Bats (Mammalia: Chiroptera) of the Western Rhodopes Mountain (Bulgaria and Greece)

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Abstract: A very high species diversity of bats was found in the Western Rhodopes Mountains, a border mountain between Bulgaria and Greece. Of the 35 bat species known from continental Europe, 30 species were found in the study area- Rhinolophidae, 5 species; Vespertilionidae, 23 species; Miniopteridae, 1 species; Molossidae, 1 species. Twenty seven of these species occur in Bulgarian part (all except *Pipistrellus nathusii, Myotis alcathoe* and *Rhinolophus mehelyi*) and 28 species in the Greek part of the mountains (all except *Plecotus auritus* and *Myotis brandtii*). *Myotis mystacinus* s.l. and *Nyctalus leisleri* are reported for the first time for the Bulgarian part and *Rhinolophus hipposideros*, *Rh. euryale*, *Rh. blasii*, *Plecotus austriacus*, *Nyctalus noctula*, *Pipistrellus pygmaeus* and *Barbastella barbastellus* for the Greek part of the mountain. Occurrence of *Myotis aurascens* needs further support with genetic data. Altogether bats were found in 164 localities- 128 in Bulgaria (of which 83 are caves and galleries) and 36 in Greece (of which 6 are caves and galleries). Sixty five percent of the Bulgarian bat records come from underground roosts, while less than 16% come from caves and galleries in Greece. The most common species belong to the cave-dwelling group- *Rhinolophus hipposideros*, *Rh. ferrumequinum*, *Myotis myotis*, *M. blythii* and *Miniopterus shreibersii*. Much rarely detected are the forest-dwelling species such as *Myotis bechsteinii*, *M. nattereri*, *Barbastella barbastellus* and *Nyctalus* spp. Seven areas are pointed to hold greatest species diversity – Trigrad-Yagodina (19 species), Peshtera (13 species), Gorna Arda (12 species) and Dobrostan (10 species) in Bulgaria and Kompsatos valley between Medousa and Kotani, Arkoudorrema River near Dipotama and Toxotes-Galani (with 12 species each) in Greece. Five caves in Bulgaria are classified as Important Bat Underground Habitats, of which Dyavolskoto Garlo cave is the most noteworthy regional hibernaculum, sheltering up to 40 800 bats, most of which *Miniopterus schreibersii*. External measurements of 55 individuals belonging to 15 species, ringing/recapture data and a map of all studied 89 caves and galleries are presented in Appendices.

Key words: bats, Western Rhodopes, Bulgaria, Greece, species composition, species distribution, conservation

[1] Otto von Helversen died on March 2nd 2009. This paper is dedicated on his untiring research enthusiasm and creativity.

Introduction

The Western Rhodopes are a vast expanse of mountain ranges covered with dense coniferous and mixed forests, situated between Bulgaria and Greece. The first record of bats in these mountains (Bulgarian part) comes from ATANASOV (1936), who reported the occurrence of *Rhinolophus ferrumequinum* in Novata Peshtera cave near the town of Peshtera. During intensive surveys of the Bulgarian cave fauna, some cave-dwelling species were reported by GUÉORGUIEV & BERON (1962) and BERON & GUÉORGUIEV (1967). Bats as hosts were reported in parasitological studies by BACHVAROV (1963), BERON (1973a, b; 1974), BERON & KOLEBINOVA (1964), DRENSKI (1955), HŮRKA (1984), KOLEBINOVA (1968), NOWOSAD et al (1987), SKURATOWICZ (1970) and others. In 1971, during a field survey by a group of Czech researchers on small mammals, 12 bat species were found with *Myotis brandtii* and *M. nattereri* reported for the first time in Bulgaria (HORÁČEK et al. 1971, 1974). Further visits by the same team added many new records, which together with contributions from the local researchers (e.g. BERON, 1961, 1964; PANDURSKA & BESHKOV, 1998) were compiled in the outlining paper of BENDA et al. (2003).

The first records of bats in the Greek part of the Western Rhodopes Mt. were published by LINDBERG (1955). He reported the occurrence of *Rhinolophus ferrumequinum*, *Myotis myotis* and *M. blythii* in a gallery near Kimmeria, Pref. Xanthi. Later on, German researchers added many new records (cf. WEID, 1988; VOLLETH 1987; HELVERSEN & WEID, 1990). After a careful examination of the collected bat material, the recently described species of whiskered bats *Myotis alcathoe* was found to occur also in the Western Rhodopes (Skaloti) (HELVERSEN et al., 2001). HANÁK et al. (2001) have published the most comprehensive recent account on bats in Greece, including records from this region.

Data on bat species composition and distribution in this mountain are scaterred over the years and have not been published in a single paper. This paper aims to summarize published records together with large amount of unpublished data and to analyse the seasonal occurrence of species and their dispersal movements both at local and regional scales.

Material and methods

Study area

The Western Rhodopes are the largest group of mountains within the Rilo-Rhodopean massif. The mountain (s.l.) covers 11 220 sq. km of which 8 732 sq. km belong to Bulgaria and 2 488 sq. km are in Greece (STEFANOV, 2006). The lowest foothills start from ca. 70-100 m in Greece, the highest point reaches 2191 m a.s.l in Bulgaria (Golyam Perelik Summit) and the average altitude is 1098 m. About half of the mountains (51.9%) is a submontane land (1000-1600m, Fig.1) and 8.7% is a typical montane land (above 1600 m). Maximum precipitation occurs in May-June with a subsidiary peak in November-December. The river network is dense and the flow regimes follow the local precipitation trends. The climate is transitional continental and average

Fig. 1. The Western Rhodopes: Mostovo village (950 m a.s.l.) and entrance of the cave Gargina Dupka at the right of the village.

yearly temperatures vary between 5°C to 9°C. Composition of the vegetation cover depends on altitude and slope exposure. Coniferous species such as *Pinus sylvestris*, *P. heldreichii*, *Picea abies* and *Abies alba* cover vast areas in Bulgaria (more than 70% of the tree coverage) between 1000 m and 1900 m (ALEXANDROV & DELKOV, 2006). Tree cover in lower altitudes is dominated by *Fagus sylvatica*, *Quercus petraea*, *Q. pubescens*, *Q. frainetto*, *Q. cerris*, *Juniperus oxycedrus* and *J. excelsa*.

Data collection

BULGARIA: Most new bat records were collected between 1992 and 2010 by the first author. The present paper is based on the unpublished project reports of BESHKOV & PETROV (2001), PETROV (2002, 2009a, 2009b), PETROV et al. (2005) and PETROV & STOEV (2006). More than 120 caves and galleries have been visited, many of them on a regular basis. This allowed us to comprehensively assess their importance for the bats in the region.

GREECE: Literature records on bat species composition and distribution from the Greek Western Rhodopes are fewer compared to the Bulgarian records. The majority of the original records were collected between 1983 and 2005 by the second author during numerous field trips as part of the uncompleted personal project "Bats of Greece". Additional unpublished data from other researchers (mentioned below) are also reported. Data come from the prefectures of Serres, Drama and Xanthi, mostly from Dipotama and Paranesti (Pref. Drama), as well as the vicinity of Xanthi and the valley of Kompsatos River near the border with Bulgaria. Data collected by the second author between 2005 and 2008, including findings of *M. brandtii*, *M. alcathoe*, *M. bechsteinii* and other species is not presented in this paper.

Bats in both countries were caught by hand from their roosts or by using mist-nets (mesh size 16 mm, length 3, 6, 8, 10 or 12 m) placed at entrances of caves and galleries,

and at rivers and streams. Untill 2005, the number of individuals in larger hibernating or breeding colonies (i.e. over 500 ind.) was visually scored to best possible level (expert's judgment). After 2005, all larger hibernation colonies (e.g. in Dyavolskoto Garlo cave, Ivanova Voda cave) were photographed with digital cameras. Number of individuals was precisely scored by surface area estimates (THOMAS & LAVAL, 1988). Different estimates were used depending on the species and the packing densities (see Appendix 4 for *Miniopterus schreibersii*).

Identification of species and reference points of the body measurements (see Appendix 5) (taken with plastic or metal caliper) follow the field-guide of DIETZ & VON HELVERSEN (2004). Bats were handled by different researchers, thus data on their gender, age and reproductive status were not always assessed or recorded. The following abbreviations are used: **m** = male, **f** = female, **ad** = adult, **juv** = juvenile (1-30 days old), **imm** = sexually immature. Bat detector PETTERSSON D200 was used in few cases in combination with visual behavioral observations. Records of non-professional bat researchers (biologists, cavers, etc.) were considered if their photographs and descriptions allowed precise identification to species level.

Data from the literature are summarized and presented in the list of localities for each species. Original records are given separately. All altitudes of the localities were measured by GARMIN GPS receivers and if necessary confirmed using data from the topographic maps. All underground bat roosts (n=89) mentioned in the text are listed in Appendix 1 and their position is shown in Appendix 2. Date is shown as day/month/year. Names of the principal observers/collectors are abbreviated as follows:

For Bulgaria: **BP –** Boyan Petrov, **TI –** Teodora Ivanova; **VB**- Vladimir Beshkov; **IB**- Ivailo Borissov; **AH –** Antonia Hubancheva; **TS –** Tihomir Stoyanov; **PS –** Pavel Stoev; **SS –** Slaveya Stoycheva; **DG –** Dilian Georgiev; **PN –** Pavel Nikolov; **GK –** Gerald Kerth; **LN –** Lars Nissen.

For Greece: **VH –** Otto von Helversen, **RW –** Roland Weid, **CD –** Christian Dietz, **ID –** Isabel Dietz.

Results

Species composition and distribution of bats in the Western Rhodopes

Of the **35** bat species known from continental Europe (DIETZ et al., 2009b), **30** species were found in the Western Rhodopes Mt. – Rhinolophidae, 5 species; Vespertilionidae, 23 species; Miniopteridae, 1 species; Molossidae, 1 species). We report for the first time *Myotis mystacinus* s.l. and *Nyctalus leisleri* for the Bulgarian Western Rhodopes and *Rhinolophus hipposideros*, *Rh. euryale*, *Rh. blasii*, *Plecotus austriacus*, *Nyctalus noctula*, *Pipistrellus pygmaeus* and *Barbastella barbastellus* for the Greek part of the mountain. We report bats from **164 localities**: **128** from Bulgaria (of which 83 caves and galleries) and **36** from Greece (of which 6 caves and galleries). Summary of distributional records for all species is presented in Figs. 3 and 4.

***Rhinolophus ferrumequinum* (Schreber, 1774)**
Published data

BULGARIA: Borikovo, Borikovskata Peshtera cave, 5 ind., 1.1.2003, TI (BENDA et al., 2003) **[1]**; Borino, Eminovata Peshtera cave, 7 ind., 7.10.1993, TI; idem., 2 ind., 15.9.1996, TI (BENDA et al., 2003) **[2];** Dobrostan, Ahmetyova Dupka cave, 12 ind., 28.12.1999, TI (BENDA et al., 2003) **[3]**; Dobrostan, Ivanova Voda cave, 3 ind., 20.2.1997, TI (BENDA et al., 2003) **[4]**; Dobrostan, Topchika cave, 2 ind. ,19.2.1997, TI (BENDA et al., 2003) **[5]**; Koshnitsa, Goloboitsa cave, 3.4.1967 (BERON 1972) **[6]**; Mogilitsa, Uhlovitsa cave, 1.4.1967 (BERON, 1968, 1970, 1973a, 1974, YANCHEV & STOYKOVA 1973); idem, 51 ind., 31.12.2002, TI (BENDA et al., 2003) **[7]**; Mostovo, Gargina Dupka cave, 1m, 18.3.1968, P. Beron (YANCHEV & STOYKOVA, 1973); idem, 1 ind., 2.4.1978 (NOWOSAD et al. 1987); idem, 20 ind., 31.1.1989; idem, 2 ind., 21.2.1997; idem., 8 ind., 7.2.1998, BP, TI; idem, 36 ind., 29.12.1999, TI (BENDA et al., 2003) **[8]**; Mugla, Drangaleshkata Propast chasm, 2 ind., 29.12.1993, TI (BENDA et al., 2003) **[9]**; Nadartsi, Nadarskata Peshtera cave, 3.4.1967 (YANCHEV & STOYKOVA, 1973); idem., 1 ind., 31.12.2002, TI, (BENDA et al., 2003) **[10]**; Orehovo, cave 100 m W of the village, 1m, net, 25.8.1980; idem., 2m, 1f, net, 28.6.1984, T. Scholz, D. Král (BENDA et al., 2003) **[11]**; Orehovo, Prilepnata Peshtera cave, 24.9.1961 (YANCHEV & STOYKOVA, 1973) **[12]**; Peshtera, Yubileina cave, 3 ind., 7.3.1992 (PANDURSKA & BESHKOV, 1998) **[13]**; Peshtera, Hralupata cave, 2m, 1f, 27.3.1978; idem, 1m, 12.6.1978 (SKURATOWICZ et al., 1982); idem., 1 ind., 27.4.1978 (NOWOSAD et al., 1987) **[14]**; Peshtera, Lilova Skala cave, 1f, 5.2.1965 (BENDA et al., 2003) **[15]**; Peshtera, Novata Peshtera cave, 80–100 ind. (ATANASOV, 1936); idem (DRENSKI, 1955); idem, 4 ind., 7.3.1992 (PANDURSKA & BESHKOV, 1998); 1f, 18.9.1962; idem., 20 ind., 31.11.1991, BP; idem., 127 ind., 8.12.1997, S. Tanev (BENDA et al., 2003) **[16]**; Peshtera, Snezhanka cave, 3.1.1961 (MARKOV & DZHAMBAZOV 1962); idem, 3 ind., 7.3.1992 (PANDURSKA & BESHKOV, 1998); idem., 2m, 1f, 5.2.1965 (cf. HŮRKA, 1984a); idem., 1f, 23.11.1991, BP; idem, 5 ind., 1.3.1992, BP (BENDA et al., 2003) **[17]**; Peshtera, Ushatovi Doupki cave (GRIMMBERGER 1993); 1m, 1f, 8.8.1967 (BENDA et al., 2003) **[18]**; Peshtera, Vodnata Peshtera cave, 15 ind., 30.11.1991, BP (BENDA et al., 2003) **[19]**; Ribnovo, Manuilovata Peshtera cave, 28.5.1960 (BERON, 1962); idem., 50 ind., 14.2.1998, BP, TI; idem., 2m, 1f, net, 22.6.2000, BP (BENDA et al., 2003) **[20]**; Stoykite, tunnel in the village, 1 ind., net, 4.7.1983 (BENDA et al., 2003) **[21]**; Trigrad, Dyavolskoto Garlo cave, 10 ind., 2.12.2000, BP (BENDA et al., 2003) **[22]**; Trigrad, Gorni Razh №3 cave, 2 ind., 13.2.1998, BP, TI (BENDA et al., 2003) **[23]**; Velingrad, 1m, 10.7.1926, V. Stribarni (BENDA et al., 2003) **[24]**; Velingrad, Lepenitsa cave, 24.12.1960 (BERON, 1962); idem, 4 ind., 6.10.1994 (PANDURSKA & BESHKOV, 1998) **[25]**; Velingrad, Suhata Peshtera cave, 4f, 6juv., net, 27.6.2000, BP, PN (BENDA et al., 2003) **[26]**; Yagodina, Sanchova Dupka cave, 1m, net, 3.8.1971 (HORÁČEK et al., 1971, 1974) **[27]**; Yagodina, Yagodinskata Peshtera cave, 1m, 6.1.1976 (NOWOSAD et al., 1987); idem., 3m, 2.8.1971 (HORÁČEK et al., 1971, 1974); idem, 1m, net, 15.8.1978 (BENDA et al., 2003) **[28]**; Bachkovo, 3km N of the village, at the W bank of Chaya River, abandoned concrete storage, about 5 m in height, with a dense vegetation around, alt. 350m, 200 ind., 27.6.2006, SS, DG (TILOVA et al., 2005) **[29].**

GR: Kimmeria, Pref. Xanthi, gallery, 1m, 16.5.1954 (LINDBERG, 1955) **[30]**.

Original data

BG: Bachkovo, 3km N of the village, at the W bank of Chaya River, abandoned concrete storage, alt. 350m, 500 ad.+juv. in a mixed colony with *Rhinolophus euryale*, 10.8.2008, BP, AH; idem., 250-300 ad.+juv., 10.9.2008, BP; idem., 80-100 ad.+juv., 2.10.2008, BP, AH; idem., 50 ind., in torpor, 6.10.2008, BP; AH **[29]**; Borikovo, Borikovskata Peshtera cave, 15 ind., 19.3.2004, BP, TS **[1];** Breze, Byaloto Kamene cave, 2 ind., 6.2.1997, BP **[31]**; Doborstan, Topchika cave, 26.5.1968, VB **[5];** Dobrostan, Ahmetyova Dupka cave, 2 ind., 21.10.2001, BP, VB **[3];** Dobrostan, Ivanova Voda cave, 1 ind., t=4ºC, 4.2.2006, BP, NS **[4];** Dolno Vlahovo, Potoka cave, 1 skull, 1 flying, 16.7.2006, BP, PS **[32];** Dryanovo, Mogila cave, site Staro Selo, 1 ind., 23.10.2005, IB **[33];** Grohotno, disused mine gallery, 1 ind., 6.8.1997, BP; idem., 1m, 13.3.1998, BP **[34];** Kesten, Forgovo I cave, 1 ind., 18.9.2005, BP **[35]**; Koshnitsa, Goloboitsa cave (lower entrance, Vodnata), 2f, post-lactating, net, 13.7.2006, BP; idem., (upper entrance, Suhata), 60-70 ind., 12.9.2009, SS, DG **[6];** Laki, disused mine gallery, 1m, net, 9.10.2005, BP, TI, IB **[36]**; Mihalkovo, disused mine gallery, 1 ind., 1.9.2001, BP, VB **[37]**; Mihalkovo, the junction to Stomanevo, in abandoned house, 1 ind., 1.9.2001, BP, VB **[38];** Belitsa, Shepran Dupka cave, 2m, 1f, 18.10.2001, BP, VB; idem., 2m, 8.10.2005, BP, TI, IB; idem., 1m, net, 22.4.2006, BP **[39]**; Mogilitsa, Uhlovitsa cave, 3 ind., 9.11.1997, BP **[7];** Mostovo, Gargina Dupka cave, 1 ind., 15.3.1992, BP; idem., 2 ind., 28.2.2008, AH, V. Petrov **[8];** Mostovo, Borovskata Vodna Peshtera cave, 2 skulls, 21.10.2001, BP, VB **[40]**; Nedelino, Vodnata (Godumovata) Peshtera cave, 1 ind., 31.7.1999, BP, VB; idem., 2 ind., 12.12.2000, BP; idem., 1 ind., 20.10.2006, BP, TS; idem., 4 ind., 13.9.2009, SS, DG **[41];** Peshtera, Yubileina cave, 4 ind., 7.11.2004, BP; idem., 56 ind., 14.2.2010, SS **[13];** Peshtera, Novata Peshtera cave, 10 ind., 30.3.1996, BP; idem, 7 ind., 15.1.2000, BP; 6 ind., 7.11.2004, BP; idem., 18 ind., 16.2.2008, BP; idem., 1 ind., 19.10.2009, SS, DG **[16];** Peshtera, Ushatovi Doupki cave, 1m, 8.6.2006, BP **[18];** Ravnogor, Pavla cave, 1 ind., 24.8.2008, SS, DG ; idem., 4 ind., 21.11.2009, SS, DG **[42];** Ribnovo, Manuilovata Peshtera cave, 1 ind. 18.11.2006, BP; idem, 15 ind., 3.3.2007, BP, IB; idem., 70 ind., 10.10.2010, BP, T. Georgieva **[20]**; Ribnovo, Skoka cave, 1 ind., t=13ºC, 18.11.2006, BP **[44];** Smilyan, Kraipatnata Peshtera cave, 2m, net, 11.7.1997, BP **[45];** Trigrad, Dodalitsa II cave, on the road towards Chairite, 1 ind., 30.11.1995, BP **[46];** Velingrad, Lepenitsa cave, 6 ind, 25.11.1993, BP, PS **[25];** Velingrad, Suhata Peshtera cave, 2 ind, 26.11.1993, BP, PS; idem., 1f pregnant, 1f+juv, 2f, 1m, net, 30.6.2006, BP, PS **[26];** Yagodina, Dolna Karanska Dupka cave, 1 ind., 17.9.2005, BP **[47];** Yagodina, Gorna Karanska Dupka cave, 3 ind., net, 12.7.1997, BP **[48];** Yagodina, Yagodinskata Peshtera cave, 1m, net at the natural entrance, 3.8.1997, BP **[28]**.

