

Bats (Mammalia: Chiroptera) in Ponor Special Protection Area (Natura 2000), Western Bulgaria: Species Diversity and Distribution

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Abstract: High diversity of bats was recorded in Ponor Special Protection Area (Ponor SPA). Thirty-five roosts (29 caves, 4 buildings, 1 gallery and 1 tunnel) were surveyed between 1913 and 2013. Twenty-three species (*Rhinolophus blasii*, *R. euryale*, *R. ferrumequinum*, *R. hipposideros*, *Myotis alcaethoe*, *M. bechsteinii*, *M. blythii*, *M. brandtii*, *M. capaccinii*, *M. daubentonii*, *M. emarginatus*, *M. myotis*, *M. mystacinus*, *M. nattereri*, *Nyctalus noctula*, *Pipistrellus pipistrellus*, *Plecotus austriacus*, *P. auritus*, *Barbastella barbastellus*, *Eptesicus serotinus*, *Hypsugo savii*, *Miniopterus schreibersii* and *Vespertilio murinus*) were recorded in Ponor SPA. Habitat heterogeneity, variety of karstic landforms and availability of numerous underground roosts are considered as key reasons for this high diversity. Cave-dwelling species such as *R. ferrumequinum*, *R. hipposideros*, *M. myotis* and *M. blythii* are the most commonly found in the mountain. Maternity colonies were found only for *R. hipposideros*. Breeding of other species was not confirmed in any of the studied roosts in 2011 and 2012. Hibernating individuals of nine species were found in 28 caves. The highest diversity of bats was found during the autumn swarming in Dinevata Peshtera Cave (17 species), Dushnika Cave (14 species), Svinskata Dupka Cave (12 species), Golyamata Balabanova Dupka Cave (11 species) and Travninata Cave (10 species). The richest region is Iskrets – Dobravitsa with 18 species occurring in it.

Keywords: underground roosts, swarming period, conservation of caves.

Introduction

Ponor is a small but well-defined mountain situated at about 50 km north-west of the capital city of Sofia. Geographically, it is a side branch of the Western Stara Planina (Balkan Mountain Range). Since 2005, Ponor has been designated as an Important Bird Area, which in 2007 was approved as a Special Protection Area (SPA) under the EC Bird Directive (Ponor SPA, BG0002005). The core area of the mountain is covered with grasslands surrounded by broadleaf forests of *Fagus moesiaca* above 1,000 m a.s.l., at places mixed with *Carpinus betulus*, oak forests up to 600 m a.s.l., mixed oak-hornbeam forests between 600 and 1,000 m a.s.l., and to a lesser extent with agricultural plots (TZONEV *et al.* 2014; DIMITROV, PETROVA 2014).

Geologically, Ponor Mountain is formed mainly by Triassic and Jurassic limestones and dolomites (HAYDUTOV *et al.* 1995). Variety of karstic landforms are widespread in the region including exposed rock faces, limestone pavements, disappearing streams, blind valleys, complex underground drainage and extensive cavern systems (NEYKOVSKI, STOITSEV 1975). More than 120 caves and potholes are known in this mountain according to the Main Card Index of Caves in Bulgaria maintained by the Bulgarian Federation of Speleology. Biospeleological data are available for 20 of these caves (STOEV *et al.* 2014). The neighbouring mountain massifs such as Vrachanski Balkan, Chepun and Golema Planina are also rich in caves and

abandoned mine galleries, which provides additional roosting opportunities for bats.

Research on bats of Ponor Mountain started over hundred years ago, in 1913, by Academician Ivan Buresch, who is the founder of the systematic speleological surveys in Bulgaria. From the locally famous Dushnika Cave, near Iskrets Village, he reported four species of bats: *Rhinolophus hipposideros*, *Myotis myotis*, *Miniopterus schreibersii* and *Pipistrellus pipistrellus* (BURESCH 1917). Further surveys carried on bats in caves between 1940 and 1990 added *Rhinolophus ferrumequinum*, *R. blasii*, *Myotis blythii* and *Plecotus austriacus* (BURESCH 1941, BERON 1959, 1963, 1964, 1968; BERON, KOLEBINOVA 1964; BERON, GUÉORGUIEV 1967; GUÉORGUIEV, BERON 1962; HŪRKA 1965; KVARTIRNIKOV 1956, 1957; YANCHEV, STOYKOVA 1973). Recent contributions raised the number of bat species from 8 to 21 by adding new records from previously unexplored caves (PANDURSKA, BESHKOV 1998; PANDURSKA *et al.* 1999; POPOV, IVANOVA 2002; BENDA *et al.* 2003).

Besides summarising all published records of bats found on the territory of Ponor SPA, our study adds many new original records, reports two new species for the region and broadens the knowledge on the seasonal occurrence and local distribution of all species.

Materials and Methods

The study region encompasses the territory of Ponor SPA, which covers 31,379.9 ha. Considering that bats are flying mammals, which frequently switch between a set of alternative roosts, we included records from a few adjacent bat caves, which are situated near the borders of the SPA.

Bats were caught by hand from their roosts or by using polyester mist-nets (mesh size 16 mm, lengths of 3, 6, 8, 10 or 12 m) placed at the entrances of caves and disused mine galleries. Data on the species composition and the seasonal occurrence of bats in five caves, i.e. Dinevata Peshtera, Dushnika, Travninata, Golyamata Balabanova Dupka and Svinskata Dupka, were collected in the course of numerous field checks and mist-netting nights carried between 1990 and 2012.

Identification of species and reference points of the body measurements (taken by us with a plastic caliper) follow the field-guide by DIETZ, VON HELVERSEN (2004). Field discrimination of livemouse-eared bats *Myotis myotis* and *M. blythii* was based on measurements of their upper teeth row (CM^3) and forearm length (FA). Specimen with $CM^3 > 9.5\text{mm}$ and $FA > 62\text{mm}$ were considered as *M. myotis*. Specimen

with $CM^3 < 9.5\text{mm}$ and $FA < 62\text{mm}$ were considered as *M. blythii*.

Records of non-professional bat researchers (biologists, cavers, etc.) were considered if their photographs and morphological descriptions allowed precise identification to the species level. Data from the literature were summarized and presented in the list of localities for each species. Original records are given separately. The geographic positions of 31 bat roosts were taken by GPS receivers (Garmin, Olathe, Kansas). Coordinates of four roosts (Tsurkveto Cave, Podmola Cave, Mecha Polyana Cave and Zaskogova Yama Cave) were precisely taken using a georeferenced Google Earth map.

All surveys after 2005 were conducted under Licenses №61/18.04.2006, 193/1.04.2009; 412/14.07.2011 and 455/20.04.2012 issued by the Ministry of Environment and Waters. All bat records are presented in Annex 1. All roosts ($n=35$) mentioned in the text are listed in Annex 2 and a map of their position is shown in Figure 1.

Results

Extremely high species diversity of bats was recorded in Ponor Mountain. At only 0.28% of the country's territory, altogether 23 species were identified out of 33 species recorded for Bulgaria (cf. BENDA *et al.* 2003). Bats were discovered in 35 roosts situated between 450 m and 1430 m a.s.l. (Annex 1; Annex 2). Data on bats from nine roosts are recorded for the first time.

Species occurrence

Considering the great number of underground roosts, the most common species found in the region belonged to the cave-dwelling bats. *Rhinolophus hipposideros* was found in 86% of the roosts ($n=30$), *R. ferrumequinum* in 54% of the roosts ($n=19$), *Myotis myotis* in 34% ($n=12$) and *M. blythii* in 31% ($n=11$) of the surveyed 35 roosts (Table 1). Forest-dwelling bats such as *Barbastella barbastellus*, *M. bechsteini*, *Nyctalus noctula* and *Pipistrellus pipistrellus* were relatively rarely captured or discovered, considering the greater number of their records known in the neighbouring areas (cf. BENDA *et al.* 2003). The rarest bats in Ponor Mountain were *R. blasii* and *R. euryale*, with just one record each.

