
Nematoda		7	1007	-	-	[9]
Nematomorpha		1	7	-	-	[2]
Acanthocephala		4	52	-	-	[14]
Annelida		8	288	-	-	[24], [9]
Mollusca	Gastropoda	102	373	4	31	[12], [20], [22]
	Bivalvia	2	74	-	-	[20]
Tardigrada		6	20	-	-	[19]

[Table 1. Continued ▼]

[Table 1. Continued ▼]

Taxa			Number species in VBNP	Number species in Bulgaria*	Local endemic species and subspecies	Species with conservation importance	References
Arthropoda	Crustacea		41	1056	2	-	[9], [34]
	Arachnida	Scorpiones	1	5	-	-	[17], [9]
		Pseudoscorpiones	10	59	3	-	[9], [40]
		Opiliones	10	61	1	-	[9]
		Araneae	110	998	-	-	[40], [13]
		Acaromorpha	11	1583	-	-	[9]
	Myriapoda		38	222	2	-	[42]
	Insecta	Diplura	3	11	-	-	[9]
		Collembola	13	208	-	-	[9]
		Thysanura	1	4	-	-	[9]
		Ephemeroptera	18	102	-	-	[46]
		Odonata	10	68	-	3	[36], [3]
		Plecoptera	20	101	-	27	[45]
		Blattodea	1	16	-	-	[41]
		Manthodea	1	4	-	-	[41]
		Orthoptera	79	225	-	1	[41]
		Psocoptera	11	33	-	-	[23]
		Coleoptera	401	6000	8/5	4	[6], [39], [9], [44], [25]
		Rhaphidioptera	1	14	-	-	**
		Hymenoptera	185	4000	-	-	[1], [29]
		Trichoptera	30	258	-	-	[16], [9]
		Lepidoptera	214	2900	-	13	[48]
		Siphonaptera	4	75	-	-	[9]
		Diptera	625	3500	1	-	[9], [7], [18], [27]

[Table 1. Continued ▼]

Taxa		Number species in VBNP	Number species in Bulgaria*	Local endemic species and subspecies	Species with conservation importance	References
Vertebrata	Amphibia	11	19	-	11	[31]
	Reptilia	16	37	-	16	[31]
	Aves	208	428	-	192	[SD]
	Mammalia	61	97	-	58	[33], [21], [38], [15]
Total number		2290	26042	21/5	354	

* According Hubenov (2008).

** Bechev, unpublished observation.

Table 2. Number of species from the region of Vrachanska Planina Mts., out of the park borders.

Taxa		Number of spacies	References
	Coleoptera	17	[25], [39]
	Diptera	55	[27]
Pisces		9	[11], [37]
Total number		81	

Table 3. Endemic species and subspecies of the investigated groups in Vrachanski Balkan Nature Park (VBNP). Abbreviations: **+** or **+/** – species; **/+** – subspecies; **VRE** – Vrachanska Planina Mts. endemic; **BGE** – Bulgarian endemic; **BPE** – Balkan Peninsula endemic; **Vr_Ir** – Bulgarian endemic known from Vrachanska Mts. and Iskar River Gorge only.

Taxa	aquatic	stygobites	terrestrial	troglobites	VRE	BGE	BPE	References
GASTROPODA	**4**	**4**	**24**	**-**	**4**	**9**	**12/5**	
HYDROBIIDAE								
Belgrandiella hessei Wagner, 1927	+	+			+			[20]
Belgrandiella pussilla Angelov, 1959	+	+			+			[20]
Bythiospeum bureschi (Wagner, 1927)	+	+			+			[20]
Kolevia bulgarica Georgiev & Glöer, 2015	+	+			+			[20], [22]
AGRIOLIMACIDAE								
Deroceras zilchi Grossu 1969			+			+		[12]
ARGNIDAE								
Agardhiella langaleta Subai 2011			+			Vr_Ir		[12]
Agardhiella macrodonta (P. Hesse 1916)			+				+	[12]
Agardhiella parreyssii (L. Pfeiffer 1848)			+				+	[12]
CHONDRINIDAE								
Chondrina arcadica bulgarica H. Nordsieck 1970			+				/+	[12]

[Table 3. Continued ▼]

[Table 3. Continued ▼]