GREECE: Paranesti, Pref. Drama, 150m, 1m, net, 15.6.1984, RW; idem., 1 ind., net, 21.6.1987, Liegl, Meschede, Weber; idem, 2f, net, 19.10.1988, RW, Geiger, Wiedinger **[49]**; Paradisos, Pref. Kavala, cave in the military area, alt. 50m, 1f, 13.9.1997, Rottmann; idem, many individuals, visual count and detector, 7.9.2001, A. Kiefer **[50]**; Galani, Pref. Kavala, unnamed cave in the gorge of Nestos River, alt. 60m, 4 ind., visual count and detector, 7.9.2001, A. Kiefer **[51]**; Sminthi, Pref. Xanthi, military bunker, alt. 250m, 1 ind., 7.9.2004, VH **[52]**; Xanthi, in the village, alt. 50m, 3f, net, 9.9.1983, RW; idem., 19 ind., 1.1.1985, VH **[53]**; Volcanic cave between Kato Thermes and Termiko Loutraki, Pref. Xanthi, alt. ca. 500m, 1m, visual count, 5.9.2004, VH; idem, 3 ind., net, 5.9.2004, VH **[54]**.

In most cases, only single individuals or small colonies were found. Breeding colonies were discovered only in a few roosts [e.g. 6, 26, and 29]. Occurrence of larger maternity colonies is rather possible in warmer, dry habitats, which are common in the periphery of the study area. The highest altitude where bats were found is at 1380m [3, 9] and the lowest at 50 m [53].

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

Published data

BULGARIA: Bachkovo, Bachkovski Monastery, 2m, 14.7.1976 (BENDA et al., 2003) **[1]**; Bachkovo, small cave, 1f, 30.7.1979 (BENDA et al., 2003) **[2]**; Bachkovo, 3km N of the village, at the W bank of Chaya River, abandoned concrete storage, about 4m in height, with a dense vegetation around, alt. 280m, 60 ind., 27.6.2006, SS, DG (TILOVA et al., 2005) **[3];** Borikovo, Borikovskata Peshtera cave, 3 ind., 1.1.2003, TI (BENDA et al., 2003) **[4]**; Byal Izvor, Ddzhin Gugu cave, 1 ind., 12.2.1998, BP, TI (BENDA et al., 2003) **[5]**; Chepelare, loft of a church tower, 1m, 13.7.1976 (BENDA et al., 2003) **[6]**; Dobrostan, Ahmetyova Dupka cave, 6 ind., 28.12.1999, TI (BENDA et al., 2003) **[7]**; Dobrostan, Ovchata Peshtera cave, 21.4.1960 (GUÉORGUIEV & BERON, 1962) **[8]**; Dobrostan, Topchika cave, 4 ind., 19.2.1997, TI (BENDA et al., 2003) **[9]**; Gospodintsi, Bekir Salievata Peshtera cave, 27.5.1960 (BERON & GUÉORGUIEV, 1967) **[10]**; Hvoyna, a small newly found cave, about 2 km NW from the village, 1 ind., March 2004, D. Georgiev, E. Tilova leg. (TILOVA et al., 2005) [**11**]; Kobilyane, Vodnata Peshtera cave, 7 ind., 12.2.1998 (BENDA et al., 2003) **[12]**; Kremene, Tamnitsata cave, 3.4.1967 (KOLEBINOVA, 1968) **[13]**; Krichim, building, 10.6.1917: coll. 1f, I. Buresch; idem., 1f, 10.4.1939, I. Buresch (BENDA et al., 2003) **[14]**; Mogilitsa, Uhlovitsa cave, 26 ind., 31.12.2002 (BENDA et al., 2003) **[15]**; Mostovo, Borovskata Vodna Peshtera cave (as "Borovo, Borovskata Dupka cave"), 2f, 19.3.1968 (JANCHEV & STOYKOVA, 1973, BERON, 1974) **[16]**; Mostovo, Gargina Dupka cave, 3 ind., 21.12.1997; idem., 1 ind., 7.2.1998, BP, TI; idem., 2 ind., 21.5.1998, TI (BENDA et al., 2003) **[17]**; Mostovo, Zmiin Borun cave, 2 ind., 21.2.1997 (BENDA et al., 2003) **[18]**; Nadartsi, Nadarskata Peshtera cave, 5 ind., 31.12.2002 TI (BENDA et al., 2003) **[19]**; Mugla, Drangaleshkata Propast chasm, 3 ind., 29.12.1993, TI (BENDA et al., 2003) **[20]**; Peshtera, Snezhanka cave, 3.1.1960 (MARKOV & DZHAMBAZOV, 1962); idem., 8 ind., 7.3.1992 (PANDURSKA & BESHKOV, 1998) **[21]**; Peshtera, Lilova Skala cave, 1f, 5.2.1965 (BENDA et al., 2003) **[22]**; Peshtera, Novata Peshtera cave, 5 ind., 7.3.1992 (PANDURSKA & BESHKOV, 1998); idem., 1m, 4.2.1965; idem., 1 ind., net, 11.7.1981; idem., 10 ind., 31.11.1991, BP; idem., 10 ind., 8.12.1997, S. Tanev (BENDA et al., 2003) **[23]**; Peshtera, Snezhanka cave, 1m, 5.2.1965; idem., 1 ind., 23.11.1991, BP; idem., 30 ind., 1.3.1992 (BENDA et al., 2003) **[24]**; Peshtera, Vodnata Peshtera cave, 10 ind., 30.11.1991, BP; idem., 5 ind., 2.3.1992 (BENDA et al., 2003) **[25]**; Peshtera, Yubileina cave, 2 ind., 7.3.1992 (PANDURSKA & BESHKOV, 1998) **[26]**; Ribnovo, Manuilovata Peshtera cave, 14.5.1959 (GUÉORGUIEV & BERON, 1962); idem., 3 subfossil ind., 30.4.1994, BP (BENDA et al., 2003) **[27]**; Trigrad, Gorni Razh No 3 cave, 3 ind., 13.2.1998, BP, TI (BENDA et al., 2003) **[28]**; Velingrad, Lepenitsa cave, 24.12.1960 (GUÉORGUIEV & BERON, 1962); idem., 1 ind., 17.12.1961

(BESHKOV & BERON, 1962); idem., 1 ind., net, 9.7.1981 (BENDA et al., 2003); idem., 3 ind., 6.10.1994 (PANDURSKA & BESHKOV, 1998) **[29]**; Yagodina, Dolna Karanska Dupka cave, 1m, net, 16.8.1978 (BENDA et al., 2003) **[30]**; Yagodina, Gorna Karanska Dupka cave, 1m, net, 16.8.1978 (BENDA et al., 2003) **[31]**; idem., 6 ind., 23.11.1993 (PANDURSKA & BESHKOV, 1998) **[32]**; Yagodina, Karnata Peshtera cave, 2 ind., 23.11.1993 (PANDURSKA & BESHKOV, 1998) **[33]**; Yagodina, Sanchova Dupka cave, 1 recent skeleton, 13.8.1971 (HORÁČEK et al., 1971, 1974); idem., 15 ind., 23.11.1993 (PANDURSKA & BESHKOV, 1998) **[34]**; Yagodina, Yagodinskata Peshtera cave, 5m, 1f, net, 15.8.1978; idem., 3m, 2f, net, 26.10.2002, R. Lučan (BENDA et al., 2003); idem., 8 ind., 23.11.1993 (PANDURSKA & BESHKOV, 1998) **[35]**.

Original data

BULGARIA: Assenovgrad, karstic niche above the town, 20.4.1960, VB **[36];** Bachkovo, 3km N of the village, at the W bank of Chaya River, abandoned concrete storage, alt. 280m, 8 ind., 10.9.2008, BP **[3];** Belitsa, Shepran Dupka cave, 2m, 18.10.2001, BP, VB; idem., 4m, 2f, 8.10.2005, BP, TI, IB; idem., 2m, net, 22.4.2006, BP **[37];** Boevo, Boevskata Peshtera cave, 1 ind., 31.7.1999, BP, VB **[38];** Borikovo, Borikovskata Peshtera cave, 6 ind., 19.3.2004, BP, TS **[4];** Breze, Byaloto Kamene cave, 1 ind., 6.2.1997, BP **[39];** Dzhurkovo, disused mine gallery, 1m, 19.10.2001, BP, VB; idem., 2 ind., 8.10.2005, BP, TI, IB **[40];** Doborstan, Topchika cave, 2 ind., 26.5.1968, VB **[9];** Dobrostan, Pirkovskata Peshtera cave, 1 skull, 20.10.2001, BP, VB **[41];** Dryanovo, Barzibogovata Peshtera cave, 2 ind., 20.10.2005, IB **[42]**; Dryanovo, Leshtaka cave, 1 ind., 21.10.2005, IB **[43];** Dryanovo, Mogila cave, site Staro Selo, 1 ind., 23.10.2005, IB **[44]**; Gospodintsi, Bekir Salievata Peshtera cave, 1 skull, 2.11.1994, BP; idem., 1 ind., 25.5.2006, PS **[10];** Gospodintsi, Zlatarskata Peshtera cave, 1 ind., 2.11.1994, BP; idem., 1m, 17.11.2006, BP **[45];** Grohotno, disused mine gallery on the road to Teshel, 1 skull, 8.8.1997, BP **[46];** Kesten, Forgovo I cave, 6 ind., 11.11.2000, BP; idem., 4 ind., 18.9.2005, BP **[47];** Kremene, Kremenskata Peshtera cave, 1 ind., 15.7.2006, BP **[47];** Laki, disused mine gallery, 1m, net, 5 flying, 9.10.2005, BP, TI, IB [**49**]; Mihalkovo, disused mine gallery, 1 ind., 1.9.2001, BP, VB **[50];** Mogilitsa, Byala Voda cave, 1 skull, 1 ind., 13.7.2006, BP **[51];** Mogilitsa, Uhlovitsa cave, 6 ind., 9.11.1997, BP **[15];** Mostovo, Borovskata Vodna Peshtera cave, skulls, 21.10.2001, BP, VB **[16];** Mostovo, Gargina Dupka cave, 2 ind., 7.2.1998, BP, TI; idem., 3 ind., 26.2.2009, SS, DG; idem., 1 ind., 11.4.2010, SS, S. Deleva **[17];** Nedelino, Vodnata (Godumovata) Peshtera cave, 1 ind., 31.7.1999, BP, VB; idem., 3 ind., 12.12.2000, BP; idem., 4 ind., 20.10.2006, BP, TS; idem., 3 ind., 13.9.2009, SS, DG **[52];** Orehovo, Modarskata Peshtera cave, 1f, net, 26.9.1994, BP **[53];** Pamporovo Resort, Mechata Dupka cave, 4 ind., 19.10.2006, BP, TS **[54];** Peshtera, Snezhanka cave, 15 ind., 8.11.1997, BP **[24];** Peshtera, Yubileyna cave, 1 ind., 7.11.2004, BP; idem., 9 ind., 14.2.2010, SS **[26];** Peshtera, Novata Peshtera cave, 15 ind, 1.12.1991, BP; idem., 15 ind., 30.3.1996, BP; idem., 10 ind., 15.1.2000, BP; idem., 2 ind., 7.11.2004, BP; idem., 10 ind., 16.2.2008, BP **[23];** Peshtera, Ushatovi Dupki cave, 2 ind., 8.4.2006, BP **[55];** Pletena, Banyan cave, 1 ind., 16.6.2006, BP, PS **[56]**; Potoka, Tipitseto cave, 1 ind., 1 skull, 20.7.2005, TI, IB **[57];** Ravnogor, Pavla cave, 2 ind., 8.4.2006, BP; idem., 2 ind., 20.9.2008, SS, DG; idem., 1 ind., 21.11.2009, SS, DG **[58];** Ribnovo, Manuilovata

Peshtera cave, ca. 50 ind., 14.2.1998, BP; TI; idem., 1m, 18.11.2006, BP; idem., 15 ind., 3.3.2007, BP, IB **[27];** Smilyan, Kraipatnata Peshtera cave, 1 skull, 11.7.1997, BP; idem., 3 ind., 18.3.2004, BP, TS **[59];** Velingrad, Lepenitsa cave, 7 ind, 25.11.1993, BP, PS **[29]**; Velingrad, Suhata Peshtera cave, 20 ind, 26.11.1993, BP, PS; idem., 2 ind., net, 27.6.2000, BP, PN; idem., 1m, net, 30.6.2006, BP, PS **[60];** Yagodina, Gorna Karanska Dupka cave, 2 ind., 12.7.1997, BP **[32];** Yagodina, Yagodinskata Peshtera cave (natural entrance), 2 ind, net, 3.8.1997, BP; idem., ca. 20 ind., 4.6.2000; idem., 2m, net, 14.09.2001, BP, GK; idem., 5 ind., net, 17.9.2005, net, BP **[35];** Zabardo, Hut Chudnite Mostove, 1m, net, 27.9.1994, BP **[61];** Zabardo, Tyovnata Dupka cave, 1 ind., 20.3.2004, BP, TS **[62]**; Madan, Sharenka cave, 3 ind., January 2009, R. Kehaiova **[63];** Madan, discussed mine gallery near the trailhead towards Sharenka cave, 1 ind., 12.9.2008, BP; idem, 1 ind., 4.10.2008, BP, AH; idem, 1 ind., 17.1.2009, BP, AH **[64];** Madan, Pechinsko, dususued storage gallery, 2 ind., 17.1.2009, BP, AH **[65];** Madan, in building of Hadzhiiski dol mining area, a breeding colony of ca. 20-25 ind., June 2008, R. Kehaiova **[66];** Varba, disused mine gallery, 2 ind., 17.1.2009, BP, AH **[67];** Progled, Sbirkovata Peshtera cave, t=5.7ºC, 1 ind., 9.1.2010, BP **[68]**; Devin, short gallery on the road at 200m after the junction towards Shiroka Laka, 3 ad., 12.9.2010, BP, V. Karadakov **[69].**

GREECE: Paranesti, Pref. Drama, Loutra Thermia, alt. 370m, 6 ind., net, 1.6.1984, RW; idem., 4f with juv., visual count, 17.4.1986, Bader **[70]**; Paranesti, Pref. Drama, 150m, 1m, net, 24.9.1984, RW; idem., 8 ind., visual count, 31.5.1985, VH, Kriegbaum **[71]**; Dipotama, Pref. Drama, Arkoudorrema River, alt. 450 m, 1m, net, 30.8.1987, VH; idem., 1f, 2.9.1987, VH; idem., many ind., 19.8.1997, VH **[72]**; Paradisos, Pref. Kavala, cave in the military area, alt. 50m, many ind., visual count and detector, 7.9.2001, A. Kiefer **[73]**; Melivia, Pref. Xanthi, four fords above the village, alt. 450 m, 1 ind., net, 6.9.2004, VH **[74]**; Volcanic cave between Kato Thermes and Termiko Loutraki, Pref. Xanthi, alt. ca. 500m, min. 3 ind. flying, visual count, 5.9.2004, VH; idem, many ind. flying above the river, visual count, 5.9.2004, VH **[75]**; Ford of Kompsatos River between Medousa and Kotani, Pref. Xanthi, alt. 320m, several ind. flying above the net, 4.9.2004, VH **[76]**.

The Lesser Horseshoe Bat is the most commonly encountered species in the area found in 76 localities (46,3% of all known localities). However, breeding colonies were rarely found [e.g. 3, 66]. The largest maternity colony reported [3] consists of ca. 60 ind. (TILOVA et al., 2005). However, this colony was not found during the summer surveys of 2008 and 2010. From April until November the species roosts in scattered shelters above ground (e.g. attics, warm basements, abandoned houses, etc.). Because these were only occasionally inspected, the species distribution and abundance data are probably underestimated. New species for the Greek part of the mountain. The highest altitude where the species was found was 1635m [53].