Bat Roosts and Seasonal Occurrence

Underground roosts (29 caves, 1 mine gallery and 1 tunnel) formed the majority of the surveyed roost types (Table 2). No bats were found in tree hollows, under bark, or in rocky fissures. Only four summer records of *R. hipposideros* came from buildings.

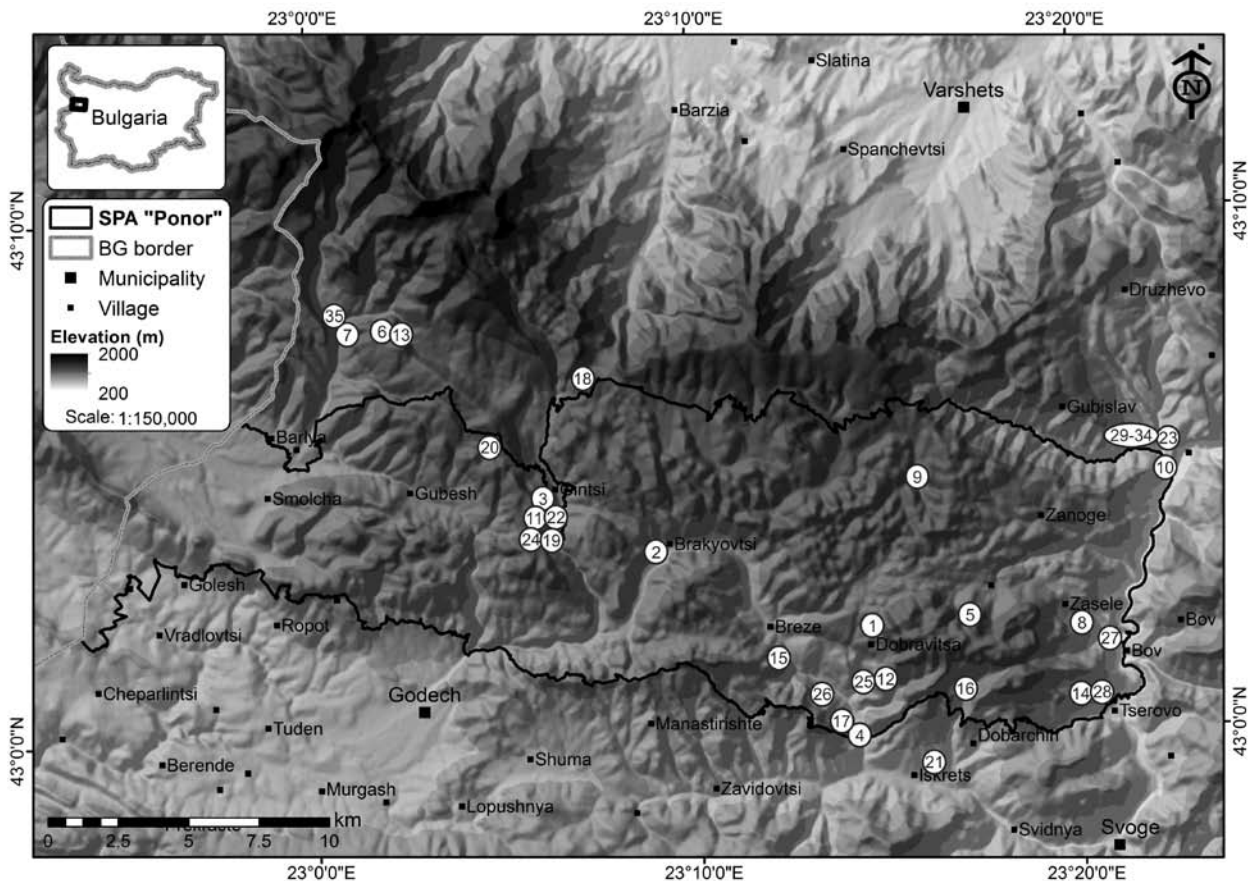


Fig. 1. Localities of bats in Ponor Special Protection Area. Number of each locality is presented in Annex 2

Vodnata Peshtera above Tserovo village was the only known underground maternity roost in Ponor SPA. A mixed breeding colony of *Myotis myotis/blythii*, *M. capaccinii* and *Miniopterus schreibersii* had been known there since the early 1940's (cf. BURESCH 1941). The latter colony was last confirmed in June 1997 by PANDURSKA, BESHKOV (1998). Only a small, non-reproductive colony of about 45 individuals of *Myotis myotis/blythii* was observed by us on 31 May 2012. Small maternity colonies of *R. hipposideros* were found in a house basement in Dobravitsa village and on the roof of Zastavata near the village of Komshtitsa. No maternity roosts of other species were recently discovered though many reports of speleologists were checked in the last years.

Over 80% of the roosts were used for hibernation and at least nine species were discovered in caves between December and March. Swarming activity was recorded at 15 roosts. The complex of Vrazhite Dupki Caves, Dinevata Peshtera and Dushnika Caves are the most important transitional roosts, which are used in April and/or September by dispersing colonies of up to 1300 individuals of *Miniopterus schreibersii*.

In 12 (34%) of the roosts, only one species of bats was found. As a rule, higher species diversity (>5 species) was found in those caves, where mist-netting was carried at least once during the swarming period (from the late August till early October). The highest diversity of bats was found in Dinevata Peshtera Cave (17 species), Dushnika Cave (14 species), Svinskata Dupka Cave (12 species), Golyamata Balabanova Dupka Cave (11 species) and Travninata Cave (10 species). The number of species recorded for each of these sites was primary due to higher research effort there in comparison with few visits carried in the other studied sites.

Local species richness

Four regions in Ponor SPA hold high species diversity of bats at local level (Table 3). The local richness was certainly due to a combination of great roost availability, proper environmental conditions and higher research activity.

Discussion

The territory of Ponor SPA has not been evenly surveyed for bats. The majority of the records come

Table 1. Species composition of bats in Ponor Special Protection Area sorted by their relative occurrence.

Species	Number of Localities	Relative Share (%)	MIN Altitude (m)	MAX Altitude (m)
<i>Rhinolophus hipposideros</i>	30	86	450	1430
<i>Rhinolophus ferrumequinum</i>	19	54	450	1365
<i>Myotis myotis</i>	12	34	450	1365
<i>Myotis blythii</i>	11	31	473	1365
<i>Plecotus austriacus</i>	10	29	450	1285
<i>Miniopterus schreibersii</i>	9	26	450	1099
<i>Eptesicus serotinus</i>	7	20	450	1285
<i>Myotis emarginatus</i>	5	14	450	1285
<i>Myotis mystacinus</i>	5	14	450	1285
<i>Myotis nattereri</i>	5	14	568	1099
<i>Myotis bechsteinii</i>	4	11	450	1280
<i>Plecotus auritus</i>	4	11	1005	1285
<i>Hypsugo savii</i>	3	9	450	1080
<i>Myotis capaccinii</i>	3	9	540	1080
<i>Myotis daubentonii</i>	3	9	1080	1285
<i>Pipistrellus pipistrellus</i>	2	6	450	568
<i>Myotis brandtii</i>	2	6	1080	1285
<i>Vespertilio murinus</i>	2	6	1080	1099
<i>Barbastella barbastellus</i>	1	3	613	613
<i>Myotis alcathoe</i>	1	3	520	520
<i>Nyctalus noctula</i>	1	3	568	568
<i>Rhinolophus blasii</i>	1	3	450	450
<i>Rhinolophus euryale</i>	1	3	450	450

from the marginal parts of the region. Some roosts have been visited 10 to 15 times over a period of 50–80 and more years, whereas other have remained surveyed only once in the recent times. The periphery of the studied region remains much better surveyed compared to the core of the mountain. Only a few caves (e.g. Katsite, Elata) have occasionally been surveyed within the central parts of the SPA boundaries. The species composition and the habitat use within the open grassland areas at higher altitudes remain virtually poorly known.