Taxa	aquatic	stygobites	terrestrial	troglobites	VRE	BGE	BPE	References
Granaria frumentum hungarica (M. von Kimakowicz 1890)			+				/+	[12]
CLAUSILIIDAE								
Alinda biplicata euptychia (Ehrmann 1960)			+				/+	[12]
Alinda vratzatica (Likharev 1972)			+			Vr_Ir		[12]
Bulgarica hiltrudae H. Nordsieck. 1974			+			Vr_Ir		[12]
Bulgarica varnensis (L. Pfeiffer 1848)			+				+	[12]
Macedonica frauenfeldi regia H. Nordsieck 1974			+			/ Vr_Ir	+/+	[12]
Macedonica frauenfeldi sigma (Westerlund 1884)			+				/+	[12]
Macedonica pinteri Sajo 1968			+			Vr_Ir		[12]
Vestia ranojevici (Pavlovic 1912)			+				+	[12]
HELICIDAE								
Cattania balcanica (L. Pfeiffer 1843)			+				+	[12]
Cattania trizona (Rossmässler 1835)			+				+	[12]
Chilostoma pelia (P. Hesse 1912)			+			+		[12]
HELICODONTIDAE								
Lindholmiola pirinensis S.H.F. Jaeckel 1954			+				+	[12]
HYGROMIIDAE								
Candidula rhabdotoides (A. J. Wagner 1928)			+				+	[12]

[Table 3. Continued ▼]

[Table 3. Continued ▼]

Taxa	aquatic	stygobites	terrestrial	troglobites	VRE	BGE	BPE	References
MILACIDAE								
Milax parvulus Wiktor 1968			+			+		[12]
Tandonia serbica (H. Wagner 1931)			+				+	[12]
PRISTILOMATIDAE								
Vitrea neglecta Damjanov & L. Pinter 1969			+				+	[12]
PYRAMIDULIDAE								
Pyramidula cephalonica (Westerlund 1898			+				+	[12]
STROBILOPSIDAE								
Aspasita bulgarica Subai & Dedov 2008			+			Vr_Ir		[12]
CRUSTACEA	**2**	**2**	**-**	**-**	**2**	**-**	**-**	
HARPACTICOIDA								
***Elaphoidella balkanica* Apostolov 1992**	**+**	**+**			**+**			[34]
ISOPODA								
***Protelsonia lakatnicensis* (Buresch & Gueorguiev 1962)**	**+**	**+**			**+**			[34]
PSEUDOSCORPIONES	**-**	**-**	**3**	**3**	**3**	**-**	**-**	
Balkanoroncus hadzii Harvey, 1990			+	+	+			[9], [40]

[Table 3. Continued ▼]

[Table 3. Continued ▼]

Taxa	aquatic	stygobites	terrestrial	troglobites	VRE	BGE	BPE	References
Neobisium (*Heoblothrus*) *beroni* Beier, 1963			+	+	+			[9], [40]
Roncus mahnerti Ćurčić et Beron, 1981			+	+	+			[9], [40]
OPILIONES	**-**	**-**	**2**	**2**	**1**	**1**	**-**	
***Paralola buresi* Kratochvil, 1951**			+	+	+			[9]
***Paranemastoma* (*Buresiolla*) *bureschi* (Roewer, 1926)**			+	+		+		[9]
ARANEAE	**-**	**-**	**7**	**1**	**-**	**3**	**4**	
AGELENIDAE								
Inermocoelotes jurinitschi (Drensky, 1915)			+			+		[13]
Inermocoelotes karlinskii (Kulczyński, 1906)			+				+	[13]
LINYPHIIDAE								
Antrohyphantes sophianus (Drensky, 1931)			+			+		[13]
Centromerus bulgarianus (Drensky, 1931)			+	+		+		[13]
Centromerus lakatnikensis (Drensky, 1931)			+				+	[13]
Palliduphantes istrianus Kulczyński, 1914			+				+	[13]
ZODARIIDAE								
Zodarion pirini Drensky, 1921			+				+	[13]

[Table 3. Continued ▼]

[Table 3. Continued ▼]

Taxa	aquatic	stygobites	terrestrial	troglobites	VRE	BGE	BPE	References
MYRIAPODA	**-**	**-**	**9**	**5**	**2**	**4**	**4**	
CHILOPODA								
Lithobius illyricus Latzel, 1880			+				+	[42]
Lithobius lakatnicensis Verhoeff, 1926			+	+			+	[42]
DIPLOPODA								
Brachydesmus radewi Verhoeff, 1926			+			+		[42]
Bulgarosoma bureschi Verhoeff, 1926			+	+	+			[42]
Balkanopetalum armatum Verhoeff, 1926			+			+		[42]
Calipodella fasciata (Latzel, 1882)							+	[42]
Typhloiulus bureschi Verhoeff, 1926			+	+		+		[42]
Typhloiulus longipes Strasser, 1973			+	+	+			[42]
Balkanophoenix borisi Verhoeff, 1937			+	+		+		[42]
Pachyiulus cattarensis (Latzel, 1884)			+				+	[42]
ORTHOPTERA	**-**	**-**	**5**	**-**	**-**	**1**	**3/1**	
TETTIGONIIDAE								
Psorodonotus fieberi (Fieber, 1853)			+				+	[41]
Pholidoptera aptera karnyi Ebner, 1908			+				/+	[41]