***Rhinolophus euryale* Blasius, 1853**

Published data:

BULGARIA: Peshtera, Lilova Skala cave, 2m, net, 15.8.1985 (GRIMMBERGER, 1993 **[1];** Peshtera, Novata Peshtera cave, 1m, 3f, 18.9.1962; idem., 1f, 23.5.1966, I. Grulich; idem., 90 ind., 31.11.1991, BP (BENDA et al., 2003) **[2]**; Peshtera, Ushatovi

Doupki cave, nursery colony of ca. 200 ind. (GRIMMBERGER, 1993); idem., nursery colony of ca. 800 ind., 8.8.1967 (BENDA et al., 2003) **[3]**; Ribnovo, Manuilovata Peshtera cave, 3m, 2f, 30.4.1994, BP (POPOV & IVANOVA, 2002); idem., 3m, net, 22.6.2000, BP (BENDA et al., 2003) **[4]**.

Original data:

BULGARIA: Bachkovo, 3km N of the village, at the W bank of Chaya River, abandoned concrete storage, alt. 350m, 1 mummy, mixed colony with *Rhinolophus ferrumequinum*, 10.8.2008, BP, AH; idem., several flying ind., detector, 10.9.2008, BP; idem., 25 ind., detector, 6.10.2008, BP, AH **[5]**; Belitsa, Shepran Dupka cave, 1m, 18.10.2001, net, BP, VB; idem., 1m, net, 22.4.2006, BP **[6];** Peshtera, Novata Peshtera cave, 1f, 15.1.2000, BP; idem., lower entrance, 1m, net, 1.7.2006, BP, PS **[2];** Slashten, Stapalkata cave, ca. 50 ad. + juv., 17.6.2006, BP, PS **[7].**

GREECE: Potamoi (Potami), Pref. Drama, Dospat Dere valley (Despatis valley), cave Folia Drakou, ca. 100 ad. + subad., 21.9.2000, BP, PS **[8]**; Galani, Pref. Kavala, unnamed cave in the gorge of Nestos River, alt. 60m, 1 subfossil, 29.3.1997, Rottmann **[9]**.

The species has a limited distribution in the study area. Small summer colonies (usually mixed with *Rh. ferrumequinum* and *Rh. blasii*) were mainly found in the peripheral karstic areas of the mountains near river valleys with thermophilic deciduous forests and bushy vegetation [e.g. 5, 7]. Some known breeding colonies [e.g. 3] were not found during the present study in the underground roosts where they were originally found. Seasonal migrations are possible between closely situated roosts [e.g. between 7 and 8] (cf. DIETZ et al., 2009a). This is a new species for the Greek part of the mountains. The highest altitude where the species was found was 1150m [4], the lowest was 60 m [9].

***Rhinolophus blasii* Peters, 1866**

Published data:

BULGARIA: Mogilitsa, Uhlovitsa cave, 1m, net, 20.7.1996, TI (BENDA et al., 2003) **[1]**; Peshtera, Novata Peshtera cave, 12.9.1962 (BERON & GUÉORGUIEV, 1967) **[2]**; Ribnovo, Manuilovata Peshtera cave, 2m, net, 22.6.2000, BP (BENDA et al., 2003) **[3]**; Smolyan, caves near Arda river, 26.12.1962 (YANCHEV & STOYKOVA, 1973) **[4];** Peshtera, Yubileyna cave, 1 ind., 29.2.2004, E. Tilova leg. (TILOVA et al., 2005) [**5**].

Original data:

BULGARIA: Peshtera Town, Novata Peshtera cave, 1m, 7.11.2004, BP **[2];** Ribnovo, Manuilovata Peshtera cave, 2m, net, 29.4.1994, BP **[3].**

GREECE: near Nestos River, Stavroupolis, Pref. Xanthi, alt. 75m, 1f, net, 24.5.1986, VH **[6]**; Kato Thermes, Pref. Xanthi, near a bridge and a spring above the village, alt. 500 m, 1f, net, 5.9.2004, VH **[7]**.

Rh. blasii is a rarely encountered species in the Western Rhodopes Mt. Its actual distribution and abundance in the study area is probably underestimated because it may go undetected in some of the known mixed colonies of *Rh. euryale* and *Rh. ferrumequinum* where its presence is highly possible. (cf. BENDA et al., 2003). This is a new species for the Greek part of the mountains. The highest altitude where the species was found was 1150m [3] (high-altitude record for Bulgaria), the lowest was 75 m [6].

***Rhinolophus mehelyi* Matschie, 1901**

Published data:

GREECE: Kimmeria, Pref. Xanthi, gallery, 1f lactating, 23.6.1989; idem., 1f lactating, 20.7.2000 (HANÁK et al., 2001) [1].

In Bulgaria, *Rh. mehelyi* is not a typical dweller in regions above 600m of altitude (BENDA et al., 2003). The only suitable areas where this species maybe found within the boundaries of the study area are probably the southern Greek foothills of the Rhodopes.

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

Published data:

BULGARIA: Borikovo, Borikovskata Peshtera cave, 1m, 9 ind., 1.1.2003, TI (BENDA et al., 2003) **[1]**; Gela, Lednitsata cave, 2m, net, 31.7.1971 (HORÁČEK et al., 1971, 1974) **[2]**; Mogilitsa, Uhlovitsa cave, 4m, net, 20.7.1996, TI (BENDA et al., 2003) **[3]**; Orehovo, cave 100 m W of the village, 1f, net, 28.6.1984 T. Scholz, D. Král (BENDA et al., 2003) **[4]**; Peshtera, Snezhanka cave, 2 ind., 14-15.12.1961 (BESHKOV & BERON, 1962, JANCHEV & STOYKOVA, 1973); idem., 2f, 19.9.1962 (BENDA et al., 2003) **[5]**; Peshtera, Ushatovi Doupki cave, colony of ca. 50 ind., 31.7.1989 (GRIMMBERGER, 1993); idem., 1f, 8.8.1967 (BENDA et al., 2003) **[6]**; Peshtera, Vodnata Peshtera cave, 2f, 2.3.1992 (BENDA et al., 2003) **[7]**; Ribnovo, Manuilovata Peshtera cave, 2m, net, 22.6.2000, BP (BENDA et al., 2003) **[8]**; Velingrad, a cave ca. 400 m above Lepenitsa cave, 1m, net, 9.7.1981 (BENDA et al., 2003) **[9]**; Velingrad, Lepenitsa cave, 2m, net, 9.7.1981 (BENDA et al., 2003) **[10]**; Yagodina, Gorna Karanska Dupka cave, 1m, net, 3.8.1971 (HORÁČEK et al., 1971, 1974) **[11]**; Yagodina, Sanchova Dupka cave, 3m, net, 3.8.1971 (HORÁČEK et al., 1971, 1974); idem., 3m, net, 15.8.1978 (BENDA et al., 2003) **[12]**; Yagodina, Yagodinskata Peshtera cave, 6m, net, 2.8.1971 (HORÁČEK et al. 1971, 1974); idem., 2m, 1m imm., net, 15.8.1978 (BENDA et al., 2003) **[13]**.

GREECE: On the road at 8km NW from the town of Xanthi, 1f lactating, 17.6.1989 (HANÁK et al., 2001) **[14].**

Original data:

BULGARIA: Bachkovo, 3km N of the village, at the W bank of Chaya River, abandoned concrete storage, alt. 350 m, 10 ind., 2.10.2008, BP, AH; idem., 1m subad., 6.10.2008, BP, AH **[15]**; Borikovo, Borikovskata Peshtera cave, 15 ind., 19.3.2004, BP, TS; idem., 1f imm, 2m imm, net, 9.8.2004, BP **[1]**; Dobrostan, Ivanova Voda cave, 1f, net, 24.4.2007, BP, IB; idem., 1 ind., 1.5.2007, BP, IB; idem., 1m ad., 1m juv, net, 10.8.2008, BP, AH; idem., 1m, net, 7.8.2010, SS, S. Deleva **[16]**; Ribnovo, Manuilovata Peshtera cave, 1m, 10.10.2010, BP, T. Georgieva **[8]**; Progled, Sbirkovata Peshtera cave, 1m, net, 6.8.1999, BP, VB **[17]**; Slashten, Stapalkata cave, 1 ind., 17.6.2006, BP, PS **[18]**; Yagodina, Gorna Karanska Dupka cave, 3m, net, 12.7.1997, BP **[11]**; Yagodina, Yagodinskata Peshtera cave, natural entrance, 2m, 2f, net, 3.8.1997, BP **[13]**.

GREECE: Nestos River near Sidironero, Pref. Drama, alt. 450, 1 ind., net, 1.6.1987, Liegl, Meschede, Weber **[19]**; Paranesti, Pref. Drama, Loutra Thermia, alt. 370m, 1 m, net, 20.6.1987, Liegl, Meschede, Weber leg. **[20]**; Dipotama, Pref. Drama, Arkoudorrema River, alt. 450m, 2f, net, 31.8.1987, VH; idem., 1f, net, 2.9.1987, VH; idem., 3m, 1f, net, 18.8.1997, VH; idem, 1m, net, 1.9.1987, VH **[21]**; Ford

of Kompsatos River between Medousa and Kotani, Pref. Xanthi, alt. 320m, 1m, net, 18.6.2004, VH, CD, ID; idem., 1m, net, 4.9.2004, VH **[22]**.

Although the number of localities is relatively high (n=22), the abundance of *M. emarginatus* in the study area is rather low. Captures of lactating females [e.g. 14] and of immature individuals [e.g. 1, 13, 15, 16] suggest the presence of maternity colonies in the area . These colonies may either roost in warm man made structures (e.g. bunkers, disused storage buildings, basements, etc.) or at the entrance of caves with large entrances (cf. BENDA et al., 2003). Only single individuals of the species were found to hibernate in the caves of the Western Rhodopes. The highest altitude where the species was found was 1610m [2], the lowest was 250 m [14].

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

Published data:

BULGARIA: Gela, Lednitsata cave, 2m, 3m imm, 1m juv, 1f, net, 13.8.1978 (BENDA & HORÁČEK, 1995) **[1]**; Gela, small cave near the village, 1m imm., net, 12.8.1978 (BENDA & HORÁČEK, 1995); idem, 1m imm., net, 13.8.1978 (BENDA & HORÁČEK, 1995) **[2]**; Orehovo, cave 100 m W of the village, 1m, net, 24.8.1980 (BENDA & HORÁČEK, 1995) **[3]**; Sarnitsa, Dospat Dam, forest, 1f, net, 10.8.2002 (BENDA et al., 2003) **[4]**; Velingrad, Suhata Peshtera cave, 1m, net, 27.6.2000, BP (BENDA et al., 2003) **[5]**; Yagodina, Dolna Karanska Dupka cave, 1f, net, 16.8.1978 (BENDA & HORÁČEK, 1995) **[6]**; Yagodina, Gorna Karanska Dupka cave, 1m, net, 3.8.1971 (HORÁČEK et al., 1974) **[7]**.

Original data:

BULGARIA: Dzhurkovo, disused mine gallery, 1m, net, 19.10.2001, BP, VB **[8]**; Gela, Lednitsata cave, 9m, 2m imm., 1f, net, 18.9.2005, BP **[1]**; Orehovo, Modarskata Peshtera cave, 1m, net, 26.9.1994, BP **[9]**.

GREECE: Arkoudorrema River below Prasinada, Pref. Drama, alt. 350m, 1f, net, 4.9.1997, VH **[10]**.

The number of localities (n=10) is surprisingly low considering the wide coverage of the species' optimal habitats in the Western Rhodope Mt., i.e. deciduous and mixed humid forests. Although immature individuals were captured in nets [e.g. 1, 2], breeding colonies were not found. Hibernating individuals have not been found. This is a new species for the Greek part of the mountains. The highest altitude where the species was found was 1635m [9], the lowest was 350 m [10].

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

Published data:

BULGARIA: Dobrostan, Ahmetyova Dupka cave, 6 ind., 28.12.1999, TI (BENDA et al., 2003) **[1]**; Dobrostan, Ivanova Voda cave, ca. 9000 ind., 20.2.1997, TI; idem., 3m, net, 27.8.1998, TI (BENDA et al., 2003) **[2]**; Mostovo, Gargina Dupka cave, 1 ind., 21.8.1959 (BERON, 1961, 1964; BERON & KOLEBINOVA, 1964, NOWOSAD et al., 1987); idem., 1 ind., 6.6.1978; idem., 2 ind., 16.6.1978; idem., 3 ind., 6.7.1978 (NOWOSAD et al., 1987); idem., 1m, net, 4.8.1995. TI; idem., 1m with partial albinism at the plagiopatagium, 7.2.1998, TI, BP; idem., 92 ind., 21.5.1998, TI; idem., obs. colony of ca. 500 ind., exam. 60m, 25.7.1998, TI; idem., 15. ind., 29.12.1999, TI (BENDA et al., 2003) **[3]**; Peshtera, Ushatovi Doupki cave, obs. 2m,

8.8.1967 (BENDA et al., 2003) **[4]**; Trigrad, Dyavolskoto Garlo cave, 4m, 1f, 1f juv., net, 23.6.1996, TI; idem., 1m, net, 29.6.2000, BP; idem., 5 ind., 2.12.2000 (BENDA et al., 2003) **[5]**.

GREECE: Kimmeria, Pref. Xanthi, gallery, alt. 150m, 1f, net, 16.6.1989; idem., 10 ind. (incl. 1f), 20.7.2000 (HANÁK et al., 2001) **[6].**

Original data:

BULGARIA: Belitsa, the natural bridge below the village, 1f, 1m, net over the river, 30.8.2001, BP, VB **[7];** Dobrostan, Ivanova Voda cave, 4 ind, net, 20.10.2001, BP, VB; idem., ca. 2500 ind., t=4.5ºC, 4.2.2006, BP, NS; idem., ca. 100 ind., 1.4.2007, BP, IB; idem., 2m, 2f, net, 5.4.2007, BP, IB; idem., 14m, 1f, net, 24.4.2007, BP, IB; idem., 2m, net, 1.5.2007, BP, IB; idem., 2m, net, 10.8.2009, BP, AH; idem., 3m, 4f, net, 10.9.2008, BP; idem., 1m, net, 7.8.2010, SS, S. Deleva; idem., 1m, 2f, net, 2.10.2010, SS, S. Deleva **[2];** Mostovo, Gargina Dupka cave, ca. 1500 ind., 28.2.2008, AH, V. Petrov; idem., 350 ind., mixed with *Miniopterus schreibersii*, 1m ringed (London Zoo Y7479), 10.9.2008, BP **[3];** Peshtera, Ushatovi Doupki cave, 1m, net, 8.6.2006, BP **[4];** Trigrad, Trigradksi Skali Hut, net above the river Trigradska Reka, alt. 1200m, 9m, 5.8.1997, BP **[8]**; Trigrad, Dyavolskoto Garlo cave, 2m, net, 16.6.2008, BP; idem., 1m, net, 13.9.2008, BP; idem., 1m, net, 23.5.2010, BP, SS; **[5]**; between Devin and Mihalkovo, disused mine gallery on the road, 1m, 16.2.2008, BP **[9].**

This typical dweller of underground roosts is not commonly encountered in the Western Rhodopes. Maternity colonies have not been found in the last ten years, though at some places [e.g. 3], such were known in the past. Ivanova Voda cave [2] is the largest known hibernaculum, where ringed individuals from the Eastern Rhodopes Mt. (ca. 144km SE) are regularly found (cf. HUTTERER et al., 2005; PAPADATOU et al., 2009). Presence of a permanent underground lake or a river in the caves used for wintering is considered as the most essential environmental parameter, which determines the roost choice of this species (cf. BENDA et al., 2003; own observations). The temperature in Bulgarian hibernacula varies between 3º to 5ºC, with values ≤2º and >5ºC only on rare occasions. Dyavolskoto Garlo Cave [5] is presumed to shelter a small hibernating colony (<1000 ind.), however it is almost impossible to estimate the number of *M. capaccinii* because they are mixed with tens of thousands *Miniopterus schreibersii* (see below). The highest altitude where the species was found was 1380m [1], the lowest was 150 m [6].

***Myotis aurascens* Kuzjakin, 1935**

Published data:

BULGARIA: Gela, Lednitsata cave, 1m, net, 31.7.1971 (cf. HORÁČEK et al., 1971, 1974, HŮRKA, 1976, BENDA & TSYTSULINA, 2000) **[1]**; Orehovo, Modarskata Peshtera cave, 1m, net, 26.9.1994, BP (BENDA & TSYTSULINA 2000) **[2].**

GREECE: Dipotama, Pref. Drama, Arkoudorrema River, alt. 450 m (BENDA & TSYTSULINA, 2000) [3].

Literature identification of "*aurascens*" specimens from the Rhodopes Mts. was based solely on the cranial morphology (BENDA & TSYTSULINA 2000). Recently, occurrence of this species in the Balkans was genetically confirmed only for a small area in the Bulgarian Danube plain (DIETZ et al. 2009b). Previous morphological "*aurascens*"

identifications from Bulgaria, including Rhodopes Mts. (cf. BENDA et al. 2003) must be assigned to *M. mystacinus bulgaricus* (MAYER et al. 2007). At present, firm identification of this species in field conditions is not possible.

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

Published data:

BULGARIA: Gela, Lednitsata cave, 4m, 1m imm., net, 31.7.1971 (cf. HORÁČEK et al., 1971, 1974, BENDA & TSYTSULINA, 2000); idem., 1m, net, 12.8.1978 (cf. BENDA & TSYTSULINA, 2000) **[1];** Chepelare, Samurski Dupki cave, 1m imm., net, 7.8.1971 (cf. HORÁČEK et al., 1971, 1974) **[2];** Trigrad, Chairska Reka River, 950m, 1 ind., net, 11.8.1994 (PANDURSKA & BESHKOV, 1998b) **[3].**

Original data:

BULGARIA: Progled, Sbirkovata Peshtera cave, 2m, net, 6.8.1999, BP, VB **[4].**

A Whiskered Bat, whose correct identification (especially for male individuals) is rather reliable in field conditions. It has still not been recorded from the Greek part of the mountain, though proper habitats along the border with Bulgaria are present. The highest locality where the bat was found was 1610m [1], the lowest was 950 m [3].

Myotis* cf. *brandtii

Original data

BULGARIA: Dobrostan, Ivanova Voda cave, at the entrance, 1f, 20.5.1998, BP, TI **[1]**.

Myotis mystacinus* (Kuhl, 1817) s.l. *bulgaricus

Published data:

GREECE: Dipotama, Pref. Drama, Arkoudorrema River, alt. 450 m (BENDA & TSYTSULINA 2000) **[1]**.