The relative rarity of some bat species (e.g. *Barbastella barbastellus*, *Nyctalus noctula*, *Pipistrellus pipistrellus*, *Hypsugo savii*, etc.) is presumably due to the low research efforts carried within their best roosting and foraging habitats, such as the old deciduous and mixed forests, which are quite well represented in the studied region. On the other hand, rarity of *Rhinolophus blasii* and *R. euryale*, found only in Svinskata Dupka Cave, is mainly due to the limited availability of the species most preferred habitats such as lowland river valleys connected with open areas covered with woody vegetation and shrubs (cf. DIETZ *et al.*

2009). The highest diversity of species per site (up to 7–9 per night) has been recorded during mist-netting nights, carried at caves and mines in the swarming period (end of August till beginning of October).

Conservation

All species of bats found in Bulgaria are strictly protected by the national Biodiversity Act (Annex 3). Eleven species found in Ponor SPA are listed in Annex 2 of the Habitat Directive (out of 12 species found in Bulgaria): *Rhinolophus blasii*, *R. euryale*, *R. ferrumequinum*, *R. hipposideros*, *Myotis bechsteinii*, *M. capaccinii*, *M. emarginatus*, *M. blythii*, *M. myotis*, *Barbastella barbastellus* and *Miniopterus schreibersii*. Neither a species Action Plan for bats nor a site (or habitat) Management Plan is yet enforced in the region. One cave, Vodnata Peshtera, is protected as a water supply source for the village of Tserovo. The main entrance is closed with a solid gate, but bats can enter the cave through an alternative, smaller passage. Elata Cave (village of Zimevitsa) is declared as a natural landmark under the Protected Territories Act. Other four bat caves (Zaskogova Yama, Krivata

Table 2. Type and usage of the roosts by bats in Ponor Special Protection Area

Roost type	N	Share		Roost usage	N	Share
Caves	29	83%		Hibernaculum	28	80%
Mine gallery	1	3%		Maternity	3	9%
Tunnel	1	3%		Swarming	15	43%
Building	4	11%		Transitional	11	31%
Total	35			Day Roosts	3	9%

Table 3. Regions with greatest species diversity of bats in Ponor Special Protection Area. Abbreviations of species names are presented in Annex 2

Region	Number of caves	Surveyed caves	Number of species	Species list
Iskrets-Dobravitsa	>14	5	18	Eser, Hsav, Msch, Malc, Mbech, Mbly, Mcap, Memar, Mmyo, Mmys, Mnat, Nnoc, Ppip, Plaus, Plaur, Rhfer, Rhip, Vmur
Gintsi	>17	6	17	Eser, Hsav, Msch, Mbech, Mbly, Mbran, Mcap, Mdaub, Memar, Mmyo, Mmys, Mnat, Plaur, Plaus, Rhfer, Rhip, Vmur
Gara Lakatnik	> 50	8	14	Eser, Hsav, Mbech, Mbly, Memar, Mmyo, Mmys, Msch, Plaus, Ppip, Rhbla, Rheur, Rhfer, Rhip
Komshtitsa	>7	2	11	Eser, Mbech, Mbly, Mbran, Mdaub, Memar, Mmyo, Mmys, Plaur, Plaus, Rhip

Pesht, Svetata Voda and Dinevata Peshtera) are formally protected within the boundaries of the Zaskogo Protected Area near the village of Gintsi. Dinevata Pesthera and Vodnata Peshtera Caves are listed as Important Bat Underground Habitats in the Eurobats Agreement list of the key underground sites in Europe (MITCHELL-JONES 2013).

There is no direct evidence that the species composition and abundance of bats in Ponor SPA is correlated with the observed recent decline in the local cattle breeding and the associated with this change land use practices. There are also no field proofs that the current forest management causes population decline in the local bat populations. However, large-scale clear-cutting, pesticide use, fragmentation of the forest cover and substitution of the mixed and broadleaf forests by coniferous monocultures without any doubt lead to decrease in the species diversity and abundance of bats at local and regional scale (cf. MESCHÉDE, HELLER 2000). Human disturbance, excessive caving visits, destruction, partial or full closure of breeding and hibernacula sites were identified as major potential threats, which could affect all species associated with the underground roosts in Ponor Mountain (cf. STOEV *et al.* 2014). Potentially negative for bats are also all underground water catchments, wind turbine construction and quarry expanding projects, which are passed without proper Environmental Impact Assessment and Appropriate Assessment (cf. PETROV 2008).

Further research perspectives

The discovery of new bat roosts, breeding colonies and resolving the occurrence of cryptic species (e.g. *M. mystacinus-brandtii-alcathoe* group) certainly require the involvement of new research approaches (e.g. bat detectors, radio-telemetry, molecular methods). Particularly, all forest habitats and the open landscapes above 1000 m in the core of the mountain are poorly studied. Considering that data from bat detector surveys in Ponor SPA boundaries are not published, the present species list of the local bat fauna is certainly not yet fully completed. Species potentially present in the region are also *Nyctalus leisleri*, *Pipistrellus pygmaeus* and *P. nathusii*.

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Annex 1. List of the species of bats and their localities in Ponor Special Protection Area

Localities are sorted by the names of the village. Date format is shown as day/month/year. m(m)= male(s), f(f)= female(s). Data for each roost are summarised in Annex 2.

Family Rhinolophidae***Rhinolophus ferrumequinum* (Schreber, 1774)**

Literature Data: Brakyovtzi [1], unknown locality, 28.04.1965 (Yanchev, Stoykova 1973); Gara Lakatnik, Vrazhite Dupki Caves, 30 ind. (Kvartirnikov 1956; Beron 1958); Gara Lakatnik, Golyamata Vrazha Dupka Cave [2], 4.09.1955 (Beron 1962); idem., 1f, 6.01.1957; idem., 1m, 17.11.1957; idem., 3ff, 1.01.1958; idem., 1m, 1.02.1958; idem., 1m, 2 ind. 16.02.1958; idem., 1m, 1f, 1 ind., 9.11.1958; idem., 1 ind., 23.01.1960; idem., 1 ind., 21.05.1961 (Beron 1963); idem., 1991–1998 (Pandurska, Beshkov 1998); idem., 1f, 3.03.1964 (Benda *et al.* 2003); Gara Lakatnik, Vetrenata Vrazha Dupka Cave [3], 1f, 9.11.1958 (Beron 1963); Gara Lakatnik, Svinskata Dupka Cave [4] (Kvartirnikov 1956); idem., 1f, 1.01.1958; idem. 1f, 16.01.1958; idem., 21.05.1961 (Beron 1963); idem., 27.10.1963 (Beron, Kolebinova 1964); 1991–1998 (Pandurska, Beshkov 1998); idem., 2f, 21.12.1979; idem., 1 ind., 16.12.2002 (Benda *et al.* 2003); Ginsti, Svetata Voda Cave [5], 16.07.1960 (Guéorguiev, Beron 1962); 1991–1998 (Pandurska, Beshkov 1998); Gintsi, Dinevata Peshtera Cave [6], 5.10.1959 (Guéorguiev, Beron 1962); idem., 24.10.1967, 30.10.1967, 15.11.1968 (Yanchev, Stoykova 1973); idem., 1991–1998 (Pandurska, Beshkov 1998); idem., (Pandurska *et al.* 1999); idem., 3mm, 11.09.1979; idem., 15 ind., 11.10.1997; idem., 1 ind., 18.01.1998 (Benda *et al.* 2003); Gintsi, Krivata Pesht Cave [7], 30.10.1967 (Yanchev, Stoykova 1973); Iskrets, Dushnika Cave [9], 1991–1998 (Pandurska, Beshkov 1998); idem., (Guéorguiev, Beron 1962); Tserovo, Vodnata Peshtera Cave [10], 4 ind., 15.03.1997 (Benda *et al.* 2003); Malkata Vodna Peshtera (Yamata) Cave [11], 25.09.1960 (Guéorguiev, Beron 1962); Zimevitsa, Elata Cave [12], 4.12.1960 (Guéorguiev, Beron 1962); idem., 1991–1998 (Pandurska, Beshkov 1998).