[Table 3. Continued ▼]

[Table 3. Continued ▼]

Taxa	aquatic	stygobites	terrestrial	troglobites	VRE	BGE	BPE	References
Tettigonia balcanica Chobanov & L-Darcemont, 2014			+				+	[41]
PHANEROPTERIDAE								
Isophya miksici Peshev, 1985			+			+		[41]
Ancistrura nigrovittata (Brunner von Wattenwyl, 1878)			+				+	[41]
COLEOPTERA: Carabidae	**-**	**-**	**23**	**12**	**8/5**	**1/2**	**2/7**	
Carabus (*Tachypus*) *cancellatus intermedius* Dejean, 1826			+				/+	[44]
Carabus (*Trachycarabus*) *scabriusculus bulgarus* Lapouge, 1908			+				/+	[44]
Carabus (*Megodontus*) *violaceus azuresens* Dejean, 1826			+				/+	[44]
Cychrus semigranosus balcanicus Hopffgarten, 1881			+				/+	[44]
Pheggomisetes bureschi (Knirsch, 1923)			+	+	+			[44]
Pheggomisetes globiceps georgievi Z. Karaman, 1958			+	+	/+		+/	[44]
Pheggomisetes globiceps lakatnicensis Jeannel, 1928			+	+	/+			[44]
Pheggomisetes globiceps mladenovi V.B. Guéorguiev, 1964			+	+	/+			[44]
Pheggomisetes globiceps stoicevi V. B. Guéorguiev, 1964			+	+	/+			[44]
Pheggomisetes radevi radevi Knirsch, 1924			+	+	+/+			[44]
Pheggomisetes radevi ilchevi Knirsch, 1924			+	+	+			[44]
Pheggomisetes radevi tranteevi V. B. Guéorguiev, 1964			+	+	+			[44]
Duvalius (Paraduvalius) beroni V. B. Guéorguiev, 1971			+	+	+			[44]

[Table 3. Continued ▼]

[Table 3. Continued ▼]

Taxa	aquatic	stygobites	terrestrial	troglobites	VRE	BGE	BPE	References
Duvalius (Paraduvalius) papasoffi (Mandl, 1942)			+	+	+			[44]
Duvalius (Paraduvalius) zivkovi (Knirsch, 1925)			+	+	+			[44]
Pterostichus (Parahaptoderus) vecors Tschitschérine, 1897			+			+		[44]
Pterostichus (*Morphnosoma*) *melanarius bulgaricus* (Lutshnik, 1915)			+			/+		[44]
Pterostichus (*Feronidius*) *melas depressus* (Dejean, 1828)			+				/+	[44]
Pterostichus (*Pterostichus*) *bruckii* Schaum, 1859			+				+	[44]
Pterostichus (*Rambousekiella*) *ledenikensis* (Knirsch, 1925)			+	+	+			[44]
Molops (*Molops*) *alpestris kalofericus* Mlynář, 1977			+			/+		[44]
Molops (*Molops*) *piceus bulgaricus* Mařan, 1938			+				/+	[44]
Tapinopterus (*Tapinopterus*) *cognatus winkleri* Mandl, 1936			+				/+	[44]
TRICHOPTERA	**-**	**-**	**1**	**-**	**-**	**-**	**1**	
Odontocerum hellenicum Malicky, 1972			+				+	[16]
LEPIDOPTERA	**-**	**-**	**2**	**-**	**-**	**-**	**/2**	
Zerynthia cerisy ferdinandi (Stichel, 1907)			+				/+	[48]
Euchloe ausonia graeca (Verity, 1925)			+				/+	[48]

[Table 3. Continued ▼]

[Table 3. Continued ▼]

Taxa	aquatic	stygobites	terrestrial	troglobites	VRE	BGE	BPE	References
DIPTERA	**-**	**-**	**2**	**-**	**1**	**-**	**1**	
MYCETOPHILIDAE								
Ectrepesthoneura ledenikiensis Bechev, 1988			+				+	[7]
Acnemia vratzatica Bechev, 1985			+		+			[7]
MAMMALIA	**-**	**-**	**1**	**-**	**-**	**-**	**/1**	
Mustela nivalis galinthias (Bate, 1905)			+				/+	
Total	**6**	**6**	**79**	**23**	**21/5**	**19/2**	**27/16**	