Original data:

BULGARIA: Gela, Lednitsata cave, 1f, net, 18.9.2005, BP **[2];** Progled, Sbirkovata Peshtera cave, 4m, net, 6.8.1999, BP, VB **[3];** Trigrad, 1km S of the village, 1f pregnant, net, 3.6.2000, BP, LN **[4]**; Trigrad, Trigradski Skali Hut, net above the river Trigradska Reka, alt. 1200m, 2m, 2.6.2000, BP, LN **[5];** Valchan, junction to Rudozem, net over Arda River, 1f, 19.7.2005, TI, IB **[6];** Yagodina, Yagodinskata Peshtera cave, net at the natural entrance, 1m, 3.8.1997, BP; idem., 1m, 14.9.2001, BP, GK **[7].**

GREECE: Skaloti, Pref. Drama, 1m, net, 24.6.1984, RW **[8]**; Paranesti, Pref. Drama, Loutra Thermia, alt. 370m, 1 m, 2f, net, 2.9.1997, VH **[9]**; above Paranesti, Pref. Drama, alt. 100m, 2m, net, 6.9.1983, RW; idem, 2m, 1f, net, 7.9.1983, RW; idem., 1m, net, 24.8.1984, RW **[10]**; Dipotama, Pref. Drama, Arkoudorrema River, alt. 450 m, 2m, 2f, net, 30.8.1987, VH; idem., 2m, 2.9.1987, VH; idem., 6m, 4f, net, 18.8.1997, VH; idem., many ind., visual count, 30.8.1997 and 3.9.1997, VH **[1]**; Livaditis, Pref. Xanthi, the waterfall above the village, alt. 1300m, 8.9.2004, VH **[11]**; 3km N of Xanthi, the Turkish Bridge, alt. 200 m, 1m, net, 19.6.2004, VH, CD, ID **[12]**; Melivia, Pref. Xanthi, four fords above the village, alt. 450 m, 5m, 2f, net, 6.9.2004, VH **[13]**; River ford between Melivia, Kotili and Dimari, Pref. Xanthi, alt. 490 m, 2m, 1f, net, 17.6.2004, VH, CD, ID **[14]**; Kompsatos River near the volcanic cave between Kato Thermes and Termiko Loutraki, Pref. Xanthi, alt. 400 m, 1m, 1f,

net, 5.9.2004, VH **[15]**; Kato Thermes, Pref. Xanthi, near a bridge and a spring above the village, alt. 500m, 1m, 2f, net, 5.9.2004, VH **[16]**; Ford of Kompsatos River between Medousa and Kotani, Pref. Xanthi, alt. 320m, 4m, 3f, net, 4.9.2004, VH **[17]**; near Nestos River, Stavroupolis, Pref. Xanthi, alt. 75m, 1 ind., net, 24.5.1986, VH **[18]**; Arkoudorrema River below Prasinada, Pref. Drama, alt. 350m, 2f, net, 4.9.1997, VH **[19]**.

Many individuals identified in the field, including females and immature individuals, were assigned to belong to this morphological group (s.l.). Genetically identified as *M. m bulgaricus* are majority of the whiskered bat samples from Bulgaria (MAYER et al., 2007; DIETZ et al., 2009b). Further accumulation of genetic and morphologic data is needed to justify the variations and allow practical species identification. The highest locality where the bat was found was 1610m [2], the lowest was 75 m [18].

***Myotis alcathoe* von Helversen et Heller, 2001**

Published data:

GREECE: Paranesti, Pref. Drama, Loutra Thermia, alt. 370m, 1 f, net, 2.9.1997, VH (HELVERSEN et al., 2001) **[1];** Skaloti, Pref. Drama, 1m, September 1985 (VOLLETH, 1987; HELVERSEN et al., 2001) **[2].**

Original data:

GREECE: Nestos River near Sidironero, Pref. Drama, alt. 450, 1m, net, 25.9.1989, RW **[3]**; Dipotama, Pref. Drama, Arkoudorrema River, alt. 450m, 1f, net, 18.8.1997, VH **[4]**; Melivia, Pref. Xanthi, four fords above the village, alt. 450 m, 1m, net, 6.9.2004, VH **[5]**; Ford of Kompsatos River between Medousa and Kotani, Pref. Xanthi, alt. 320m, 1f, net, 15.6.2004, VH, CD, ID; idem., 1m, net, 4.9.2004, VH **[6]**.

Knowledge of the distribution of this cryptic species in Bulgaria and across Europe has been expanding in recent years (cf. NIERMANN et al., 2007; LUČAN et al., 2009). The new records from the Greek Western Rhodopes are within the known species' range. Its presence in the Bulgarian Western Rhodopes is expected but still not confirmed (see below). The highest altitude where the species was found was 1000 m [2], the lowest was 320 m [6].

Myotis* cf. *mystacinus*/*alcathoe

Published data:

BULGARIA: Chepelare, river 1 km N of the town, 1f, net, 5.8.1971 (HORÁČEK et al., 1974; BENDA & TSYTSULINA, 2000) **[1]**; Chepelare, Samurski Dupki cave, 1m imm., net, 7.8.1971 (HORÁČEK et al., 1971, 1974, BENDA & TSYTSULINA, 2000) **[2]**; Gela, Lednitsata cave, 4m, 1m imm, 1f imm., net, 31.7.1971 (HORÁČEK et al., 1971, 1974, BENDA & TSYTSULINA, 2000), idem., 2m imm., 1m juv., net, 13.8.1978 (BENDA & TSYTSULINA, 2000) **[3]**; Pamporovo Resort, cave, 1420m, 1m imm., net, 8.8.1971 (HORÁČEK et al., 1971, 1974, BENDA & TSYTSULINA, 2000) **[4]**.

Original data:

BULGARIA: Gela, Lednitsata cave, 2f, net, 18.9.2005, BP **[5]**.

Correct species' assignment of females and immature whiskered bats is hardly possible in field conditions. These records must be considered with caution until further genetic analysis clarifies their species status.

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

Published data:

BULGARIA: Ribnovo, Manuilovata Peshtera cave, 2m, net, 22.6.2000, BP (BENDA et. Al., 2003) **[1]**; Yagodina, Yagodinskata Peshtera cave, 1m, net, 2.8.1971 (HORÁČEK et al., 1971, 1974); idem., 1m, 15.8.1978 (BENDA et al., 2003); idem., 5m, net, 14.9.2001, BP, GK; idem., 2m, net, 17.9.2005, BP (PETROV, 2006) **[2]**.

GREECE: Paranesti, Pref. Drama, Loutra Thermia, alt. 370 m, 1f, net, 20.6.1987, Liegl, Meschede, Weber (HELVERSEN & WEID, 1990) **[3].**

Original data:

BULGARIA: Varba, water derivation gallery, 1m, net, 5.10.2009, BP, AH **[4].**

GREECE: Ford of Kompsatos River between Medousa and Kotani, Pref. Xanthi, alt. 320m, 1m, 1f, net, 15.6.2004, VH, CD, ID **[5]**; Kato Thermes, Pref. Xanthi, near a bridge and a spring above the village, alt. 500 m, 1f, net, 5.9.2004, VH **[6]**.

The number of records from the study area is much lower than expected with regards to the broad coverage of the species' most preferred habitats (cf. PETROV 2006). Further findings are expected in the beech and oak woodlands with high proportion of hollow trees. The highest altitude where the species was found was 1150m [1], the lowest was 320m [5].

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

Published data:

BULGARIA: Gela, Lednitsata cave, 1m, net, 13.8.1978 (BENDA et al., 2003) **[1]**.

GREECE: Dipotama, Pref. Drama, Arkoudorrema River, alt. 450 m, 1m, net, 30.8.1987; idem., 1m, net, 2.9.1987 (HELVERSEN & WEID, 1990) **[2].**

Original data:

BULGARIA: Dyadovtsi, the bridge Dyadovksiya kemer, alt. 400m, 1m, 7f, net, 30.7.1999, BP, VB **[3]**; Trigrad, 1km S of the village, ca. 30 ind. foraging over a pond, peak frequency 45 kHz, detector, 3.6.2000, BP, LN **[4]**; Yagodina, Yagodinskata Peshtera cave, 1m imm., net, 17.9.2005, BP **[5]**.

The present number of records hardly represents the true occurrence and abundance of this species in the Rhodopes. The mountain is rich in forests of all types, permanent and seasonal streams, brooks, rivers, lakes and ponds. The highest altitude where the species was found was 1610m [1], the lowest was 400 m [3].

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

Published data:

BULGARIA: Assenovgrad, Asenova Krepost, 6.6.1957 (HANÁK & JOSIFOV, 1959) **[1];** Bachkovo, Bachkovski Monastery, 1m, 21.7.1979 (BENDA & HORÁČEK, 1995) **[2];** Batak, loft of a church tower, 1m, 12.7.1981 (BENDA et al., 2003) **[3]**; Borikovo, Borikovskata Peshtera cave, 2.4.1967 (BERON, 1968, JANCHEV & STOYKOVA, 1973); idem., 40 ind., 1.1.2003, TI (BENDA et al., 2003) **[4]**; Chepelare, Samurski Dupki cave, 1f, net, 7.8.1971 (HORÁČEK et al., 1971, 1974, BENDA & HORÁČEK, 1995) **[5]**; Dobrostan, Ahmetyova Dupka cave, 6 ind., 28.12.1999, TI (BENDA et al., 2003) **[6]**; Dobrostan, Ivanova Voda cave, skulls, 25.08.1967 (HAZELTON, 1970); idem., nursery colony, 23.7.1979 (BENDA & HORÁČEK, 1995); idem., obs. Past colony (skeletons), 12.7.1982; idem., ca. 6500 ind., 20.2.1997;

idem., nurs. Colony of ca 400 ind., 20.5.1998, TI, BP: idem., 2m, 2m juv., 21f lactating, 5f juv., net, nursery colony of ca. 500 ind., 24.7.1998; idem., nursery colony of ca. 500 ind., 27.6.2000 (BENDA et al., 2003) **[7]**; Gela, Lednitsata cave, 4m, 2f, net, 31.7.1971 (HORÁČEK et al., 1971, 1974); idem., 1 ind., net, 13.8.1978 (BENDA et al., 2003); idem. 12 ind., 10.3.1991 (PANDURSKA & BESHKOV, 1998b) **[8];** Mogilitsa, Uhlovitsa cave, 1m, net, 20.7.1996, TI; idem., 21 ind., 31.12.2002, TI (BENDA et al., 2003) **[9]**; Orehovo, cave 100 m W of the village, 1m, net, 28.6.1984, T. Scholz, D. Král; idem., 1m, net, 30.6.1984, T. Scholz, D. Král (BENDA & HORÁČEK, 1995; BENDA et al., 2003) **[10]**; Peshtera, Novata Peshtera cave (DRENSKI, 1955); idem., 2m, 1f, 18–19.9.1962 (BENDA & HORÁČEK, 1995); idem., 1m, 1f, 4.2.1965 (HŮRKA. 1984a, BENDA & HORÁČEK, 1995) **[11];** Peshtera, Snezhanka cave, 3.1.1961 (MARKOV & DZHAMBAZOV, 1962), idem., 3f, 2f, 5.2.1965 (HŮRKA, 1984A, BENDA & HORÁČEK, 1995); idem., 1 ind., 7.3.1992, (PANDURSKA & BESHKOV, 1998b) **[12];** Peshtera, Vodnata Peshtera cave, 20 ind., 30.11.1991, BP; idem., 1m, 2f, 2.3.1992 (BENDA et al., 2003) **[13];** Peshtera, Yubileyna cave, 1 ind., 7.3.1992 (PANDURSKA & BESHKOV, 1998b) **[14];** Ribnovo, Manuilovata Peshtera cave, 30 ind., 14.2.1998, BP, TI; idem., 1m, net, 22.6.2000, BP (BENDA et al., 2003) **[15];** Velingrad, Lepenitsa cave, 24.12.1960 (BERON & GUÉORGUIEV, 1962); idem., 2 ind., 17.12.1961 (BESHKOV & BERON, 1962); idem., 1f lactating, net, 9.7.1981 (BENDA et al., 2003); idem., 4 ind., 6.10.1994 (PANDURSKA & BESHKOV, 1998b) **[16]**; Yagodina, Dolna Karanska Dupka cave, 1m, net, 16.8.1978 (BENDA et al., 2003) **[17]**; Yagodina, Sanchova Dupka cave, 1m, net, 3.8.1971 (HORÁČEK et al. 1971, 1974) **[18];** Yagodina, Yagodinskata Peshtera cave, 1m, 1f, net, 2.8.1971 (HORÁČEK et al. 1971, 1974, BENDA & HORÁČEK, 1995); idem, 1m, net, 15.8.1978 (BENDA & HORÁČEK, 1995) **[19].**

GREECE: Kimmeria, Pref. Xanthi, gallery, 1m, 16.5.1954 (LINDBERG, 1955); idem., 2m, 1f, 16.6.1989; idem., colony of ca. 1000 ind., 4m, net, 23.6.1989 (BENDA & HORÁČEK, 1995); idem., 6m, 14f, 20.7.2000 (HANÁK et al., 2001) **[20];** Toxotes, Pref. Xanthi, railway tunnel 2km NW, 2m, 1f, 20.9.1966 (SPITZENBERGER, 1996) **[21].**

Original data:

BULGARIA: Belitsa, Shepran Dupka cave, 1m, net, 18.10.2001, BP, VB; idem., 1m, 3f, 8.10.2005, BP, TI, IB **[22]**; Borikovo, Borikovskata Peshtera cave, 1f, 19.3.2004, BP, TS **[4];** Dobrostan, Ivanova Voda cave, 1m, net, 20.10.2001, BP, VB; idem., 5f, net, 5.4.2007, BP, IB; idem., 8f, net, 22.4.2007, BP, IB; idem., 12m, 15f, net, 24.4.2007, BP; IB; idem., 2f, 1.5.2007, BP, IB; idem., 19f, 16 lactating, net, 13.6.2008, BP; idem., 10m, 11f, net, 10.8.2008, BP, AH; idem., 2m, 5f, many imm., net, 10.9.2008, BP; idem., 3m, 5f, net, 7.8.2010, SS, S. Deleva; idem., 6m, 2f, net, 2.10.2010, SS, S. Deleva **[7];** Gela, Lednitsata cave, 1m, 1f, net, 18.9.2005, BP **[8];** Koshnitsa, Goloboitsa cave (lower entrance, Vodnata), 1 ind., 19.7.2005, TI, IB **[23];** Mogilitsa, Uhlovitsa cave, 1m, 9.11.1997, BP **[9];** Mostovo, Gargina Dupka cave, 7.2.1998, 7 ind., BP, TI **[24];** Orehovo, Modarskata Peshtera cave, 1f, net, 26.9.1994, BP **[25];** Peshtera, Novata Peshtera cave, 4 ind., 7.11.2004, BP; idem., 1 skull, 21.5.2006, S. Deleva leg., SS det.; idem., 2 skulls, 20.4.2008, SS, DG; idem., 1 ind., 19.10.2009, SS, DG **[11];** Peshtera, Yubileina cave, 10 ind., 14.2.2010, SS **[14];** Progled, Sbirkovata Peshtera cave, 1f,

12.9.2009, SS, DG **[26]**; Ravnogor, Pavla cave, 2 skulls, 9.11.2008, S. Deleva leg., SS det.; idem., 4 ind., 21.11.2009, SS, DG **[27]**; Ribnovo, Manuilovata Peshtera cave, 1 ind., 10.10.2010, BP, T. Georgieva **[15];** Varba, water derivation gallery, 1m, net, 5.10.2009, BP, AH **[28]**; Velingrad, Suhata Peshtera cave, 1m, net, 30.6.2006, BP, PS **[29];** Yagodina, Gorna Karanska Dupka cave, 1m, net, 12.7.1997, BP; idem., 2m, net, 4.8.1997, BP **[30];** Yagodina, Yagodinskata Peshtera cave, 1m, net, 3.8.1997; idem., 1m, net; 14.9.2001, BP, GK; idem., 4m, 17.9.2005, BP **[31].**

GREECE: Nestos River near Sidironero, Pref. Drama, alt. 450, 1 ind., net, 6.9.1983, RW **[32]**.

Both "large" *Myotis* spp. are widely and almost evenly distributed throughout Bulgaria and Greece (BENDA et al., 2003; HANÁK et al., 2001). In the majority of the known localities they occur in sympatry, though in different proportions. Records of large *Myotis* spp. before 1985 were commonly *a priori* assigned to *M. myotis*. The colonies found in the most important hibernaculum in the Western Rhodopes [7] during the winter censuses were also provisionally assigned as *M. myotis*. However, recent intensive captures in the early spring and in the autumn showed that *M. blythii* is the dominant species in the colony [7] (ratio ca. 60/40). These observations are largely supported by preliminary data from the identification of subfossil skulls (most are *M. blythii*) collected in 2006 and 2007. The only breeding colony (mixed with *M. blythii*) within the study area was found in the same cave in the last 10-15 years. The highest altitude where the species was found was 1635 m [25], the lowest was 50 m [21].

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

Published data:

BULGARIA: Borikovo, Borikovskata Peshtera cave, 2.4.1967 (YANCHEV & STOYKOVA, 1973) **[1];** Dobrostan, Ivanova Voda cave, several skeletons, 25.8–5.9.1967 (HAZELTON, 1970); idem., 2 subfossil ind., 20.2.1997, TI; idem., 2f lactating and a nursery colony, net, 24.7.1998 (BENDA et al., 2003) **[2]**; Gela, Lednitsata cave, 3m, 2f, 4f imm., net, 31.7.1971 (HORÁČEK et al., 1971, 1974, BENDA & HORÁČEK, 1995); idem., 2m, 1f, net, 13.8.1978 (BENDA et al., 2003) **[3]**; Gela, small cave near the village, 1m, net, 12.8.1978 (BENDA et al., 2003) **[4]**; Laki, rocks in the valley bellow the town, 27.4.1985: 1 ind. (from owl pellets) (OBUCH & BENDA, 1996) **[5];** Mostovo, Gargina Dupka cave, 19.3.1968 (BERON, 1970, 1974; YANCHEV & STOYKOVA, 1973) **[6];** Orehovo, cave 100 m W of the village, 1m, net, 28.6.1984, T. Scholz, D. Král (BENDA & HORÁČEK, 1995) **[7];** Orehovo, cave in a quarry, 3m, 1f, net, 24.8.1980; idem., 1m, net, 25.8.1980 (BENDA et al., 2003) **[8]**; Perushtitsa, rocky gate, 1 ind., in pellets of *Strix aluco*, 28.4.1985 (OBUCH & BENDA, 1996) **[9];** Peshtera, Novata Peshtera cave, 1m, net, 11.7.1981 (BENDA et al., 2003) **[10]**; Turyan, Garvanyovitsa cave, 3.4.1967 (YANCHEV & STOYKOVA, 1973) **[11];** Velingrad, a cave ca. 400 m above Lepenitsa cave, 1m, net, 9.7.1981 (BENDA et al., 2003) **[12]**; Velingrad, Lepenitsa cave, 25.12.1960 (GUÉORGUIEV & BERON, 1962) **[13];** Yagodina, Dolna Karanska Dupka cave, 1f, net, 16.8.1978 (BENDA et al., 2003) **[14]**; Yagodina, Sanchova Dupka cave, 1 recent skeleton, 2.8.1971 (HORÁČEK et al., 1971, 1974) **[15];** Yagodina, Yagodinskata Peshtera cave, 1f, 6.1.1976 (NOWOSAD et al., 1987); idem., over a brook, 1f, net, 15.8.1978 (BENDA et al., 2003) **[16]**.