Original Data: Breze, Marina Dupka Cave [13], 2 ind., 3.10.2011, V. Karadakov, I. Alexandrova, T. Georgieva; Dobravitsa, Travninata Cave [14], 1 ind., 1.10.2010, B. Petrov, V. Karadakov, N. Toshkova, I. Alexandrova, V. Zhelyazkova; Gara Lakatnik, Vrazha Dupka 13 [15], 1 ind., 2.10.2011, V. Karadakov, I. Alexandrova; Gara Lakatnik, Vrazha Dupka 15 [16], 20 ind., 2.10.2011, V. Karadakov, I. Alexandrova; Gara Lakatnik, Vrazha Dupka 8 [16], 1 ind., 2.10.2011, V. Karadakov, I. Alexandrova; Gara Lakatnik, Vrazha Dupka 9 [2], 2 ind., 2.10.2011, V. Karadakov, I. Alexandrova; idem., 1 ind., 24.03.2012, V. Karadakov, T. Georgieva; Gara Lakatnik, Kozarskata Peshtera Cave [17], 2ff, mist-net, 1.10.2011, V. Karadakov, I. Alexandrova; idem., 1m, 24.03.2012, V. Karadakov, T. Georgieva; Gara Lakatnik, Svinskata Dupka Cave [4], 1m, 23.07.1999, B. Petrov; idem., 1m, 7.10.2000, B. Petrov, V. Beshkov; idem., 4 ind., 19.04.2006, B. Petrov, T. Stoyanov; idem., 2 ind., 13.12.2007, B. Petrov; idem., 1m, 3.11.2010, B. Petrov; idem., 4 ind., 24.03.2012, V. Karadakov, T. Georgieva; Gintsi, Dinevata Peshtera Cave [6], 12 ind., 14.02.2010, K. Stoichkov *et al.*; Iskrets, Galeria 5, Mina Otechestvo [18], 3mm, mist-net, 2.10.2011, B. Petrov, I. Alexandrova; Iskrets, Dushnika Cave [9], 2 ind., 29.04.2005, B. Petrov; Tserovo, Malkata Vodna Peshtera (Yamata) Cave [11], 1 ind., 31.05.2012, V. Karadakov, I. Alexandrova.

***Rhinolophus hipposideros* (Bechstein, 1800)**

Literature Data: Breze, Tsurkvishte Cave [1], 14.12.1957 (Guéorguiev, Beron 1962); Dobravitsa, Travninata Cave [2], 1991–1998 (Pandurska, Beshkov 1998); Gara Lakatnik, Svinskata Dupka Cave [3], 24.01.1955 (Guéorguiev, Beron 1962); idem., 1 ind., 6.01.1957; 1 ind., 1.01.1958; 1 ind., 31.01.1958; 1 ind., 16.02.1958; 1m, 5.11.1961; 1m, 4.03.1962 (Beron 1963); Gara Lakatnik, Kozarskata Peshtera Cave [4], 6.01.1956 (Guéorguiev, Beron 1962); Gara Lakatnik, Golyamata Vrazha Dupka Cave [5], 9.11.1958 (Guéorguiev, Beron 1962); idem., 1991–1998 (Pandurska, Beshkov 1998); Gintsi, Krivata Pesht Cave [6], 6.02.1959 (Beron 1962), idem., 1991–1998 (Pandurska, Beshkov 1998); Gintsi, Svetata Voda Cave [7], 5.12.1960 (Guéorguiev, Beron 1962); idem., 16.11.1963 (Kolebinova, Beron 1965); idem., 1991–1998 (Pandurska, Beshkov 1998); Gintsi, Dinevata Peshtera Cave [8], 2mm, 1f, 22.09.1991 (Pandurska *et al.* 1999); idem., 1m, 11.09.1979; idem., 1m, 19.06.1992; idem., 1f, 18.04.1993; idem., 2 ind., 11.10.1997; idem., 34 ind., 18.01.1998 (Benda *et al.* 2003); Gintsi, Petrohan Pass [9], building, 15 ind., 15.03.1998 (Benda *et al.* 2003); Gintsi, Sagaroto Cave [10], 100 ind., 13.12.1998 (Benda *et al.* 2003); Gintsi, Toshova Dupka Cave (= Zaskogova Yama Cave?) [11], 1m, 17.02.1968 (Benda *et al.* 2003); Iskrets, Mechata Dupka Cave (= Mecha Polyana) [12], 1991–1998 (Pandurska, Beshkov 1998); Iskrets, Dushnika Cave [13], 1m, 28.02.1913 (Buresch 1917); idem., 1991–1998 (Pandurska, Beshkov 1998); idem., 3.01.1925 (Benda *et al.* 2003); Komshtitsa, Golyamata Balabanova Dupka Cave [14], 27.04.1966 (Beron, Guéorguiev 1967); idem., 1991–1998 (Pandurska, Beshkov 1998); Zimevitsa, Elata Cave [15], 4.12.1960 (Guéorguiev, Beron 1962); idem., 1991–1998 (Pandurska, Beshkov 1998); Zimevitsa, Katsite Cave [16], 11.12.1960 (Beron, Guéorguiev 1967).

Original Data: Breze, Marina Dupka Cave [17], 10 ind., 3.10.2011, V. Karadakov, I. Alexandrova, T. Georgieva; Dobravitsa, Basement of a house [18], 10 ind. in a breeding colony, June–August 2000–2011, B. Barov; Dobravitsa, Krushushnitsa Cave [19], 1m, 1f, mist-net, 2.10.2011, V. Karadakov, T. Georgieva; Dobravitsa, Travninata Cave [2], 7 ind. (2mm, 1f), mist-net, 17.04.2010, B. Petrov, V. Zhelyazkova, N. Toshkova, V. Karadakov, T. Georgieva; idem., 4 ind., mist-net, 1.10.2010, B. Petrov, V. Karadakov, N. Toshkova, I. Alexandrova, V. Zhelyazkova; Gara Lakatnik, Kozarskata Peshtera Cave [4], 3 ind., 3.11.2010, B. Petrov *et al.*; idem., 1m, mist-net, 1.10.2011, V. Karadakov, I. Alexandrova; idem., 2m, 24.03.2012, V. Karadakov, T. Georgieva; Gara Lakatnik, Svinskata Dupka Cave [3], 1 ind., 7.10.2000, B. Petrov, V. Beshkov; idem., 10 ind., 11.12.2002, B. Petrov; idem., 15 ind., 19.04.2006, B. Petrov, T. Stoyanov; idem., 12 ind., 13.12.2007, B. Petrov; idem., 20 ind., 24.03.2012, V. Karadakov, T.