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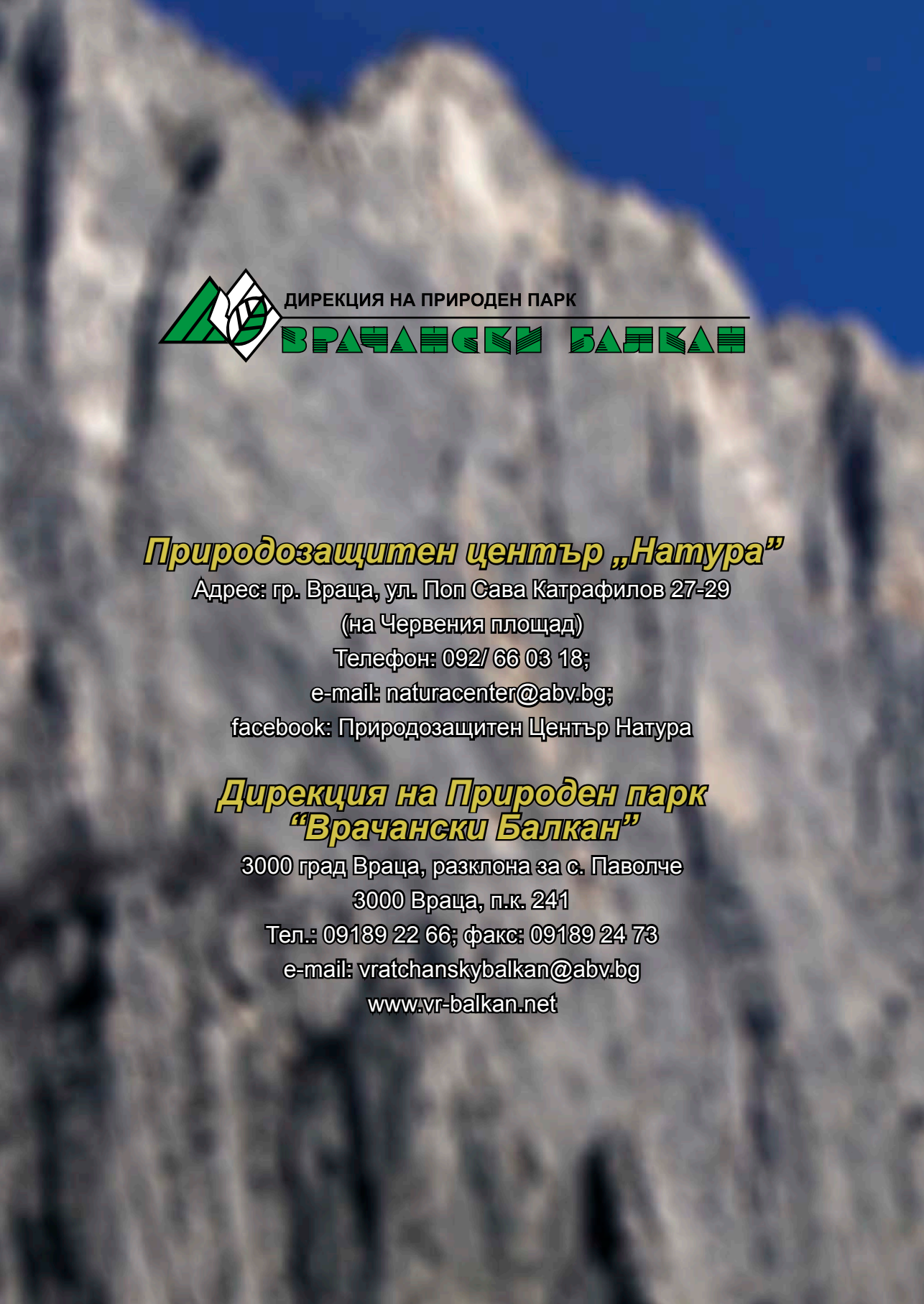
Фаунистично разнообразие на Природен парк Врачански Балкан – обобщение

Димитър Бечев, Дилян Георгиев

(Резюме)

Обобщени са данните за фаунистичното разнообразие на Природен парк Врачански Балкан. В първата и втората част на изданието са включени данни за 2290 вида животни от Природен парк Врачански Балкан и още 81 от Врачанска планина, извън границите на парка. От тях 348 вида са нови за парка и планината, 354 вида са с консервационна значимост.

Локални ендемити за парка са 21 вида и 5 подвида, 19 вида и 2 подвида са български ендемити и 27 вида и 16 подвида балкански ендемити . Почти всички от локалните ендемити (20 вида и 5 подвида) са троглобионти (14 вида) и стигобионти (6 вида). Голяма част от троглобионтните ендемити са също и preglacal relicts, e.g. *Sphaeromides bureschi* and *Tricyphoniscus bureschi* (Crustacea: Isopoda), *Paralola buresi* (Opiliones), *Trachysphaera lakatnicensis* (Mydiapoda: Diplopoda), *Centromerus bulgarianus* (Aranei) и др.



ДИРЕКЦИЯ НА ПРИРОДЕН ПАРК

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