GREECE: Kimmeria, Pref. Xanthi, gallery, 2m, 1 ind., 16.5.1954 (LINDBERG, 1955); idem., 3m, 16.6.1989; idem., 1m, net, 23.6.1989; idem., 15 ind., 20.7.2000 (HANÁK et al., 2001) **[17];** Kimmeria, Pref. Xanthi, 1 km SE, 27.9.1966 (KOCK, 1974) **[18];** Toxotes, Pref. Xanthi, railway tunnel 2km NW, 7f, 20.9.1966 (SPITZENBERGER, 1996) **[19]**.

Original data:

BULGARIA: Belitsa, Shepran Dupka cave, 1m, net, 18.10.2001, BP, VB **[20]**; Borikovo, Borikovskata Peshtera cave, 1m, 19.3.2004, BP, TS **[1]**; Dobrostan, Ivanova Voda cave, a breeding colony, 27.6.2000; idem., 10m, 5f, net, 20.10.2001, BP, VB; idem., 1f, net, 5.4.2007, BP, IB; idem., 6m, 16f, net, 22.4.2007, BP, IB; idem., ca. 15m, 15f, net, 24.4.2007, BP; IB; idem., 25f, 22 lactating, net, 13.6.2008, BP; idem., 3f, net, 10.8.2009, BP, AH; idem., 14m, 2f, ad.+imm., net, 10.9.2008, BP; idem., 4f, net, 7.8.2010, SS, S. Deleva; idem, 1m, 2.10.2010, SS, S. Deleva **[2]**; Dyadovtsi, the bridge Dyadovksiya kemer, alt. 400m, 1m, net, 30.7.1999, BP, VB **[21]**; Gela, Lednitsata cave, 3m, net, 18.9.2005, BP **[3]**; Koshnitsa, Goloboitsa cave (upper entrance, Suhata), 1 ind., net, 19.7.2005, TI, IB **[22]**; Peshtera, Novata Peshtera cave (lower entrance), 1m, net, 1.7.2006, BP, PS **[10]**; Ribnovo, Manuilovata Peshtera cave, 1m, 3.3.2007, BP, IB **[23]**; Smilyan, Kraipatnata Peshtera cave, 1m, net, 11.07.1997, BP; idem., 1m, net, 15.7.2006, BP **[24]**; Velingrad, Suhata Peshtera cave, 1m, net, 27.6.2000, BP, PN **[25]**; Yagodina, Gorna Karanska Dupka cave, 1m, 4.6.2000, LN, BP **[26]**; Yagodina, Yagodinskata Peshtera cave, 1 m, 17.9.2005, BP **[16]**; Progled, Sbirkovata Peshtera cave, t=5.7°C , 6 ind. (1m, 2ff, 2 spec.) **[27]**.

GREECE: 3km N of Xanthi, the Turkish Bridge, alt. 200m, 1m, 6f, net, 19.6.2004, VH, CD, ID **[28]**; Melivia, Pref. Xanthi, four fords above the village, alt. 450 m, 1m, net, 6.9.2004, VH **[29]**.

To avoid formal disagreement with the current red lists and legislation in Bulgaria and Greece, we chose to maintain the name *Myotis blythii* (Tomes, 1857) instead of the recently introduced but still not widely accepted name *Myotis oxygnathus* Monticelli, 1885. The species was most commonly found roosting together with *M. myotis*. A large colony of *M. blythii* in the Westrern Rhodopes was found hibernating and breeding only in Ivanova Voda cave [2]. Presumably, part of the hibernating colony is migrating towards caves in the Eastern Rhodopes Mts. for breeding as it was found for *Myotis capaccinii* (see above). Considering the large territory of the studied region there is no doubt that other breeding colonies will be found in underground roosts, both in Bulgaria and Greece. The highest altitude where the species was found was 1610 m [3], the lowest was 50 m [19].

Large *Myotis myotis/blythii*

Original data:

BULGARIA: Borikovo, Borikovskata Peshtera cave, ca. 50 ind., 19.3.2004, BP, TS **[1]**; Dobrostan, Ahmetyova Dupka cave, 1 ind., 21.10.2001, BP, VB **[2];** Dobrostan, Ivanova Voda cave, ca. 4000 hibernating ind., t=4.5°C, 4.02.2006, BP, NS; idem., ca. 5600 ind., 1.4.2007, BP, IB; idem., 8f, 6 lactating, 26.6.2010, SS, S. Deleva **[3];** Kesten, Forgovo I cave, 3 ind., 18.09.2005, BP **[4]**; Koshnitsa, Goloboitsa cave (upper entrance, Suhata), 10 ind., 19.7.2005, TI, IB **[5];** Mostovo, Gargina Dupka cave, 28.2.2008, 1 ind., AH, V. Petrov **[6];** Peshtera, Novata Peshtera cave, 10 ind., 16.2.2008, BP **[7];**

Progled, Sbirkovata Peshtera cave, 3 ind., 16.3.2004, BP, TS **[8];** Ribnovo, Manuilovata Peshtera cave, 8 ind, 3.3.2007, BP, IB **[9];** Zabardo, Tyovnata Dupka cave, 1 ind., 20.3.2004, BP, TS **[10].**

Here we include observations of large "*Myotis*", which remained unidentified due to their inaccessibility or to avoid disturbance during hibernation or breeding.

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

Published data:

BULGARIA: Batak, Tsigov Chark, among fishermen cottages, 1m, net, 10.7.1981 (BENDA et al., 2003) **[1]**; Borino, Eminovata Peshtera cave, 1 subfossil ind., 6.11.1993, TI (BENDA et al., 2003) **[2]**; Gela, Lednitsata cave, 1m, net, 31.7.1971 (HORÁČEK et al., 1971, 1974) **[3]**;

Laki, rocks in the valley bellow the town, 1 ind. in pellets of *Strix aluco*, 27.4.1985 (OBUCH & BENDA, 1996) **[4];** Mogilitsa, Uhlovitsa cave, 1m, net, 20.7.1996, TI (BENDA et al., 2003) **[5]**; Orehovo, cave 100 m W of the village, 1m, net, 28.6.1984, T. Scholz, D. Král; idem., 2m, net, 29.6.1984, T. Scholz, D. Král (BENDA et al., 2003) **[6]**; Peshtera, Ushatovi Doupki cave, 1m, 4.2.1965 (HŮRKA, 1965) **[7];** Ribnovo, Manuilovata Peshtera cave, 1m, net, 22.6.2000, BP (BENDA et al., 2003) **[8]**; Velingrad, a cave ca. 400 m above Lepenitsa cave, 1m, net, 9.7.1981 (BENDA et al., 2003) **[9]**; Yagodina, Dolna Karanska Dupka cave, 1m, net, 16.8.1978 (BENDA et al., 2003) **[10]**; Yagodina, Sanchova Dupka cave, 1m imm., net, 3.8.1971 (HORÁČEK et al., 1971, 1974) **[11];** Yagodina, Yagodinskata Peshtera cave, 2m, net, 2.8.1971 (HORÁČEK et al., 1971, 1974) **[12]**.

GREECE: Galani, Pref. Xanthi, cave, 9 pregnant females, net, 23.6.1989 (HANÁK et al., 2001) **[13].**

Original data:

BULGARIA : Smilyan, Kraipatnata Peshtera cave, 1m, net, 11.7.1997, BP **[14];** Yagodina, Gorna Karanska Dupka cave, 1m, net, 12.7.1997, BP ; idem., 1m, net, 4.8.1997, BP **[15] ;** Yagodina, Yagodinskata Peshtera cave, natural entrance, 1m, 1f, net, 3.8.1997, BP **[12]**; Byal Izvor (Cholakovo), net above the river Ovadzhika, alt. 600m, 1f, 5.8.1999, BP, VB **[16]**.

GREECE: Paranesti, Pref. Drama, alt. 100m, 1f, net, 3.9.1984, RW **[17]**.

The species is relatively common in Bulgaria and Greece, occurring in both natural habitats and human settlements (BENDA et al., 2003; HANÁK et al, 2001). No maternity colonies have so far been discovered in the study area, but nine pregnant females were captured at a cave entrance [13] in Greece. The highest altitude where the species was found was 1610m [3] (high altitude record for Bulgaria), the lowest was 70 m [13].

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

Published data:

BULGARIA: Assenovgrad, Asenova Krepost, 6.6.1957 (HANÁK & JOSIFOV, 1959) **[1]**; Dobrostan, Lednitsata cave, 1 ind., 9.4.1978 (NOWOSAD et al., 1987) **[2];** Dobrostan, Ivanova Voda cave, obs. colony, 1m, net, 23.7.1979; idem., obs. ca. 200 ind., 20.5.1998, TI, BP; idem., 11m, 1f, net, 24.7.1998; idem., 1m, net, 27.6.2000, BP (BENDA et al., 2003) **[3]**; Laki, rocks in the valley bellow the town, 1 ind., in pellets of *Strix aluco*, 27.4.1985 (OBUCH & BENDA, 1996) **[4];** Mostovo, Gargina

Dupka cave (BERON, 1964b); idem., 21.8.1959 (BERON & KOLEBINOVA, 1964); idem., 3m, 20.5.1975; idem., 56m, 4f, 1 ind., 13.9.1977; idem., 1m, 1 ind., 4.4.1978; idem., 16 ind., 4.5.1978; idem., 1 ind., 7.5.1978; idem., 1 ind., 4.6.1978; idem., 2 ind., 6.6.1978; idem., 3 ind., 16.6.1978; idem., 17 ind., 6.7.1978 (NOWOSAD et al., 1987); idem., obs. ca. 10000 ind., 31.1.1989 (BESHKOV, 1993); idem., obs. large colony, 4m, 5f, net, 22.6.1984, T. Scholz, D. Král; idem., 2m, 3f, net, 22.8.1987; idem., 24m, 5f, net, 4.8.1995, P. Munclinger; idem., obs. ca. 1000 ind., 21.2.1997, TI; idem., ca. 600 ind., 7.2.1998, BP, TI; idem., obs. 200 ind., 21.5.1998, TI; idem., obs. colony of ca. 1000 ind., 25.7.1998, TI; idem., obs. 280 ind., 29.12.1999; idem., obs. ca. 1000 ind., 29.6.2000, BP, PN (BENDA et al., 2003) **[5]**; Orehovo, cave 100 m W of the village, 3m, net, 28.6.1984, T. Scholz, D. Král (BENDA et al., 2003) **[6]**; Orehovo, cave in a quarry, 1m, net, 24.8.1980 (BENDA et al., 2003) **[7]**; Ravnogor, Pavla cave, idem., 1000 ind., 30.9.2006, SS, DG; idem., 200 ind., 27.8.2007, SS, DG; idem., 2000 ind., 16.3.2008, SS, DG (STOYCHEVA, 2008) **[8];** Peshtera, Ushatovi Dupki cave, 1 ind., 27.3.1978 (NOWOSAD et al., 1987); idem., nurs. Colony of 50-100 ind., 15.8.1985 (GRIMMBERGER, 1993); idem., 4 ind., 8.8.1967 (BENDA et al., 2003) **[9]**; Ribnovo, Manuilovata Peshtera cave, 14.5.1959 (BERON & GUÉORGUIEV, 1962, BESHKOV, 1993); idem., ca. 1200 ind., Oct. 1988; idem., several thousands ind., Oct. 1989 (BESHKOV 1993); idem., 5 ind., 14.2.1998, BP, TI; idem., 2m, 1f, net, 22.6.2000, BP (BENDA et al., 2003) **[10]**; Trigrad, Dyavolskoto Garlo cave, ca. 400 ind., June 1977 (BESHKOV, 1998); idem., ca. 6500 ind., March 1989; idem., 10250 ind., Nov. 1989 (BESHKOV, 1993); idem., ca. 7000 ind., 4.11.1989; idem, ca. 11000 ind., 29.1.1995; idem., 8m, 2f, net, 23.6.1996; idem., ca. 27000 ind., 13.2.1998, TI, BP; idem., ca. 300 ind., 21.9.1998; idem., ca. 40800 ind., 27.12.1999, TI; idem., 18m, 2f, net, 29.6.2000, BP; idem., ca. 1000 ind., 14.9.2000; idem., 12000 ind., 2.12.2000, TI (BENDA et al., 2003) **[11]**; Velingrad, Suhata Peshtera cave, 1m, net, 5.6.2000, BP; idem., 6m, net, 27.6.2000, BP, PN (BENDA et al., 2003) **[12]**.

GREECE: Kimmeria, Pref. Xanthi, gallery, 2m, 2f, net, 16.6.1989; idem., 20 ind., 20.7.2000 (HANÁK et al., 2001) **[13].**

Original data:

BULGARIA: Belitsa, the natural bridge below the village, 1f, net over the river, 7.10.2005, TI, IB, BP **[14]**; Gospodintsi, Zlatarskata Peshtera cave, 13 ind., t=13ºC, 17.11.2006, BP **[15]**; Dobrostan, Ivanova Voda cave, 1m, 1f, net, 24.4.2007, BP, IB; idem., 1m, 1.5.2007, BP, IB; idem., 6m, 1f, net, 13.6.2008, BP; idem., 6m, 1f, net, 10.8.2008, BP, AH; idem, 11m, 6f, net, 10.9.2008, BP; idem., 6m, 3f, net, 7.8.2010, SS, S. Deleva; idem., 4m, 8f, net, 2.10.2010, SS, S. Deleva **[3];** Koshnitsa, Goloboitsa cave (upper entrance, Suhata), 40 ind., 19.7.2005, TI, IB; idem., ca. 40 ind., 13.7.2006, BP; idem., 3 ind., 15.6.2008, BP **[16]**; Mostovo, Borovskata Vodna Peshtera cave, 2 skulls, 21.10.2001, BP, VB **[17];** Mostovo, Gargina Dupka cave, obs. colony, March 1968, VB; idem., colony, July 1971, VB; idem., colony, July 1988, VB; idem., colony, April 1994, VB; idem., colony, 1.12.1990, BP; idem., 6 ind., 20.10.2001, BP, VB; idem., 600-800 ind., 13.6.2008, BP; idem., 800-1000 ind., 10.8.2009, AH; idem., 450 ind., many ind. in copulation, 10.9.2008, BP; idem., ca. 3000 ind., 11.4.2010, SS, S. Deleva; idem., ca. 1500-2000 ind., 10m, 27.7.2010, SS, S. Deleva; idem., 29m, 6f, 1f post-lactating, net, 8.8.2010, SS, S. Deleva; idem., ca. 4000 ind., 23m, 11f, net, 3.10.2010, SS, S. Deleva **[5]**;

Peshtera, Ushatovi Doupki cave, 1m, net, 8.6.2006, BP **[9]**; Peshtera, Novata Peshtera cave, 20-30 ind., 19.10.2009, DG **[18];** Ravnogor, Pavla cave, 200 ind., 27.8.2007, SS, DG; idem., 400 ind., 24.8.2008, SS, DG; idem., 500 ind., 20.9.2008, SS, DG; idem., 2 skulls, 9.11.2008, S. Deleva leg., SS det.; idem., ca. 100 ind., 21.11.2009, SS, DG **[8]**; Ribnovo, Manuilovata Peshtera cave, ca 100 ind., net, 29.4.1994, BP; idem., 800 ind. near the entrance, t=9ºC, 18.11.2006, BP; idem., 130 ind., t=6ºC, 3.3.2007, BP, IB; idem., 10 ind., 10.10.2010, BP, T. Georgieva **[10]**; Ribnovo, Skoka cave, 1 ind., t=13ºC, 18.11.2006, BP **[19]**; Trigrad, Dyavolskoto Garlo cave, ca. 35000 ind., 21.12.2003, BP; idem., 22500 ind., 4.3.2007, BP; idem., 28800 ind., 16.2.2008, BP; idem., 42m, 1f, net, ca. 1500-2000 ind. flying at the entrance, visual count, 16.6.2008, BP; idem, ca. 1500 flying at the entrance, 11m, 1f, net, 13.8.2008, BP, AH; idem., ca. 1000 flying at the entrance, 13m, 6f, 13.9.2008, BP; idem., min. count 26580, max. count 28000, t=7.1ºC, 10.1.2010, BP; idem., 3m, net, 23.5.2010, BP, SS; idem., 12m, 4f, net, 11.9.2010, BP, V. Karadakov **[11]**; Trigrad, Trigradski Skali Hut, alt. 1140m, 10m, net above the river Trigradska Reka, 5.8.1997, BP **[20];** Velingrad, Suhata Peshtera cave, 15 ind, 26.11.1993, BP, PS; idem., 2m, 1f pregnant, net, 30.6.2006, BP, PS **[21]**.

GREECE: Nestos River near Sidironero, Pref. Drama, alt. 450m, 2m, net, 6.9.1983, RW **[22]**; Paranesti, Loutra Thermia, Pref. Drama, alt. 370m, several flying ind., 2.9.1997, VH **[23]**; Paradisos, Pref. Kavala, cave in the military area, alt. 50m, 1m, 30.3.1997, Rottmann; idem, 2f, net, 7.9.2001, A. Kiefer **[24]**; Galani, Pref. Kavala, unnamed cave in the gorge of Nestos River, alt. 60m, 1 subfossil, 29.3.1997, Rottmann; idem., 1 subfossil, 14.9.1997, Rottmann **[25]**; Ford of Kompsatos River between Medousa and Kotani, Pref. Xanthi, alt. 320m, 1m, net, 18.6.2004, VH, CD, ID; idem., 1m, net, 4.9.2004, VH **[26]**.