Georgieva; Gara Lakatnik, Vrazha Dupka 13 [20], 1 ind., 2.10.2011, V. Karadakov, I. Alexandrova; Gara Lakatnik, Vrazha Dupka 15 [21], 2 ind., 2.10.2011, V. Karadakov, I. Alexandrova; Gara Lakatnik, Vrazha Dupka 4 [22], 1 ind., 2.10.2011, V. Karadakov, I. Alexandrova; Gara Lakatnik, Vrazha Dupka 7 [23], 1 ind., 2.10.2011, V. Karadakov, I. Alexandrova; idem., 1 ind., 24.03.2012, V. Karadakov, T. Georgieva; Gara Lakatnik, Vrazha Dupka 8 [24], 2 ind., 2.10.2011, V. Karadakov, I. Alexandrova; Gara Lakatnik, Vrazha Dupka 9 [5], 8 ind., 2.10.2011, V. Karadakov, I. Alexandrova; idem., 5 ind., 24.03.2012, V. Karadakov, T. Georgieva; Gintsi, Dinevata Peshtera Cave [8], 65 ind., 14.02.2010, K. Stoichkov *et al.*; Iskrets, small tunnel in Sanatoriuma [25], 18.04.2010, 7 ind., visual count, B. Petrov, V. Zhelyazkova, N. Toshkova, V. Karadakov, T. Georgieva, S. Velkova; Iskrets, Galeria 5, Mina Otechestvo [26], 6mm, mist-net, 2.10.2011, B. Petrov, I. Alexandrova; Iskrets, Dushnika Cave [13], 3 ind. 29.04.2005, B. Petrov; Komshtitsa, Golyamata Balabanova Dupka Cave [14], 1m, 5.09.2011, B. Petrov, N. Toshkova; Komshtitsa, Granicharskata Propast Cave [27], 5mm, mist-net, 5.09.2011, V. Zhelyazkova; Komshtitsa, Zastava Komshtitsa [28], building, 20 ind., 6.09.2011, V. Zhelyazkova; Tserovo, Vodnata Peshtera Cave [29], 1 ind., 31.05.2012, B. Petrov, N. Toshkova; Tserovo, Malkata Vodna Peshtera (Yamata) Cave [30], 1 ind., 31.05.2012, V. Karadakov, I. Alexandrova.

***Rhinolophus blasii* Peters, 1866**

Literature Data: Gara Lakatnik, Svinskata Dupka Cave [1], 1.01.1959 (Beron 1962); idem., 1m, 22.02.1995 (cf. Popov, Ivanova 2002).

***Rhinolophus euryale* Blasius, 1853**

Literature Data: Gara Lakatnik, Svinskata Dupka Cave [1], 1m, 23.07.1999 (cf. Popov, Ivanova 2002).

Family Vespertilionidae

***Myotis alcaethoe* von Helversen & Heller, 2001**

Original Data: Iskrets, small tunnel in Sanatoriuma [1], 8.04.2010, 1m freshly died, St. Lazarov leg., B. Petrov det.

***Myotis bechsteinii* (Kuhl, 1817)**

Literature Data: Dobravitsa, Travninata Cave [1], 1m, 15.09.1994 (Pandurska, Beshkov 1998); Gintsi, Dinevata Peshtera Cave [2], 1m, 5.09.1994 (Pandurska *et al.* 1999); Gara Lakatnik, Svinskata Dupka Cave [3], 1m, mist-net, 24.08.1995 (Benda *et al.* 2003).

Original Data: Komshtitsa, Golyamata Balabanova Dupka Cave [4], 1m, mist-net, 5.09.2011, B. Petrov, N. Toshkova.

***Myotis blythii* (Tomes, 1857)**

Literature Data: Gintsi, Dinevata Peshtera Cave [1], 5.12.1959 (Guéorguiev, Beron 1962); idem., 16.11.1963 (Beron 1968); idem., 3 ind., 6.10.1990 (Pandurska *et al.* 1999); Gintsi, Svetata Voda Cave [2], 1991–1998 (Pandurska, Beshkov 1998); Iskrets, Dushnika Cave [3], 1991–1998 (Pandurska, Beshkov 1998); Tserovo, Vodnata Peshtera Cave [4], mixed colony of *M. myotis* and *M. capaccinii*, May–June 1997 (Pandurska, Beshkov 1998); Zimevitsa, Elata Cave [5], 4.12.1960 (Guéorguiev, Beron 1962); idem., 1991–1998 (Pandurska, Beshkov 1998); Zimevitsa, Katsite Cave [6], 11.12.1960 (Beron, Guéorguiev 1967).

Original Data: Dobravitsa, Travninata Cave [7], 8mm, mist-net, 1.10.2010, B. Petrov, V. Karadakov, N. Toshkova, I. Alexandrova, V. Zhelyazkova; Gara Lakatnik, Kozarskata Peshtera Cave [8], 1f, mist-net, 1.10.2011, V. Karadakov, I. Alexandrova; Iskrets, Dushnika Cave [3], 2mm, 29.04.2005, B. Petrov; Komshtitsa, Golyamata Balabanova Dupka Cave [9], 35mm, 1f, mist-net, 5.09.2011, B. Petrov, N. Toshkova; Komshtitsa, Malkata Balabanova Dupka Cave [10], 1f, by hand, 6.09.2011, c/o B. Petrov; Komshtitsa, Granicharskata Propast Cave [11], 2m, 1f, mist-net, 5.09.2011, V. Zhelyazkova; Zimevitsa, Katsite Cave [6], 3 ind., cf. *blythii*, 30.04.2005, B. Petrov; Zimevitsa, Elata Cave [5], 1 ind., 5.09.2010, K. Stoichkov, B. Petrov det.

Large *Myotis myotis/blythii*

Included are observations of large *Myotis* spp., which remained unidentified due to their inaccessibility or to avoid disturbance.

Literature Data: Iskrets, Dushnika Cave [1], 600 ind., summer, 1991–1998 (Pandurska, Beshkov 1998).

Original data: Tserovo, Vodnata Peshtera Cave [2], 45 ind., visual count, 31.05.2012, B. Petrov, N. Toshkova.

***Myotis brandtii* (Eversmann, 1845)**

Literature Data: Gintsi, Dinevata Peshtera Cave [1], 2mm, mist-net, 22.09.1991 (Pandurska *et al.* 1999).

Original Data: Komshtitsa, Golyamata Balabanova Dupka Cave [2], 1f, 29.12.1997, B. Petrov, G. Stoyanov, B. Barov.

***Myotis capaccinii* (Bonaparte, 1837)**

Literature Data: Gintsi, Dinevata Peshtera Cave [1], 1m, 2ff, mist-nets, 22.09.1991 (Pandurska *et al.* 1999); idem., 1m, mist-net, 18.04.1993, T. Ivanova (Benda *et al.* 2003); idem., 200 ind., 11.10.1997; idem., 2 ind., 18.01.1998 (Benda *et al.* 2003); Tserovo, Vodnata Peshtera Cave [2], mixed colony with *M. myotis* and *M. blythii*, May–June 1997 (Pandurska, Beshkov 1998).

Original Data: Iskrets, Dushnika Cave [3], 4 mm, mist-net, 24.07.1999, B. Petrov; idem., 1 m, mist-net, 29.04.2005, B. Petrov.

***Myotis daubentonii* (Kuhl, 1817)**

Literature Data: Gintsi, Krivata Pesht Cave [1], 1 ind., 20.11.1963 (Yanchev, Stoykova 1973); Gintsi, Dinevata Peshtera Cave [2], 1 ind. 23.01.1994 (Pandurska *et al.* 1999).

Original Data: Komshtitsa, Golyamata Balabanova Dupka Cave [2], 1m, mist-net, 5.09.2011, B. Petrov, N. Toshkova.

***Myotis emarginatus* (Geoffroy, 1806)**

Literature Data: Gintsi, Dinevata Peshtera Cave [1], 1m, 4.09.1994, mist-net (Pandurska *et al.* 1999); Iskrets, Dushnika Cave [2], 4ff lactating, 25.06.1998 (Pandurska, Beshkov 1998; Pandurska, 2000); Komshtitsa, Golyamata Balabanova Dupka Cave [3], 1m, 3.09.1994 (Pandurska, Beshkov 1998; Pandurska, 2000).

