

Spiders from the Vrachanska Planina Mountains (Arachnida: Araneae)

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

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

Introduction

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 This review is a critical incorporation of the available literature data and records unpublished due to sporadic research in the last 70 years.

Material and Methods

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

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

No	Locality	Latitude	Longitude	Date	Leg & Publication
1	Vratsa Town - surroundings	43.1972	23.5518	16.08.1962	Drensky, (1936); P. T., S. L.
2	Vratsa Town, Vratsata place	43.1918	23.5340	02.05.1998	Drensky, (1936); S. L.
3	Zgorigrad, Vratsa district	43.1830	23.5236	16.08.1949	P. T.
4	Ledenika Cave, Vratsa Town	43.2045	23.4934		Drensky, (1936); Deltshev (1970); Deltshev (1982)
5	Reznyovete Cave, Vratsa Town	43.2001	23.4876		Drensky (1936); Deltshev (1970)
6	Zmeyova Dupka Cave, Vratsa Town	43.2447	23.4361		Deltshev (1970)
7	Zmeyova Dupka II Cave, Vratsa Town	43.2419	23.4445		Deltshev (1972b)
8	Garvanets Cave, Vratsa Town	43.1943	23.4960		Deltshev (1982)
9	Sipo Cave, Vratsa Town	43.2346	23.4442		Deltshev (1972b)
10	Toshova Dupka Cave, Beli Izvor Village	43.2649	23.3466		Deltshev (1972)
11	Mecha Dupka Cave, Lyutadzhik Village	43.1879	23.4157		Deltshev (1972a)
12	Sokolska Dupka Cave, Lyutadzhik Village	43.1902	23.4223		Deltshev (1972a); Deltshev (1973a)
13	Vratnik Cave, Lyutadzhik Village	43.1847	23.4199		Deltshev (1973b)
14	Belyara Cave, Vratsa Town	43.2240	23.4544		Deltshev (1972); 1973a)
15	Barkite Cave, Vratsa Town	43.2215	23.4583		Deltshev (1988)
16	Ludoto Ezero Cave, Vratsa Town	43.1664	23.5611	29.10.1973	P. B
17	Haydushka Dupka Cave, Bistréts Village	43.2236	23.5022		Deltshev (1980)
18	Artificial gallery, Gorna Bela Rechka Vill.	43.1825	23.3601		Deltshev et al (2003)
18	Varteshkata Cave, Zverino Village	43.1412	23.5560		Deltshev (1982)
19	Propast 8 Cave, Zverino Village	43.0836	23.5634		Deltshev (1970)
20	Studenata Dupka Cave, Cherepish Village	43.0995	23.6043		Drensky (1936); Deltshev (1972a)
21	Serapionovata Cave, Cherepish Village	43.1008	23.6139		Drensky (1936)
22	Cherepish Monastery, Cherepish Village	43.0937	23.6159		Drensky (1936)
23	Artificial gallery, Gorna Bela Rechka Vill.	43.1857	23.3578		Deltshev et al. (2003)
24	Druzhevo Vill. - surroundings	43.1369	23.3619	14.07.1949	P. T.
25	Milanovo Vill. - surroundings	43.1237	23.3954	06.07.1948	P. T.
26	Radyova Yama Cave, Milanovo Vill.	43.1316	23.4079		Deltshev (1988)
27	Lakatnik rocks - surroundings	43.0884	23.383		P. D.
28	Yamata Cave, Chelopek Vill.	43.1357	23.5787		Deltshev (1970)
29	Eliseyna 9 surroundings	43.0808	23.4863	14.06.2005	M. T.
30	Temnata Dupka Cave, Lakatnik	43.0889	23.3848		Drensky, (1936)
31	Razhishkata Dupka Cave, Lakatnik	43.0900	23.3850		Drensky, (1936)
32	Svinskata Dupka Cave, Lakatnik	43.0883	23.3717		Deltshev et al. (2003)

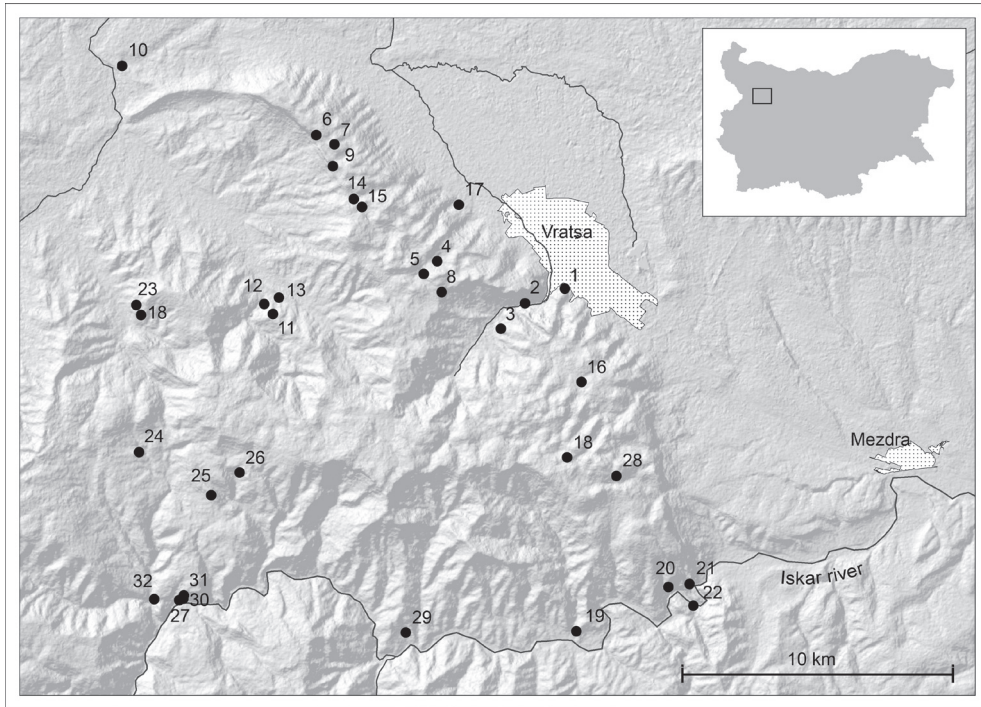


Fig. 1. Localities where the spiders were collected.

Results and Discussion

Species composition

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

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

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

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

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

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

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

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

Notes on species of conservation significance

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

Endemic species

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

Rare species

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

Indicator species

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

Areas and habitats of high conservation value for the group

Caves and Karst areas have high conservation value, characterized by high biodiversity and are refuges for the survival of invertebrate fauna. Vrachanska Mts. is among the richest in caves and cave fauna areas of the country and it is necessary to pay special attention to the development of specific conservation measures. Two main areas are outlined in this respect.

- The area of the reserve Vrachanski Karst, where the spiders greatest conservation value have the caves Ledenika (*Antrohyphantes sofianus*, *Lepthyphantes centromeroides*, *Porrhomma convexum*, *Meta menardi*) and Belyar (*Centromerus bulgarianus*).
- The area of Lakatnik and the caves Temnata Dupka (*Antrohyphantes sofianus*, *Lepthyphantes centromeroides*, *Porrhomma convexum*, *Meta menardi*, *Metellina merianae*) and Razhishkata Dupka (*Centromerus bulgarianus*, *C. lakatnikensis*, *Porrhomma convexum*) are caves with rich invertebrate fauna.

Conclusions

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

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Паяци от Врачанска планина (Arachnida: Araneae)

ХРИСТО ДЕЛЧЕВ, СТОЯН ЛАЗАРОВ

(Резюме)

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