Although there are many records of this species, only a few localities are important in the Western Rhodopes. In summer, the only large maternity colony has been found in Gargina Dupka cave [5]. There are no recent mist-nettings at this cave, which would provide proofs that the observed summer colonies in the last 15 years are in fact maternity or not. A non-reproductive summer colony of ca. 1000-2000 individuals roosts in Dyavolskoto Garlo Cave [11]. Captures during the summer indicate that this colony consists of males- 3♂♂ in May 2010; 8♂♂/2♀♀ in June 1996; 18♂♂/2♀♀ in June 2000; 42♂♂/1♀ in June 2008; 11♂♂/1♀ in August 2008), with females starting to turn back for hibernation in September (13♂♂/6♀♀, 2008; 12♂♂/4♀♀, 2010). The capture of a pregnant female in Suhata Peshtera cave [12] suggests the existence of a breeding colony, but its exact roost has not yet been discovered. Pavla cave [8] is an important migratory stopover roost, occupied for short periods both in spring and during the autumn.

In winter, large colonies have been found in three caves in the Bulgarian part of the mountains: Manuilovata Peshtera cave [10], Gargina Dupka cave [5] and Dyavolskoto Garlo Cave [11]. The latter is the second largest hibernaculum of this species in Bulgaria and the most important in the study area. Each winter, a colony of an average 20 000 to 40 800 individuals hibernates in the largest underground hall found in Bulgarian caves. This number is far exceeding the number of bats in all known summer colonies found so far in Southern Bulgaria and Northern Greece (BENDA et al., 2003; HANÁK et al., 2001; IVANOVA & GUEORGUIEVA, 2004). Considering the long-distance

movements known so far from the Central Balkans, i.e. 118 km in Bulgaria (BERON, 1963) and 235 km in Serbia (PAUNOVIC & KARAPANDZHA, 1999), we can assume that transboundary migrations are possible within a 100÷120 km radius and even beyond this range (Fig. 2; cf. GARIN et al. 2008). Presumably, Dyavolskoto Garlo Cave is used for hibernation by bats living in a wider area in this part of the Balkan Peninsula. We

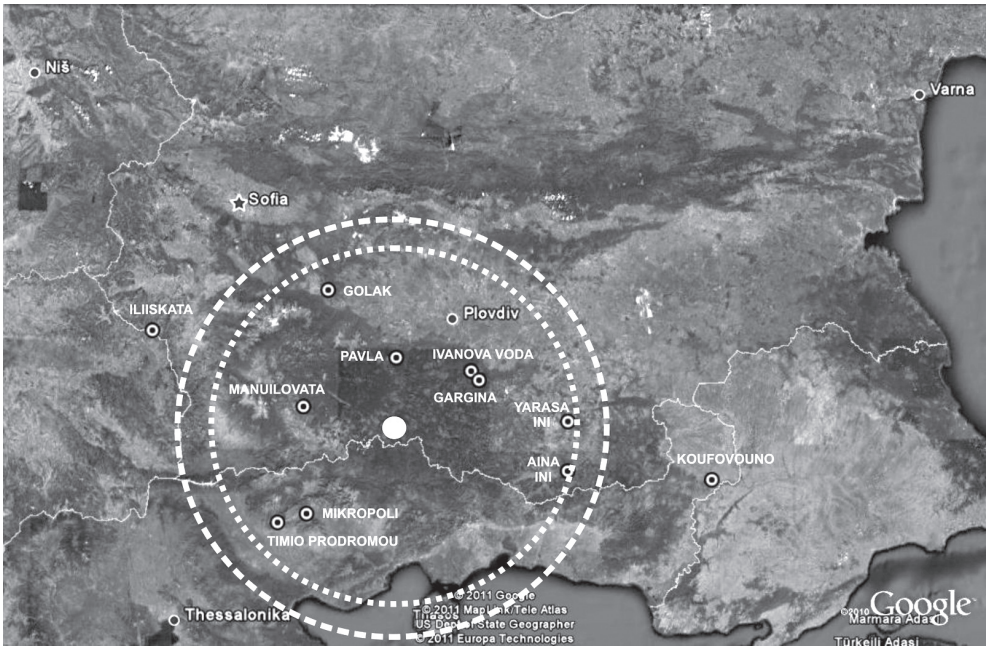

Fig. 2. Map of the most important summer, winter and transient roosts of *Miniopterus schreibersii* within 100 km and 120 km radius from Dyavolskoto Garlo Cave (data after BENDA et al. (2003), IVANOVA & GUEORGUIEVA (2004), HANÁK et al. (2001), own data).

have found a very high number of individuals, which suggests that the cave is shelteting bats from different summer colonies roosting in Bulgaria, northern Greece and perhaps in the eastern parts of Republic of Macedonia.

No summer or winter colonies of this species have so far been discovered in the Greek part of the Western Rhodopes. However, both summer and winter colonies are known from several caves in the adjacent Eastern Rhodopes (cf. IVANOVA & GUEORGUIEVA, 2004) and Menikio Mt. (Fig. 2; HANÁK et al., 2001). The highest altitude where the species was found was 1345m [2], the lowest was 50 m [24].

***Pipistrellus pipistrellus* (Schreber, 1774) s.l.**

Published data:

BULGARIA: Assenovgrad, Petrol Station 1km S of the sity, several flying ind., detector, 46.2 kHz, 24.3.2007, SS, DG (STOYCHEVA 2008) **[1]**; Assenovgrad, above Chaya River in the town, detector, 48.1-50.5 kHz, 24.3.2007, SS, DG (STOYCHEVA, 2008) **[2]**; Batak, Tsigov Chark Resort, alt. 1130m, roof of a house, obs. colony of 103 ind., 45f lactating, net, 9.7.1981 (BENDA et al., 2003) **[3]**; Mogilitsa, Uhlovitsa cave, 1

ind., visual count, 31.12.2002, TI (BENDA et al., 2003) **[4]**; Mostovo, Gargina Dupka cave, 1 ind., 4.5.1978 (NOWOSAD et al., 1987) **[5]**; Mostovo, house in the village, 1 ind., July 1971 (not in Gargina Dupka cave as in BERON, 1994) **[6];** Shiroka Laka, above a brook in the village, 1m, 14.8.1978 (BENDA et al., 2003) **[7]**; Yagodina, brook near Yagodinskata Peshtera cave, 1f, net, 15.8.1978 (BENDA et al., 2003) **[8]**.

GREECE: Skaloti, Pref. Drama, alt. 950m, 1m, 1985 (VOLLETH, 1987) **[9];** Xanthi, on the road at 8km NW from the town, 1m, 17.6.1989 (HANÁK et al., 2001) **[10].**

Original data:

BULGARIA: Ardino, Belite Brezi Hut, alt. 966m, 1m, under a wooden cover, 13.8.2008, BP, AH; idem., 1m, 1 mummy, 12.9.2008, BP **[11]**; Batak, Tsigov Chark Resort, 1f, juv., 25.7.2009, E. Tilova **[3]**; Belitsa, the natural bridge below the village, 1m, net over the river, 30.8.2001, BP, VB **[12]**; Mogilitsa, bridge over a river in the village, 1f, net, 22.7.2005, TI, IB **[13]**.

GREECE: Paranesti, Loutra Thermia, Pref. Drama, alt. 370m, many flying ind. at 45 KHz, visual count and detector, 2.9.1997, VH **[14]**; Mouth of Arkoudorrema River near Paranesti, Pref. Drama, many flying ind., visual count, 19.8.1997, VH; idem., many flying ind., visual count, 3.9.1997, VH **[15]**; Paradisos, Pref. Kavala, cave in the military area, alt. 50m, many flying ind. at 45 KHz, detector, 7.9.2001, A. Kiefer **[16]**; Kato Thermes, Pref. Xanthi, near a bridge and a spring above the village, alt. 500 m, 2m, net, 5.9.2004, VH **[17]**; Ford of Kompsatos River between Medousa and Kotani, Pref. Xanthi, alt. 320m, 1 ind., net, 4.9.2004, VH **[18]**.

Pipistrelle bats are amongst the most common species found in human settlements and man-made structures both in Bulgaria and Greece. The abundance of this species is much greater in the villages compared to the observations and captures carried out in natural habitats. The highest record is at 1130m [3], the lowest is at 50 m [16].

Pipistrellus pygmaeus **(Leach, 1825)**

Published data:

BULGARIA: Assenovgrad, Petrol Station 1km S of the sity, several flying ind., detector, 54,1 kHz, 24.3.2007, SS, DG (STOYCHEVA, 2008) **[1]**; Ravnogor, meadows along a small river near the village, alt. 1273m, 54.7 kHz, detector, 25.8.2007, SS, DG (STOYCHEVA, 2008) **[2]**; Ravnogor, above a house in the village, alt. 1381m, detector, 56.5 kHz, 27.8.2007, SS, DG (STOYCHEVA, 2008) **[3]**.

Original data:

GREECE: Paranesti, Loutra Thermia, Pref. Drama, alt. 370m, 2m, net, many flying ind., 55 KHz, visual count and detector, 2.9.1997, VH **[4]**; Mouth of Arkoudorrema River near Paranesti, Pref. Drama, alt. 140 m, 3 ind., net and detector, 18.8.1997, VH; idem., many flying ind., visual count, 19.8.1997, VH **[5]**; River ford between Melivia, Kotili and Dimari, Pref. Xanthi, alt. 490 m, 1m, net, 17.6.2004, VH, CD, ID **[6]**; Kompsatos River near the volcanic cave between Kato Thermes and Termiko Loutraki, Pref. Xanthi, alt. 400 m, 1m, 1f, net, 5.9.2004, VH **[7]**; Kato Thermes, Pref. Xanthi, near a bridge and a spring above the village, alt. 500m, 2m, net, 5.9.2004, VH **[8]**; Ford of Kompsatos River between Medousa and Kotani, Pref. Xanthi, alt. 320m, many flying ind., 56 KHz, visual count and detector, 18.6.2004, VH, CD, ID; idem., 10m, 6f, net, 4.9.2004, VH **[9]**.

Data from the Bulgarian part of the mountains are scarce. The species has never been captured in mist-nets or found in underground roosts. The only acoustic field survey carried in Bulgaria revealed that it occurs together with *P. pipistrellus* only in one locality (STOYCHEVA, 2008). In Greece, the species was captured in mist-nets and found with detectors in variety of natural and anthropogenic habitats. However, there are still no data about its relative abundance in the localities [e.g. 1, 4, 5, 10] shared together *P. pipistrellus*. The highest altitude where the species was found was 1381m [3], the lowest was 140 m [5].

***Pipistrellus nathusii* (Keyserling et Blasius, 1839)**

Published data:

GREECE: Dipotama, Pref. Drama, alt. 450 m, 2m, 2f, net over a creek near Arkoudorrema River, 21.10.1988 (HELVERSEN & WEID, 1990) **[1];** Paranesti, Pref. Drama, 15 km N of the village, alt. 450m, 1m, net over a creek, 20.10.1988, RW, Geiger, Wiedinger (HELVERSEN & WEID, 1990) **[2];** Xanthi, on the road at 8km NW from the town, alt. 200m, 1f pregnant, net, 17.6.1989 (HANÁK et al., 2001) **[3].**

Original data:

GREECE: 3 km N from Melivia, Pref. Xanthi, alt. 450 m, 1m, net, 17.6.2004, VH, CD, ID **[4]**; River ford between Melivia, Kotili and Dimari, Pref. Xanthi, alt. 490 m, 1m, net, 17.6.2004, VH, CD, ID **[5]**.

The species has so far been confirmed only in the Greek part of the study area. Although its occurrence in the Balkans is supposed to be a seasonal phenomenon, the presence of a pregnant female in June suggests a possible permanent population in the wooded mountain areas (HANÁK et al., 2001). Occurrence of the species in the Bulgarian Eastern Rhodopes Mt. was just recently confirmed by a detector (PANDOURSKI & POPOV, 2009). The highest altitude where the species was found was 450 m [1, 2, 4], the lowest was 200 m [3].

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

Published data:

BULGARIA: Bachkovo, 1 km S of the Monastery, 1m, 14.6.1960 (BERON, 1961) **[1]**; Borino, Eminovata Peshtera cave, 2 subfossil ind., 6.11.1993, TI (BENDA et al., 2003) **[2]**; Orehovo, cave 100 m W of the village, 1m, net, 24.8.1980; idem., 1m, net, 29.6.1984, T. Scholz, D. Král (BENDA et al., 2003) **[3]**; Orehovo, cave in a quarry, 1 ind., net, 24.8.1980; idem., 4m, net, 25.8.1980 (BENDA et al., 2003) **[4]**; Ravnogor, meadows along a small river near the village, alt. 1273 m, 33.2 kHz, detector, 25.8.2007, SS, DG (STOYCHEVA, 2008) **[5]**; Yagodina, Dolna Karanska Dupka cave, 7m, 2f imm., net, 16.8.1978 (BENDA et al., 2003) **[6]**.

GREECE: Galani, Pref. Xanthi, cave, 1 pregnant female, net, 23.6.1989 (HANÁK et al, 2001) **[7]**.

Original data:

BULGARIA: Dzhurkovo, disused mine gallery, 1m, net, 19.10.2001, BP, VB **[8];** Laki, disused mine gallery, 2m, net, 9.10.2005, BP, TI, IB **[9];** Mihalkovo, the junction to Stomanevo, in abandoned house, 3m, caught by hand, 1.9.2001, BP, VB **[10];** Yagodina, Gorna Karanska Dupka cave, 1m, 1f, net, 4.8.1997, BP **[11]**.

GREECE: Sidironero, Pref. Drama, alt. 500, 1 ind., 24.6.1984, RW **[12]**; near

Nestos River, Paranesti, Dist. Drama, alt. 180m, 1m, 1f, net, 15.6.1984, VH, RW; idem., several ind., visual count, 20.6.1987, Liegl, Meschede, Weber; idem., several ind., 19.10.1988, RW, Geiger, Wiedinger **[13]**; Paranesti, Pref. Drama, 150m, 1m, 1f, net, 15.6.1984, RW; idem., 1m, net, 3.9.1984, RW; idem, 1f, net, 24.9.1984, RW **[14]**; Mouth of Arkoudorrema River near Paranesti, Pref. Drama, several flying ind., 19.8.1997, VH; idem., several flying ind., 31.8.1997, VH.; idem, several flying ind., 3.9.1997, VH **[15]**; Paradisos, Pref. Kavala, cave in the military area, alt. 50m, 1m, net, 7.9.2001, A. Kiefer **[16]**; Ford of Kompsatos River between Medousa and Kotani, Pref. Xanthi, alt. 320m, 1f, net, 18.6.2004, VH, CD, ID **[17]**.

The species is common in many Bulgarian and Greek settlements (BENDA et al., 2003; HANÁK et al., 2001). In natural conditions, it usually occurs in rocky habitats such as narrow gorges and canyons with exposed rocks. There are no data about wintering and breeding colonies of this species in the Western Rhodopes. The highest altitude where the species was found was 1273m [5], the lowest was 50 m [16].

***Nyctalus lasiopterus* (Schreber, 1780)**

Published data:

BULGARIA: Buynovo, net above the Buynovska Reka river, alt. 1250m, 1 ind., 19.8.1995 (PANDURSKA & BESHKOV, 1998) **[1].**

GREECE: Paranesti, Pref. Drama, Arkoudorrema River mouth at 3km NW from the village, alt. 140 m, 1m, net, 23.6.1984, RW (HELVERSEN & WEID, 1990) **[2];** Paranesti, Pref. Drama, Zagradenia Forest, alt. 1000 m, 10-15 ind., visual count, 1.6.1984, RW (HELVERSEN & WEID, 1990) **[3].**

Original data:

GREECE: Paranesti, Pref. Drama, Arkoudorrema River mouth at 3km NW from the village, alt. 140 m, 1f, net, 30.8.1997, VH **[2]**; Ford of Kompsatos River between Medousa and Kotani, Pref. Xanthi, alt. 320m, 1f, net, 15.6.2004, VH, CD, ID; idem., 1f, net, 4.9.2004, VH **[4]**.

The species is among the most rarely encountered bats in Bulgaria and Greece (BENDA et al., 2003; HANÁK et al, 2001). The few known records hardly reflect its actual distribution and abundance within the study area considering the broad coverage of forest habitats. The highest altitude where the species was found was 1250m [1], the lowest was 140m [2].

***Nyctalus leisleri* (Kuhl, 1817)**

Published data:

GREECE: Dipotama, Pref. Drama, Arkoudorrema River, alt. 450 m, 1m, net, 30.8.1987 (HELVERSEN & WEID, 1990) **[1];** Sidironero, Nestos River, 1m, 6.9.1983 (HELVERSEN & WEID, 1990) **[2];** Xanthi, on the road at 8km NW from the town, 1m, net, 25.6.1989 (HANÁK et al, 2001) **[3].**

Original data:

BULGARIA: Belitsa, the natural bridge below the village, 1m, net over the river, 7.10.2005, TI, IB, BP **[4];** Koshnitsa, net over Arda River below Kaleto cave, alt. 840m, 1 ind., 19.7.2005, TI, IB **[5].**

GREECE: Paranesti, Pref. Drama, Arkoudorrema River mouth at 3km NW from the village, alt. 140 m, several ind., visual count, 3.9.1997, VH **[6]**; Melivia, Pref. Xanthi,

four fords above the village, alt. 450 m, 1m, net, 6.9.2004, VH **[7]**; River ford between Melivia, Kotili and Dimari, Pref. Xanthi, alt. 490 m, 1m, net, 17.6.2004, VH, CD, ID **[8]**; Kato Thermes, Pref. Xanthi, near a bridge and a spring above the village, alt. 500 m, 1m, net, 5.9.2004, VH **[9]**; Ford of Kompsatos River between Medousa and Kotani, Pref. Xanthi, alt. 320m, 1m, net, 18.6.2004, VH, CD, ID; idem., 6m, 1f, net, 4.9.2004, VH **[10]**.

The number of records (especially in Bulgaria) is surprisingly low considering the great coverage of deciduous and mixed forests in the study area. Findings from Greece (n=8) and Bulgaria (n=2) confirm the chorological data published for both countries (BENDA et al., 2003; HANÁK et al, 2001). Out of 16 captured individuals, only two were females [10]. Breeding of the species on the Balkans has not yet been confirmed (STRELKOV, 2000). The highest record is at 840m [4], the lowest is at 140 m [6].