Original Data: Gara Lakatnik, Svinskata Dupka Cave [4], 1m juv., mist-net, 23.07.1999, B. Petrov; Iskrets, Dushnika Cave [2], 1f, mist-net, 24.07.1999, B. Petrov; Komshtitsa, Golyamata Balabanova Dupka Cave [3], 1m, 5.09.2011, B. Petrov, N. Toshkova; Komshtitsa, Granicharskata Propast Cave [5], 1m, mist-net, 5.09.2011, V. Zhelyazkova.

***Myotis myotis* (Borkhausen, 1797)**

Literature Data: Dobravitsa, Travninata Cave [1], 15.09.1994 (Pandurska, Beshkov 1998); Gara Lakatnik, Svinskata Dupka Cave [2], 1991-1998 (Pandurska, Beshkov 1998); *idem.*, 1f, 11.12.1979 (Benda *et al.* 2003); Gara Lakatnik, Golyamata Vrazha Dupka Cave [3], 1991-1998 (Pandurska, Beshkov 1998); Gintsi, Dinevata Peshtera Cave [4], 5.02.1959 (Guéorguiev, Beron 1962); *idem.*, 1991-1998 (Pandurska, Beshkov 1998); *idem.*, (Pandurska *et al.* 1999); *idem.*, 2ff, 11.09.1979; *idem.*, 2mm, mist-net, 18.04.1993; *idem.*, 13 ind., 18.01.1998 (Benda *et al.* 2003); Gintsi, Podmola Cave [5], 6.02.1959 (Guéorguiev, Beron 1962); Gintsi, Svetata Voda Cave [6], 1991-1998 (Pandurska, Beshkov 1998); Iskrets, Dushnika Cave [7], May 1911 (Buresch 1917); *idem.*, 1991-1998 (Pandurska, Beshkov 1998); Komshtitsa, Golyamata Balabanova Dupka Cave [8], 1991-1998 (Pandurska, Beshkov 1998); *idem.*, 1f, 3.01.1998, G. Stoyanov (Benda *et al.* 2003); Tserovo, Vodnata Peshtera Cave [9], 4 ind., 5.11.1940, (Buresch 1941); *idem.*, mixed colony of *M. blythii* and *M. capaccinii*, May-June 1997 (Pandurska, Beshkov 1998); Zimevitsa, Elata Cave [10], 4.12.1960 (Guéorguiev, Beron 1962, Pandurska, Beshkov 1998).

Original Data: Iskrets, Dushnika Cave [7], 1 m, mist-net, 24.07.1999, B. Petrov; Gara Lakatnik, Svinskata Dupka Cave [2], 4mm, 1f, mist-net, 23.07.1999, B. Petrov; *idem.*, 2 ind., 11.12.2002, B. Petrov; Gintsi, Dinevata Peshtera Cave [4], 2 ind., 14.02.2010, K. Stoichkov, B. Petrov det.; Komshtitsa, Granicharskata Propast [11], 1f, mist-net, 5.09.2011, V. Zhelyazkova; Gara Lakatnik, Kozarskata Peshtera Cave [12], 1m, 1f, mist-net, 1.10.2011, V. Karadakov, I. Alexandrova.

***Myotis cf. mystacinus* (Kuhl, 1817)**

Literature Data: Iskrets, Dushnika Cave [1], 1991-1998 (Pandurska, Beshkov 1998); Komshtitsa, Golyamata Balabanova Dupka Cave [2], 1 ind., 27.04.1966 (Beron, Guéorguiev 1967; *idem.*, 1991-1998 (Pandurska, Beshkov 1998); Gintsi, Dinevata Peshtera Cave [3], 2 ind., 6.10.1990 (Pandurska *et al.* 1999).

Original Data: Gara Lakatnik, Svinskata Dupka Cave [4], 1m, 11.12.2002, B. Petrov; Iskrets, Dushnika Cave [1], 1m, mist-net, 29.04.2005, B. Petrov; Komshtitsa, Golyamata Balabanova Dupka Cave [2], 1m, 1f, 5.09.2011, B. Petrov, N. Toshkova; Komshtitsa, Granicharskata Propast Cave [5], 7mm, 1f, mist-net, 5.09.2011, V. Zhelyazkova.

***Myotis nattereri* (Kuhl, 1817)**

Literature Data: Dobravitsa, Travninata Cave [1], 15.09.1994 (Pandurska, Beshkov 1998); Gintsi, Dinevata Peshtera Cave [2], 1m, mist-net, 22.09.1991 (Pandurska *et al.* 1999); *idem.*, 1991-1998 (Pandurska, Beshkov 1998); Iskrets, Dushnika Cave [3], 1991-1998 (Pandurska, Beshkov 1998).

Original Data: Dobravitsa, Travninata Cave [1], 1m, mist-net, 17.04.2010, B. Petrov, V. Zhelyazkova, N. Toshkova, V. Karadakov, T. Georgieva; *idem.*, 2mm, 6ff, mist-net, 1.10.2010, B. Petrov, V. Karadakov, N. Toshkova, I. Alexandrova, V. Zhelyazkova; Dobravitsa, Krushushnitsa Cave [4], 1m, 1f, mist-net, 2.10.2011, V. Karadakov, T. Georgieva; Iskrets, Galeria 5, Mina Otechestvo [5], 1m, mist-net, 2.10.2011, B. Petrov, I. Alexandrova.

***Nyctalus noctula* (Schreber, 1774)**

Literature Data: Iskrets, Dushnika Cave, 1991-1998 (Pandurska, Beshkov 1998).

***Eptesicus serotinus* (Schreber, 1774)**

Literature Data: Dobravitsa, Travninata Cave [1], 1991-1998 (Pandurska, Beshkov 1998); Komshtitsa, Golyamata Balabanova Dupka Cave [2], 1991-1998 (Pandurska, Beshkov 1998); Gintsi, Dinevata Peshtera Cave [3], 1991-1998 (Pandurska, Beshkov 1998); *idem.*, 1m, 22.09.1991 (Pandurska *et al.* 1999); Iskrets, Dushnika Cave [4], 1991-1998 (Pandurska, Beshkov 1998); Zasele, Karstic niche at Skaklya Waterfall [5], 13.02.2002, 1 subfossil ind. (Benda *et al.* 2003).

Original Data: Dobravitsa, Travninata Cave [1], 1m, mist-net, 17.04.2010, B. Petrov, V. Zhelyazkova, N. Toshkova, V. Karadakov, T. Georgieva; Gara Lakatnik, Svinskata Dupka Cave [6], 2mm, 1f, mist-net, 23.07.1999, B. Petrov; Gara Lakatnik, Kozarskata Peshtera Cave [7], 1m, 2ff, mist-net, 1.10.2011, V. Karadakov, I. Alexandrova; Iskrets, Dushnika Cave [4], 1m, mist-net, 29.04.2005, B. Petrov; Iskrets, Galeria 5, Mina Otechestvo [8], 2ff, mist-net, 2.10.2011, B. Petrov, I. Alexandrova.

***Hypsugo savii* (Bonaparte, 1837)**

Literature Data: Gintsi, Dinevata Peshtera Cave [1], 1991-1998 (Pandurska *et al.* 1999); Iskrets, Dushnika Cave [2], 1991-1998 (Pandurska, Beshkov 1998).

Original Data: Gara Lakatnik, Svinskata Dupka Cave [3], 1m, mist-net, 23.07.1999, B. Petrov.