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

Published data:

BULGARIA: Laki, rocks in the valley bellow the town, 11 ind. in pellets of *Strix aluco*, 27.4.1985 (OBUCH & BENDA, 1996) **[1]**; Orehovo, 1958–1961 (BACHVAROV, 1963) **[2];** Peshtera, 1958–1961 (BACHVAROV, 1963) **[3]**; Hvoyna, E of the village, above Chaya River, alt. 650m, 1 ind., net, 12.10.2002, E. Tilova (TILOVA et al., 2005) **[4]**.

Original data:

BULGARIA: Mihalkovo, the junction to Stomanevo, tunnel, 1f, net, 1.9.2001, BP, VB **[5]**; Madan, Pechinsko mining area, 1 flying, detector, 3.10.2008, BP, AH **[6]**.

GREECE: Nestos River near Sidironero, Pref. Drama, alt. 450, 1m, 2f, net, 6.9.1983, RW **[7]**; Paranesti, Loutra Thermia, Pref. Drama, alt. 370m, 1m, net, 2.9.1997, VH **[8]**; Paranesti, Pref. Drama, Arkoudorrema River mouth at 3km NW from the village, alt. 140 m, several flying ind., 16.10.1988, RW, Geiger, Wiedinger; idem., 1m, 1f, net, 30.8.1997, VH; idem., many flying ind., 3.9.1997, VH **[9]**; Paranesti, Pref. Drama, Zagradenia Forest, alt. 1000 m, many flying ind., 20.8.1997, VH **[10]**; Paradisos, Pref. Kavala, cave in the military area, alt. 50m, 3f, net, 13.9.1997, Rottmann **[11]**; Ford of Kompsatos River between Medousa and Kotani, Pref. Xanthi, alt. 320m, 6m, net, 15.6.2004, VH, CD, ID; idem., 4m, net, 18.6.2004, VH, CD, ID; idem., 5m, 7f, net, 4.9.2004, VH **[12]**.

The majority of the records from Bulgaria come from potential migration corridors (e.g. river valleys, coastal line), urban areas or extensive wooded regions (BENDA et al., 2003). Greece lies at the southern border of the species' geographical distribution and the limited number of records are unevenly spread in the central and northern parts of the country (HANÁK et al., 2001). Correct identification of noctule bats in flight is often complicated, thus with few exceptions [e.g. 6, 10], our data come only from captured individuals. Nearly all captures and observations in the Rhodopes Mts. were made in September and October, which supports the previously known increase of records during the autumn (STRELKOV, 2000; BENDA et al., 2003). We do not provide new data neither for breeding nor for hibernation of the species in the Western Rhodopes. The highest altitude where the species was found was 1000m [2, 10], the lowest was 50m [11].

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

Published data:

BULGARIA: Mogilitsa, Uhlovitsa cave, 2m, net, 20.7.1996, TI (BENDA et al., 2003) **[1];** Orehovo, cave 100 m W of the village, 1m , net, 25.8.1980 (HANÁK et al., 2001, BENDA & IVANOVA, 2003); idem., 3m, net, 28.6.1984, T. Scholz, D. Král (HANÁK et al., 2001, BENDA & IVANOVA, 2003); idem., 1m, net, 29.6.1984, T. Scholz, D. Král (HANÁK et al., 2001, BENDA & IVANOVA, 2003) **[2]**; Orehovo, cave in a quarry, 2m, net, 24.8.1980 (HANÁK et al., 2001, BENDA & IVANOVA, 2003) **[3];** Perushtitsa, rocky gate, 1 ind., in pellets of *Strix aluco*, 28.4.1985 (OBUCH & BENDA, 1996) **[4];** Ravnogor, in a yard with *Picea excelsa* near a house in the village, alt. 1381m, 1f, net, 26.9.2005, SS, DG (TILOVA et al., 2005) [**5**]; Velingrad, Suhata Peshtera cave, 1m, net, 27.6.2000, BP, PN (BENDA et al., 2003) **[6];** Yagodina, Dolna Karanska Dupka cave, 1m, net, 16.8.1978 (HANÁK et al., 2001, BENDA & IVANOVA, 2003) [**7**].

Original data:

BULGARIA: Belitsa, Shepran Dupka cave, 1m ad., 1m imm., net, 18.10.2001, BP, VB **[8];** Dzhurkovo, disused mine gallery, 1m, net, 19.10.2001, BP, VB **[9];** Mihalkovo, disused mine gallery, alt. 700m, 1 ind., 1.9.2001, BP, VB **[10];** Mihalkovo, the junction to Stomanevo, abandoned building, 1 ind., 1.9.2001, BP, VB **[11];** Mogilitsa, bridge over a river in the village, 1f lactating, net, 14.7.2006, BP **[12];** Velingrad, Lepenitsa cave, 1 ind, 25.11.1993, BP, PS **[13];** Yagodina, Gorna Karanska Dupka cave, 1m, net, 4.8.1997; idem., 1m, 4.6.2000, LN **[14];** Yagodina, Yagodinskata Peshtera cave, net at the natural entrance, 1m, 3.8.1997, BP **[15].**

GREECE: Paradisos, Pref. Kavala, cave in the military area, alt. 50m, 2m, 13.9.1997, Rottmann; idem, 7m, net, 7.9.2001, A. Kiefer **[16]**; 3km N of Xanthi, the Turkish Bridge, alt. 200m, 1m, net, 19.6.2004, VH, CD, ID **[17]**.

Western Rhodopes offer suitable habitat to this originally lowland's species (cf. BENDA & IVANOVA, 2003). It has been captured in the periphery and within the central parts of the study area. No colonies have been found yet, but the captures of lactating females [12] and immature individuals [8] indicate the existence of maternity colonies in the area. The highest altitude where the species was found was 1381m [5], the lowest was 50 m [16].

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

Published data:

BULGARIA: Chepelare, Samurski Doupki cave, 1m, net, 30.7.1971 (HORÁČEK et al., 1971, 1974) **[1]**; Gela, Lednitsata cave, 1m, net, 1 recent and 6 subrecent skeletons, 31.7.1971 (HORÁČEK et al., 1971, 1974); idem., 4m, 1m imm., 2f imm., net, 13.8.1978 (HŮRKA, 1984; HANÁK et al., 2001, BENDA & IVANOVA, 2003) **[2];** Orehovo, cave in a quarry, 1m, net, 25.8.1980 (HANÁK et al., 2001; BENDA & IVANOVA, 2003) **[3]**; Pamporovo Resort, Stoykite, 1 ind., 21.8.1958 (BERON, 1964) **[4]**; Peshtera, Lilova Skala cave, 1m, 15.8.1985 (GRIMMBERGER, 1993) **[5]**; Yagodina, Dolna Karanska Dupka cave, 1m, net, 16.8.1978 (HANÁK et al. 2001; BENDA & IVANOVA, 2003) **[6]**; Yagodina, Yagodinskata Peshtera cave, 2m, 26.10.2002, R. Lučan (BENDA et al., 2003) **[7].**

Original data:

BULGARIA: Ardino, Belite Brezi Hut, alt. 960m, a small colony behind a window's cover, 1 ind. photographed, August 2006, V. Krumov **[8];** Dzhurkovo, disused mine gallery, 2m, net, 8.10.2005, BP, TI, IB **[9];** Gela, Lednitsata cave, 5m, 1f, net, 18.9.2005, BP **[2];** Laki, disused mine gallery, 1m, net, 9.10.2005, BP, TI, IB **[10]**; Orehovo, Modarskata Peshtera cave, 2m, 2f, net, 26.9.1994, BP **[11];** Progled, Sbirkovata Peshtera cave, 1m, net, 6.8.1999, BP, VB **[12];** Varba, water derivation gallery, 1m, net, 5.10.2009, BP, AH **[13].**

The occurrence of the species in the Rhodopes conforms with previous data known in general from Bulgaria (BENDA et al., 2003). Nearly all records come from the swarming period when males and females meet at local underground roosts in coniferous and mixed forests. The lack of data from the Greek part of the mountains may be due to the limited number of captures at caves and galleries in September and October. However, it is likely that the species occurs on the Greek side, given the suitable habitats along the border with Bulgaria. The highest altitude where the species was found was 1635m [11], the lowest was 730 m [5].

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

Published data:

BULGARIA: Borino, Kastrakli Reserve, over road, alt. 1100m, 1f, net, 11.8.2002 (BENDA et al., 2003) **[1];** Gela, Lednitsata cave, 1m, net, 31.7.1971 (HORÁČEK et al., 1971, 1974) **[2]**; Peshtera, Lilova Skala cave, 1m, 5.2.1965 (BENDA et al., 2003) **[3];** Ribnovo, Manuilovata Peshtera cave, 1 ind., 10.2.1998, BP, TI; idem., 1m, net, 22.6.2000, BP (BENDA et al., 2003) **[4];** Velingrad, Lepenitsa cave, 1m, 17.12.1961 (BESHKOV & BERON, 1962; YANCHEV & STOYKOVA, 1973) **[5]**.

Original data:

GREECE: Paranesti, Loutra Thermia, Pref. Drama, alt. 370m, 1m, net, 2.9.1997, VH **[6]**; between Silli and Dipotama, Pref. Drama, alt. 540m, 1m, net, 21.7.1996, Heddergott **[7]**.

The mountain offers vast territories covered with humid coniferous and mixed woodlands, which are considered as the most suitable habitats for this species in the Balkans (PANDURSKA & IVANOVA, 2003). However, it has only been found in only five localities in the Bulgarian part and only two in the Greek part. The highest altitude where the species was found was 1610m [2], the lowest wast 370 m [6].

***Vespertilio murinus* Linnaeus, 1758**

Published data:

BULGARIA: Arda, in the village, alt. 1000m, display behaviour of ca. 10 ind. Around lamps, detector and visual count, 1.11.2003, TI (BENDA et al., 2003) **[1];** Orehovo, cave 100 m W of the village, 1m, net, 29.6.1984, T. Scholz, D. Král (BENDA et al., 2003) **[2];** Pamporovo Resort, Hotel Murgavets, display behaviour of ca. 20 ind. around the building, detector and visual count, 25–26.9.2003 (BENDA et al., 2003) **[3];** Yagodina, on the road Yagodina–Buynovo, alt. 1200 m, 1m, 27.9.2003 (BENDA et al., 2003) **[4]**

GREECE: At the E above Dipotama, Pref. Drama, alt. 400-1400m, display behaviour at 4 places, 9.6.1987 (WEID, 1988) **[5];** Kentriki-Rodopi Reserve, Pref. Drama, alt. 1200-

1700m, display behaviour at 4 places, 6.6.1984 (WEID, 1988) **[6];** East of Livaditis, Pref. Xanthi, alt. 1200-1400m, display behaviour at 6 places, 8.6.1986 (WEID, 1988) **[7].**

Original data:

BULGARIA: Chepelare, Museum of the Rhodopean Karst, 15 ind. (2m, 1f), hibernating in the building, 22.12.2003, BP (c/o M. Barzakova) **[8]**; Dobrostan, Martziganitsa Hut, above the entrance of Ivanova voda cave, 1350m, 2 ind., social calls, detector and visual count, 10.9.2008, BP **[9]**; Dzhurkovo, around a disused mine gallery, display behaviour of several flying ind., detector and visual count, 8.10.2005, IB, TI, BP **[10]**; Madan, Pechinsko mining area, 2 flying, social calls, detector and visual count, 3.10.2008, BP, AH **[11];** Madan, in the downtown around street lamps, many flying ind., social calls, detector and visual count, 2-5.10.2008, BP, AH **[12]**.

The Western Rhodopes are part of the southern limit of the species' range in Europe (BENDA et al., 2003; HANÁK et al., 2001). The species appears to be common in the coniferous forests at higher altitudes in Greece (WEID 1988). Amongst the examined individuals found in Bulgaria, only one was a female [8]. It is not surprising that this bat is reaching the highest altitudes in the Rhodopes, i.e. 1700m and probably higher given that it was found in other high mountains of Bulgaria (BENDA et al., 2003; BP, unpublished data). Guards at the Military Base Station at the peak of Golyam Perelik (2191m, the highest summit in the Rhodopes Mts.) have reported that "bats are often found dead or alive in autumn and spring" in buildings and storage houses of the complex (oral communication to BP).

***Tadarida teniotis* (Rafinesque, 1814)**

Published data:

BULGARIA: Laki, in pellets of *Strix aluco*, 27.4.1985 (OBUCH & BENDA, 1996) **[1];** Assenovgrad, Petrol Station 1km S of the town, several flying ind., detector, 13.2-14.4 kHz, 24.3.2007, SS, DG (STOYCHEVA, 2008) **[2]**; Ravnogor, above a house in the village, alt. 1381m, detector, 10.6 kHz, 27.8.2007, SS, DG (STOYCHEVA, 2008) **[3]**.

GREECE: Galani, Pref. Xanthi, cave, 26.6.1989; idem., 15.9.1990 (HANÁK et al, 2001) **[4].**

Original data:

GREECE: Paranesti, Dist. Drama, alt. 180m, many ind. flying, visual count, 15.6.1984, VH, RW; idem., several ind. flying, visual count, 24.9.1984, RW **[5]**; Dipotama, Pref. Drama, Arkoudorrema River, alt. 450 m, 1 ind. flying, 30.8.1987, VH **[6]**; Paradisos, Pref. Kavala, cave at the militaty area, alt. 50m, many ind., visual count, 13.9.1997, Rottmann; idem, many utcropsls, visual count and detector, 7.9.2001, A. Kiefer **[7]**.

In Bulgaria, one individual was caught at the northern slopes of the Western Rhodopes Mt. The exact locality however remains unknown and thus does not allow mapping of the record. This individual is deposited as a specimen in the collection of the Museum of Natural History in Plovdiv (KALCHEV & BESHKOV, 1963). The few other records available so far, three from Bulgaria and four from Greece probably do not represent the true occurrence of this species, considering the abundance of exposed rocks and cliffs in the mountain. The highest altitude where the species was found was 1381m [3], the lowest was 50 m [7].

Discussion

Of the **30** bat species found in the study area (Fig. 4), **27** occur in Bulgarian Western Rhodopes (all except *Pipistrellus nathusii, Myotis alcathoe* and *Rhinolophus mehelyi*) and **28** species in the Greek part of the mountains (all except *Plecotus auritus* and *Myotis brandtii*). However, the presence of *P. nathusii* and *M. alcathoe* is highly likely in the Bulgarian part and respectively of *P. auritus* and *M. brandtii* in the Greek part, because of the suitability of the habitat for these species. Occurrence of *Myotis aurascens* needs further support with genetic data.

The diversity of bats in relation to the size of the area is high at both national and European levels (Fig. 3). From all species found in Bulgaria (n=33), 82% (n=27) were recorded in the Western Rhodopes, which is 7.9% of the country territory (110 843 km^2). From all species found in Greece (n=33), 85% (n=28) were recorded in the study area, which is only 1.9% of the country territory (131 944km^2 including the islands).

Bat species richness in the Greek part of the Western Rhodopes is higher (Fig. 3). However, the reported number of known summer and winter colonies, as well as the overall abundance of bats is greater in Bulgaria. Relatively poor occurrence, number and diversity of cave-dwelling species found in Greece were due to the limited number of caves and galleries, which were surveyed on a regular basis. Sixty five percent (n= 83) of the Bulgarian records come from underground roosts, while less than 16% (n=6) come from caves and galleries in Greece.

The bat fauna of the adjacent, hilly and lower Eastern Rhodopes was studied by IVANOVA & GUEORGUIEVA (2004), HANÁK et al. (2001) and partly by PAPADATOU et al. (2008, 2009). Altogether, 25 species were recorded from 86 localities (Fig. 3 and Fig. 4). *Myotis alcathoe*, *M. brandtii*, *M. nattereri*, *Vespertilio murinus* and *Plecotus auritus* have not been found in the Eastern Rhodopes. The most common species (found in >30% of the localities) in both parts of the mountains are *Rhinolophus hipposideros* and *Rh. ferrumequinum* (Fig. 4 and Fig. 5). *Myotis myotis*, *Miniopterus*

Fig. 3. Surface area, species richness, total number of bat localities and number of studied underground roosts in the Western and the Eastern Rhodopes Mountains (Bulgaria and Greece).

Western Rhodopes (present paper)					
	Area	Number of species	Number of localities	Number of caves/ galleries	Number of other roosts
BG+GR	11 220 km^2	30	164	89 (54%)	75 (46%)
Bulgaria	8 732 km^2	27	128	83 (65%)	45 (35%)
Greece	2 488 km^2	28	36	6 (17%)	30 (83%)
Eastern Rhodopes s.l. (after IVANOVA & GUEORGUIEVA (2004)*					
BG+GR	6005 km^2	25	86	51 (59%)	35 (41%)
Bulgaria	4172 km^2	21	63	39 (62%)	24 (38%)
Greece	1833 km^{2*}	21	23	12 (52%)	11 (48%)

***** the authors have included several adjacent ridges, which raise the surface with about 20%.

Fig. 4. Bat species sorted by their relative occurrence in the Western Rhodopes. **BG**- number of localities in Bulgaria. **GR-** number of localities in Greece. **WR**- number of localities for each species and its relative share from the total number of localities (N=164). **Min-Max alt.-** lowest and the highest locality, where the species was found in the Western Rhodopes. **Eastern Rhodopes-** number of localities in Bulgaria and Greece and their relative share (N=86) in the Eastern Rhodopes Mountain (data after IVANOVA & GUERGUIEVA, 2004).