***Pipistrellus pipistrellus* (Schreber, 1774)**

Literature Data: Gara Lakatnik, Golyamata Vrazha Dupka Cave [1], 24.01.1960 (Guéorguiev, Beron 1962); Iskrets, Dushnika Cave [2] (Buresch 1917); *idem.*, 1 ind., 25.09.1960 (Benda *et al.* 2003).

***Plecotus auritus* (Linnaeus, 1758)**

Literature Data: Dobravitsa, Travninata Cave [1], 1991-1998 (Pandurska, Beshkov 1998); Gintsi, Dinevata Peshtera Cave [2], 2mm, 22.09.1991; *idem.*, 1m, 23.01.1994 (Pandurska *et al.* 1999); Komshtitsa, Golyamata Balabanova Dupka Cave [3], 1991-1998 (Pandurska, Beshkov 1998);

Original Data: Dobravitsa, Travninata Cave [1], 1m, mist-net, 17.04.2010, B. Petrov, V. Zhelyazkova, N. Toshkova, V. Karadakov, T. Georgieva; Dobravitsa, Krushushnitsa Cave [4], 1m, 1f, mist-net, 2.10.2011, V. Karadakov, T. Georgieva; Komshtitsa, Golyamata Balabanova Dupka Cave [3], 1f, 29.12.1997, B. Petrov, G. Stoyanov, B. Barov; *idem.*, 1m, 2ff, 5.09.2011, B. Petrov, N. Toshkova.

***Plecotus austriacus* (Fischer, 1829)**

Literature Data: Dobravitsa, Travninata Cave [1], 1991-1998 (Pandurska, Beshkov 1998); Gara Lakatnik, Vrazhite Dupki Caves [2] (as *P. auritus* in Beron, 1959); Gara Lakatnik, Kozarskata Peshtera Cave [3], 4.01.1957 (as *P. auritus* in Guéorguiev, Beron 1962); Gara Lakatnik, Svinskata Dupka Cave [4], 1m, 5.11.1961; *idem.*, 1m, 4.03.1962 (as *P. auritus* in Beron, 1963); *idem.*, 1 ind., 10.03.1963 (Beron, Guéorguiev 1967); *idem.*, 1991-1998 (Pandurska, Beshkov 1998); *idem.*, 1m, mist-net, 24.08.1995 (Benda *et al.* 2003); *idem.*, 1f, 16.12.2002 (Benda & Ivanova 2003); Gintsi, Dinevata Peshtera Cave [5] (as *P. auritus* in Beron, 1959); *idem.*, 6 ind., mist-nets, 1991-1994 (Pandurska *et al.* 1999); Gintsi, Krivata Pesht Cave [6], 1991-1998 (Pandurska, Beshkov 1998); Iskrets, Dushnika Cave [7], 10.02.1965 (Hůrka 1965); Komshtitsa, Golyamata Balabanova Dupka Cave [8], 1991-1998 (Pandurska, Beshkov 1998).

Original Data: Dobravitsa, Travninata Cave [1], 1m, 1f, mist-net, 1.10.2010, B. Petrov, V. Karadakov, N. Toshkova, I. Alexandrova, V. Zhelyazkova; Dobravitsa, Krushushnitsa Cave [9], 2mm, mist-net, 2.10.2011, V. Karadakov, T. Georgieva; Gara Lakatnik, Svinskata Dupka Cave [4], 1m, 23.07.1999, B. Petrov; Gara Lakatnik, Kozarskata Peshtera Cave [3], 5mm, 1ff, mist-net, 1.10.2011, V. Karadakov, I. Alexandrova; Iskrets, Galeria 5, Mina Otechestvo [10], 5mm, mist-net, 2.10.2011, B. Petrov, I. Alexandrova.

***Barbastella barbastellus* (Schreber, 1774)**

Original Data: Gara Bov, Unnamed small cave, 1m, mist-net, 1.10.2011, B. Petrov, T. Georgieva.

***Vespertilio murinus* Linnaeus, 1758**

Literature Data: Gintsi, Dinevata Peshtera Cave [1], 1m, mist-net, 22.09.1991 (Pandurska *et al.* 1999); *idem.*, 1991-1998 (Pandurska, Beshkov 1998).

Original Data: Dobravitsa, Krushushnitsa Cave [2], 1m, mist-net, 2.10.2011, V. Karadakov, T. Georgieva.

Family Miniopteridae

***Miniopterus schreibersii* (Kuhl, 1817)**

Literature Data: Gara Lakatnik, Golyamata Vrazha Dupka Cave [1], 8.11.1958 (Guéorguiev, Beron 1962); *idem.*, 1f, 24.05.1959 (Beron 1963); Gara Lakatnik, Svinskata Dupka Cave [2], 1991-1998 (Pandurska, Beshkov 1998); Gintsi, Dinevata Peshtera Cave [3], 7 ind., mist-net, 6.10.1990; *idem.*, 2mm, 4ff, mist-net, 22.09.1991; *idem.*, ca. 700 ind., migrating colony, October 1994; *idem.*, ca. 700 ind., migrating colony, October 1995 (Pandurska *et al.* 1999); *idem.*, 24mm, 8ff, by hand, 11.09.1979, V. Vassilev; *idem.*, ca. 1300 ind., migrating colony, 30.09.1990 (Benda *et al.* 2003); Iskrets, Dushnika Cave [4], 28.02.1913 (Buresch 1917); Tserovo, Vodnata Peshtera Cave [5], 10.05.1959 (Guéorguiev, Beron 1962); *idem.*, 1991-1998 (Pandurska, Beshkov 1998).

Original Data: Dobravitsa, Travninata Cave [6], 2mm, mist-net, 17.04.2010, B. Petrov, V. Zhelyazkova, N. Toshkova, V. Karadakov, T. Georgieva; Dobravitsa, Krushushnitsa Cave [7], 1m, 1f, mist-net, 2.10.2011, V. Karadakov, T. Georgieva; Gara Lakatnik, Svinskata Dupka Cave [2], 1m, mist-net, 23.07.1999, B. Petrov; 3mm, 7ff, mist-net, 7.10.2000, B. Petrov, V. Beshkov; 1 ind., 19.04.2006, B. Petrov, T. Stoyanov; ca. 120 ind., photo-count, 7.11.2010, T. Krasteva; Gara Lakatnik, Kozarskata Peshtera Cave [8], 3mm, 1f, mist-net, 1.10.2011, V. Karadakov, I. Alexandrova; Gara Lakatnik, Vrazha Dupka Cave 15 [9], 5 ind., visual count, 2.10.2011, V. Karadakov, I. Alexandrova; Gara Lakatnik, Vrazha Dupka 9 [1], ca. 250 ind., visual count, 2.10.2011, V. Karadakov, I. Alexandrova; 2 ind., visual count, 24.03.2012, V. Karadakov, T. Georgieva; Iskrets, Dushnika Cave [4], ca. 40 ind., 6mm, mist-netted, 29.04.2005, B. Petrov.

Annex 2. Localities of bats in Ponor Special Protection Area recorded between 1913 and 2013

Legend: *Barbastella barbastellus* (Bbar), *Myotis alcahaloe* (Male), *Nyctalus noctula* (Nnoe), *Pipistrellus pipistrellus* (Ppip), *Rhinolophus blasii* (Rhbla), *Myotis brandtii* (Mbran), *Rhinolophus euryale* (Rheur), *Vesperugo murinus* (Vmur), *Hypsugo savii* (Hsav), *Myotis daubentonii* (Mdaub), *Myotis bechsteinii* (Mbech), *Myotis emarginatus* (Memar), *Myotis mystacinus* (Mmyst), *Myotis nattereri* (Mnat), *Plecotus auritus* (Plaur), *Eptesicus serotinus* (Eser), *Miniopterus schreibersii* (Msch), *Plecotus austriacus* (Plaust), *Myotis blythii* (Mbly), *Myotis myotis* (Mmyo), *Rhinolophus ferrumequinum* (Rhfer), *Rhinolophus hipposideros* (Rhhip).

Locality	Village	ALT (m)	Type	Roost status	Number of species	Species	References
Basement of a house	Dobravitsa	830	building	Maternity	1	Rhhip	new data
Brakyovtsi, unknown locality	Brakyovtsi	1000	Building?	?	1	Rhfer	YANCHEV, STOYKOVA (1973)
Dinevata Peshtera Cave	Ginisi	1080	cave	Swarming, Hibernaculum, Transitional	17	Eser, Hsav, Msch, Mbech, Mbly, Mbran, Mcap, Mdaub, Memar, Mmyo, Mmyst, Mnat, Plaur, Plaust, Rhfer, Rhhip, Vmur	BERON (1959), GUÉORGUEV, BERON (1962), PANDURSKA, BESHKOV (1998), PANDURSKA <i>et al.</i> (1999), new data
Dushnika Cave	Iskrets	568	cave	Swarming, Hibernaculum, Transitional	14	Eser, Hsav, Msch, Mbly, Mcap, Memar, Mmyo, Mmyst, Mnat, Nnoe, Ppip, Plaust, Rhfer, Rhhip	BURESCH (1917), HÜRKA (1965), PANDURSKA, BESHKOV (1998), PANDURSKA (2000), BENDA <i>et al.</i> (2003), new data
Elata Cave	Zimevitsa	1365	cave	Hibernaculum	4	Mbly, Mmyo, Rhfer, Rhhip	GUÉORGUEV, BERON (1962), PANDURSKA, BESHKOV (1998), new data
Golyamata Balabanova Dupka Cave	Komshtitsa	1285	cave	Swarming, Hibernaculum, Transitional	11	Eser, Mbech, Mbly, Mbran, Mdaub, Memar, Mmyo, Mmyst, Plaur, Plaust, Rhhip	BERON, GUÉORGUEV (1967), PANDURSKA, BESHKOV (1998), PANDURSKA (2000), BENDA <i>et al.</i> (2003)
Granicharskata Propast Cave	Komshtitsa	1050	cave	Swarming, Hibernaculum	5	Mbly, Memar, Mmyo, Mmyst, Rhhip	new data
Karstic niche at Skaklya Waterfall	Zasele	860	cave	Day roost	1	Eser	Benda <i>et al.</i> (2003)
Katsite Cave	Zimevitsa	1244	cave	Hibernaculum	2	Mbly, Rhhip	BERON, GUÉORGUEV (1967), PANDURSKA, BESHKOV (1998), new data
Kozarskata Peshtera Cave	Gara Lakatnik	473	cave	Swarming, Hibernaculum	7	Eser, Msch, Mbly, Mmyo, Plaust, Rhfer, Rhhip	BERON (1959), GUÉORGUEV, BERON (1962), new data
Krivata Pesth Cave	Ginisi	1100	cave	Hibernaculum	4	Plaust, Rhfer, Rhhip, Mdaub	BERON (1963), YANCHEV & STOYKOVA (1973), PANDURSKA, BESHKOV (1998)
Krushushnitsa Cave	Dobravitsa	1099	cave	Swarming, Hibernaculum	6	Msch, Mnat, Plaur, Plaust, Rhhip, Vmur	new data
Malkata Balabanova Dupka Cave	Komshtitsa	1315	cave	Hibernaculum	1	Mbly	new data
Malkata Vodna Peshtera (Yamata) Cave	Tserovo	648	cave	Hibernaculum	2	Rhfer, Rhhip	GUÉORGUEV, BERON (1962), new data
Marina Dupka Cave	Breze	969	cave	Hibernaculum	2	Rhfer, Rhhip	new data
Mecha Polyana Cave	Iskrets	1000	cave	Hibernaculum	1	Rhhip	PANDURSKA, BESHKOV (1998)
Mina Otechestvo, Galeria 5	Iskrets	689	mine	Swarming, Hibernaculum	5	Eser, Mnat, Plaust, Rhfer, Rhhip	new data

Annex 2. Continued

Locality	Village	ALT (m)	Type	Roost status	Number of species	Species	References
Petrochan pass, building	Gintisi	1430	building	?	1	Rhip	BENDA <i>et al.</i> (2003)
Podmola Cave	Gintisi	1150	cave	?	1	Mmyo	GUÉORGUEV, BERON (1962)
Saguaroto Cave, Bilin Dol	Gintisi	1320	cave	Hibernaculum	2	Mmyo/bilythii, Rhip	BENDA <i>et al.</i> (2003)
Small tunnel in the Sanatoriunama	Iskrets	520	tunnel	Day roost	2	Maal, Rhip	new data
Svetata Voda Cave	Gintisi	1080	cave	Hibernaculum	4	Mbly, Mmyo, Rhfer, Rhip	GUÉORGUEV, BERON (1962), KOLEBINOVA, BERON (1965), PANDURSKA, BESHKOV (1998)
Svinskata Dupka Cave	Gara Lakatnik	450	cave	Swarming, Hibernaculum	12	Eser, Hsav, Msch, Mbech, Memar, Mmyo, Mmys, Plaus, Rhlola, Rheur, Rhfer, Rhip	KVARTIRNIKOV (1956), GUÉORGUEV, BERON (1962), BERON (1963), BERON, GUÉORGUEV (1967), PANDURSKA, BESHKOV (1998), POPOV, IVANOVA (2002), BENDA <i>et al.</i> (2003), new data
Zaskogova Yama Cave	Gintisi	1100	cave	Hibernaculum	2	Rhfer, Rhip	BENDA <i>et al.</i> (2003)
Travninata Cave	Dobravitsa	1005	cave	Swarming, Hibernaculum	10	Eser, Msch, Mbech, Mbly, Mmyo, Mnat, Plaur, Plaus, Rhfer, Rhip	PANDURSKA, BESHKOV (1998), new data
Tsurkvishte Cave	Breze	650	cave	Hibernaculum	1	Rhip	GUÉORGUEV, BERON (1962)
Unnamed small Cave	Gara Bov	612	cave	Swarming	1	Bbar	new data
Vodnata Peshtera Cave	Tserovo	540	cave	Maternity?, Hibernaculum	6	Msch, Mbly, Mcap, Mmyo, Rhfer, Rhip	BURESCH (1941), GUÉORGUEV, BERON (1962), PANDURSKA, BESHKOV (1998), BENDA <i>et al.</i> (2003), new data
Vrazha Dupka Cave 4	Gara Lakatnik	493	cave	Hibernaculum, Swarming, Transitional	1	Rhip	new data
Vrazha Dupka Cave 7	Gara Lakatnik	495	cave	Hibernaculum, Swarming, Transitional	1	Rhip	new data
Vrazha Dupka Cave 8	Gara Lakatnik	499	cave	Hibernaculum, Swarming, Transitional	2	Rhfer, Rhip	new data
Vrazha Dupka Cave 9 (=Golyama Vrazha Dupka Cave)	Gara Lakatnik	499	cave	Hibernaculum, Swarming, Transitional	5	Msch, Mmyo, Ppip, Rhfer, Rhip	BERON (1959), GUÉORGUEV, BERON (1962), PANDURSKA, BESHKOV (1998), BENDA <i>et al.</i> (2003), new data
Vrazha Dupka Cave 13	Gara Lakatnik	497	cave	Hibernaculum, Swarming, Transitional	2	Rhfer, Rhip	new data
Vrazha Dupka Cave 15	Gara Lakatnik	499	cave	Hibernaculum, Swarming, Transitional	3	Msch, Rhfer, Rhip	new data
Zastava Komshtitsa	Komshtitsa	1055	building	Maternity	1	Rhip	new data