SPECIES	BG	GR	TOTAL WR	Min alt.	Max. alt	Eastern Rhodopes
Rhinolophus hipposideros	69	7	76 (46,3%)	50	1635	37 (43,0%)
Rhinolophus ferrumequinum	47	7	54 (32,9%)	50	1380	47 (54,7%)
Myotis myotis	29	3	33 (18,9%)	50	1635	16 (18,6%)
Myotis blythii	24	5	29 (17,7%)	50	1610	6 (7,0%)
Myotis myotis/blythii	10	0	10 (5,5%)	850	1430	-
Miniopterus schreibersii	20	6	26 (15,9%)	50	1345	13 (15,1%)
Myotis emarginatus	17	5	22 (13,4%)	250	1610	7 (8,1%)
Myotis mystacinus s.l.	6	13	19 (11,6%)	75	1610	6 (7,0%)
Pipistrellus pipistrellus s.l.	11	7	18 (11,0%)	50	1130	15 (+4) 22,1%
Eptesicus serotinus	15	2	17 (10,4%)	70	1610	6 (7,0%)
Plecotus austriacus	15	2	17 (10,4%)	50	1381	13 (+1) 16,3%
Hypsugo savii	10	7	17 (10,4%)	50	1273	8 (9,3%)
Plecotus auritus	13	0	13 (7,9%)	730	1635	0
Nyctalus noctula	6	6	12 (7,3%)	50	1000	6 (7,0%)
Vespertilio murinus	9	3+	12 (7,3%)	400	1700	0
Nyctalus leisleri	2	8	10 (6,1%)	140	840	1 (1,2%)
Myotis nattereri	9	1	10 (6,1%)	350	1635	0
Pipistrellus pygmaeus	3	6	9 (5,5%)	140	1381	1 (1,2%)
Myotis capaccinii	8	1	9 (5,5%)	150	1380	15 (17,4%)
Rhinolophus euryale	7	2	9 (5,5%)	60	1150	15 (17,4%)
Rhinolophus blasii	5	2	7 (4,3%)	75	1150	11 (12,8%)
Tadarida teniotis	3	4	7 (4,3%)	50	1381	3 (3,5%)
Barbastella barbastellus	5	2	7 (4,3%)	370	1610	1 (1,2%)
Myotis bechsteinii	3	3	6 (3,7%)	320	1150	2 (2,3%)
Myotis alcathoe	0	6	6 (3,7%)	320	1000	0
Myotis alcathoe/mystacinus	5	0	5 (3,0%)	1100	1610	0
Myotis daubentonii	4	1	5 (3,0%)	400	1610	2 (2,3%)
Pipistrellus nathusii	0	5	5 (3,0%)	200	450	2 (2,3%)
Nyctalus lasiopterus	1	3	4 (2,4%)	140	1250	1 (1,2%)
Myotis brandtii	4 (5)	0	4 (5) 2,4%	950	1610	0
Myotis aurascens	2	1	3 (1,8%)	450	1635	1 (1,2%)
Rhinolophus mehelyi	0	1	1 (0,6%)	150	150	5 (5,8%)

schreibersii, *Eptesicus serotinus* and *Hypsugo savii* are relatively common and have similar distributional patterns all over the Rhodopes Mountains. Records of *Myotis blythii* from the Eastern Rhodopes are scarce with 7% (n=6) compared to 17,1% (n=28) found in the Western Rhodopes (Fig. 4). The limited distribution of *Rhinolophus euryale* (5,5%, n=9), *Rh. blasii* (4,3%, n=7), *Rh. mehelyi* (0,6%, n=1) and *Myotis capaccinii* (5,5%, n=9) in the Western Rhodopes supports their distinct thermophilic preferences.

While roost-surveillances and mist-nets were the most frequent methods used in the Bulgarian part of the mountain, mist-nets and detectors were the most commonly employed methods in Greece. In both countries, *Vespertilio murinus*, *Tadarida teniotis*, *Pipistrellus pipistrellus* and *P. pygmaeus* were mainly detected during acoustic surveys. Only this method was used to confirm the presence of *Tadarida teniotis* and *Pipistrellus pygmaeus* in the Bulgarian Western Rhodopes (STOYCHEVA, 2008).

In Bulgaria, research efforts were mostly focused on bats roosting and swarming at caves and galleries. Thus, only limited amount of records is available at present for the typical forest-dwelling species (e.g. *Myotis bechsteinii*, *M. nattereri*, *Barabastella*

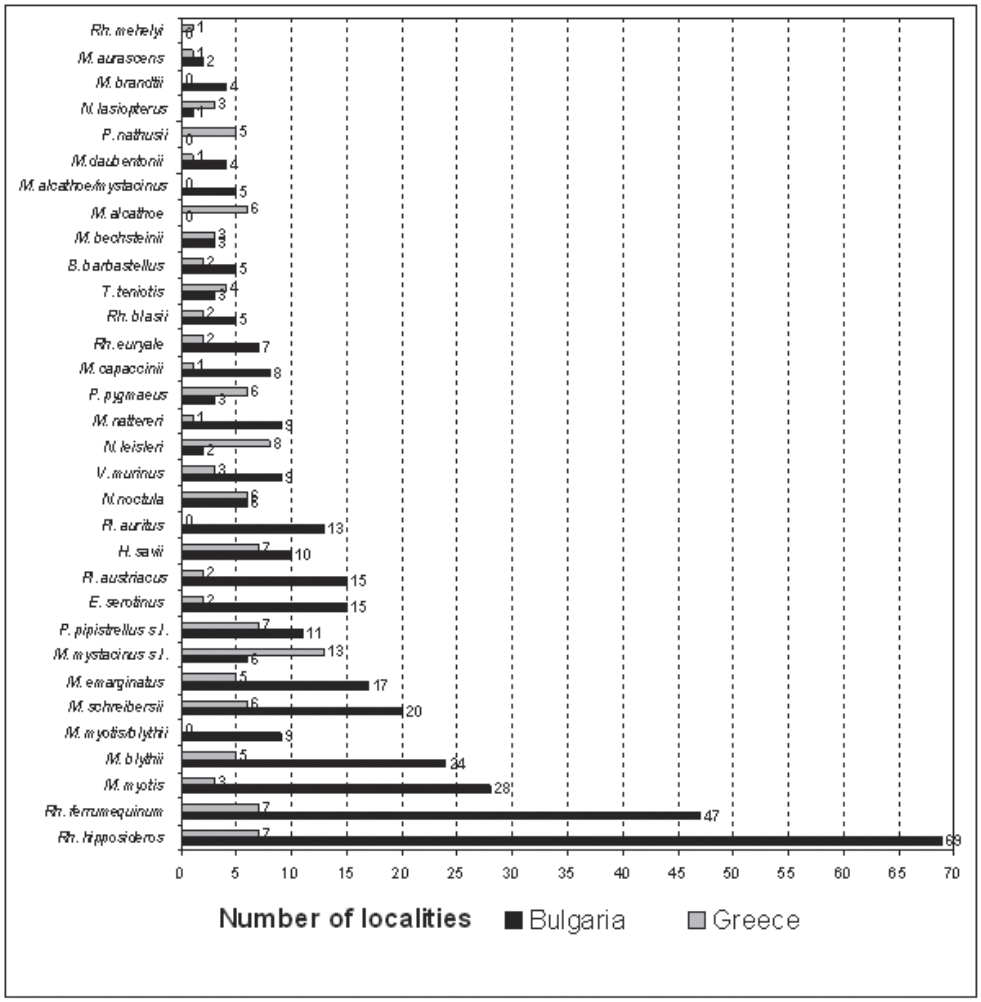

Fig. 5. Relative occurrence of bats in the Western Rhodopes Mt. (Bulgaria and Greece).

barbastellus, *Nyctalus lasiopterus* and others). Considering that 70% of the mountain's surface in Bulgaria is covered with deciduous and mixed forests (ALEXANDROV & DELKOV, 2006), our data presumably underestimates the actual distribution of the forest-dwelling bats. Further research should focus on bats in forests of all types and altitude. Another habitat that has not been studied is the subalpine zone (>1800m, ca. 3% of the study area) including the upper tree line zone. In general, we believe that diversification and simultaneous sampling with different research methods will enrich our knowledge for the roosts and habitats used by the different species.

Bat migrations and roost switching

Data on the migratory seasonal movements and roost switching by bats in the Western Rhodopes are scarce (Fig. 6, Appendix 3). Noteworthy migrations of *Myotis capaccinii* were proved from Koufovouno Cave (breeding colonies, Greece) to Ivanova Voda cave (hibernating colonies, Bulgaria; distance: 144 km) and between Cave of Cyclops at Maronia (breeding colonies, Greece) to Gargina Dupka cave (hibernating colonies, Bulgaria; distance 113 km) (PAPADATOU et al., 2009). In general, we have found that some species (e.g. *Myotis myotis*, *M. blythii*, *M. capaccinii*) start to gather at their hibernation sites in the Western Rhodopes in late August and in September. At that time, we have observed copulation of *Miniopterus schreibersii* and *Myotis capaccinii* (Gargina Dupka Cave). After spending the winter in Ivanova Voda Cave, around the middle of April, part of *M. myotis/blythii* colony presumably migrates towards their Eastern Rhodopean nurseries (e.g. Yarasa Ini Cave, Aina Ini Cave). Part of the colony (ca.

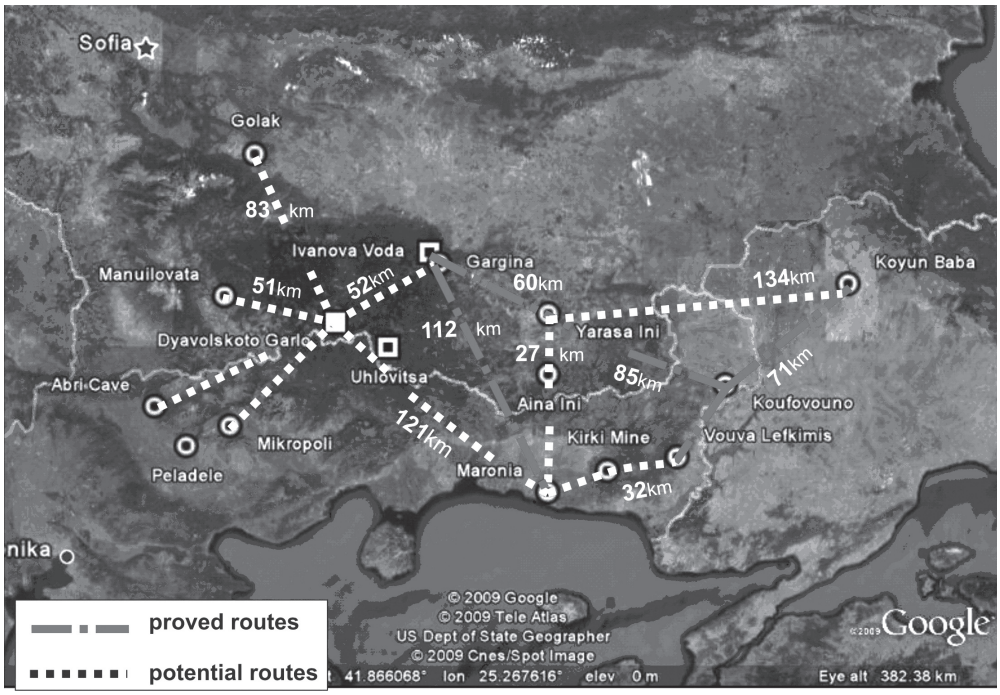

Fig. 6. Map of known migration/dispersal routes of *Myotis capaccinii* and potential routes of *Miniopterus schreibersii* and *Myotis myotis/blythii*.

500-1000 ind.) however remains and breeds at higher altitudes (ca. 1000-1300m) in caves of the same region.

In Dyavolskoto Garlo Cave, an increasing number of *Miniopterus schreibersii* was reported in September and October with a winter maximum in January-February (K. Hadzhiiski, pers. communication). Our data indicate that large number of bats use these important caves for at least seven months (September to March) for wintering, pre- and post-hibernation foraging and copulation.

Only one transient bat roost was discovered in Bulgaria (Pavla Cave). It is used for short periods (2-7 days) in March-April and in August-September by small groups/colonies of *Miniopterus shreibersii* (200-500 ind.) most probably on their way to Golak Mine for breeding and back to Dyavolskoto Garlo Cave for hibernation (Fig. 6 and Fig. 2). Yarasa Ini Cave in the Eastern Rhodopes is another potential stop-over roost for at least part of the hibernating colonies of *Myotis capaccinii* and *Myotis myotis/blythii* (Ivanova Voda Cave) and *Miniopterus schreibersii* (Dyavolskoto Garlo Cave) on their way to their Greek breeding sites (e.g. Koufovouno, Tsoutouro Mine, Kirki Mine, Cave of Cyclops and other) (IVANOVA & GUEORGUIEVA, 2004; PAPADATOU, 2008).

Species richness of bats at local level

Present knowledge for the richness of local bat faunas is primary related to the number of researcher's visits. Greater sampling effort resulted in an increase of the species detection. Only single or occasional reports are avaible for more than 80% of the known bat roosts and sites. Thus, field data from many of the rarely surveyed areas are poor and considering the great habitat heterogeneity and roost availability more species are expected to be found in the future. At present, we can point out four areas in Bulgaria and three in Greece (Fig. 7 and Fig. 8), where 10 to 19 species of bats were found.

Conservation of bats in the Western Rhodopes Mt.

There are more than 600 natural caves in the Bulgarian Western Rhodopes and about 120 of them have been biospeleologically studied in the last 60 years (PETROV & STOEV, 2007). Here we report bats from 71 caves (ca. 12%) and 12 disused mine galleries. Legally protected under the Protected Areas Act (1998) are 8 caves declared as Natural Landmarks and about 60 fall within borders of Protected Areas. Several hundred caves fall within borders of the NATURA 2000 sites "Rhodopi Zapadni –BG0001030" and "Rhodopi Sredni – BG0001031". However, no special measures, plans or projects have been implemented to protect the cave fauna including bats. A Management Plan was recently enforced only for Dyavolskoto Garlo Cave (as part of a larger protected area), which introduces certain restrictions for the tourist visits between 1st December and 30th March with regards to the protection of the hibernating bat colony.

The importance of the large bat caves in Bulgaria was provisionally assessed by BESHKOV (1993) and recently by IVANOVA (2005) after the EUROBATS/UNEP recommendations for the management of the underground roosts (http://www.eurobats.org). Two bat caves in the Western Rhodopes are listed as having international importance, one has national and two have been accessed of having regional importance (Fig. 9).

In Greece, the greatest part of the Paranesti Virgin Forest (550 ha) is strictly protected. Kompsatos Valley (Koilada Komsatou) near Komotini (Prefecture of Rodopi) was declared as a Specially Protected Area. The Nestos Defile has also been declared

Fig. 7. Hot-spots of bat species richness in the Western Rhodopes Mt. (Bulgaria and Greece).

Site	Species	Physical Features
BULGARIAN WESTERN RHODOPES		
Trigrad-Yagodina **19 species**	*Miniopterus schreibersii*, *Myotis capaccinii*, *M. emarginatus*, *M. myotis*, *M. blythii*, *M. nattereri*, *M. bechsteinii, M. daubentonii*, *M. brandtii*, *M. mystacinus s.l.*, *Rhinolophus ferrumequinum*, *Rh. hipposideros*, *Eptesicus serotinus*, *Hypsugo savii*, *Nyctalus leisleri*, *N. lasiopterus*, *Pipistrellus pipistrellus*, *Plecotus austriacus*, *Vespertilio murinus*	Kartic relief including deep gorges of Trigrad and Buinovo, exposed rocky habitats, forests of *Picea abies*, *Pinus sylvestris*, *P. peuce*, *Fagus sylvatica*. More than 120 caves. Protected Areas "Trigrad Gorge" and "Buynovsko Gorge". Altitude: 900-1400m.
Peshtera **13 species**	*Rhinolophus ferrumequinum*, *Rh. hipposideros*, *Rh. blasii*, *Rh. euryale*, *Myotis myotis*, *M. blythii*, *M. emarginatus*, *M. capaccinii*, *Miniopterus schreibersii*, *Eptesicus serotinus*, *Nyctalus noctula*, *Plecotus auritus*, *Barbastella barbastellus*	A river valley with decidous forests of *Fagus sylvatica*, *Fraxinus excelsior*, *Acer* spp., *Carpinus* spp., rarely mixed with *Pinus sylvestris*. 31 caves are known. Managed Reserve "Kupena". Altitude: 500-1000m.
Gorna Arda **12 species**	*Rhinolophus ferrumequinum*, *Rh. hipposideros*, *Rh. blasii*, *Myotis myotis*, *M. blythii*, *M. emarginatus*, *Miniopterus schreibersii*, *Eptesicus serotinus*, *Plecotus austriacus*, *Pipistrellus pipistrellus*, *Nyctalus leisleri*, *Vespertilio murinus*	The upper part of Arda River valley. Many small side valleys, mixed forests of *Fagus sylvatica*, *Pinus sylvestris*, *P. nigra*, green pastures, cattle breeding. Altitude: 750-1200m.
Dobrostan 10 species	*Myotis myotis*, *M. blythii*, *M. capaccinii*, *M. emarginatus*, *M. cf. brandtii*, *Miniopterus schreibersii*, *Rhinolophus ferrumequinum*, *Rh. hipposideros*, *Vespertilio murinus*, *Pipistrellus pipistrellus*	A karstic plateau with exposed rocky habitats, forests of *Pinus nigra*, *Abies alba*, *Fagus sylvatica*, grasslands and pastures with *Festuca* spp., *Chrysopogon*, *Agrostis*, *Juniperus oxycedrus*. Cattle breeding. More than 140 caves. Biosphere Reserve "Chervenata Stena". Altitude: 1000-1500m.

Fig. 7. Continued.

Site	Species	Physical Features
GREEK WESTERN RHODOPES		
Forests in Kompsatos valley between Medousa and Kotani 12 species	*Myotis alcathoe*, *M. bechsteinii*, *M. emarginatus*, *M. mystacinus*, *Nyctalus lasiopterus*, *Nyctalus leisleri*, *Nyctalus noctula*, *Hypsugo savii*, *Miniopterus schreibersii*, *Pipistrellus pipistrellus*, *P. pygmaeus*, *Rhinolophus hipposideros*	A valley with *Platanus* trees along the river. Beech forests in higher altitudes, oak forests in lower altitudes. Rocky habitats, small volcanic outcrops and caves. Altitude: 280-500m.
Arkoudorrema River near Dipotama 12 species	*Barbastella barbastellus*, *Myotis alcathoe*, *M. daubentonii*, *Myotis emarginatus*, *M. mystacinus*, *M. nattereri*, *N. leisleri*, *Pipistrellus nathusii, P. pipistrellus*, *P. pygmaeus*, *Rhinolophus hipposideros*, *Tadarida teniotis*	A river valley with *Platanus*, *Quercus* spp., *Alnus* spp. and shrubs (*Carpinus orientalis*, *Juniperus* spp.). The slopes and hills in higher altitudes are covered by montane beech forests. Altitude: 300-900m.
Toxotes-Galani 12 species	*Rhinolophus ferrumequinum*, *Rh. euryale*, *Rh. hipposideros*, *Eptesicus serotinus*, *Myotis myotis*, *M. blythii*, *Miniopterus schreibersii*, *Hypsugo savii*, *Nyctalus noctula*, *Pipistrellus pipistrellus*, *Plecotus austriacus, Tadarida teniotis*	Karstic hills with bushy vegetation and *Platanus* stripes near the bank of Nestos River. Small caves, limestone outcrops. Altitude: 50-500m.

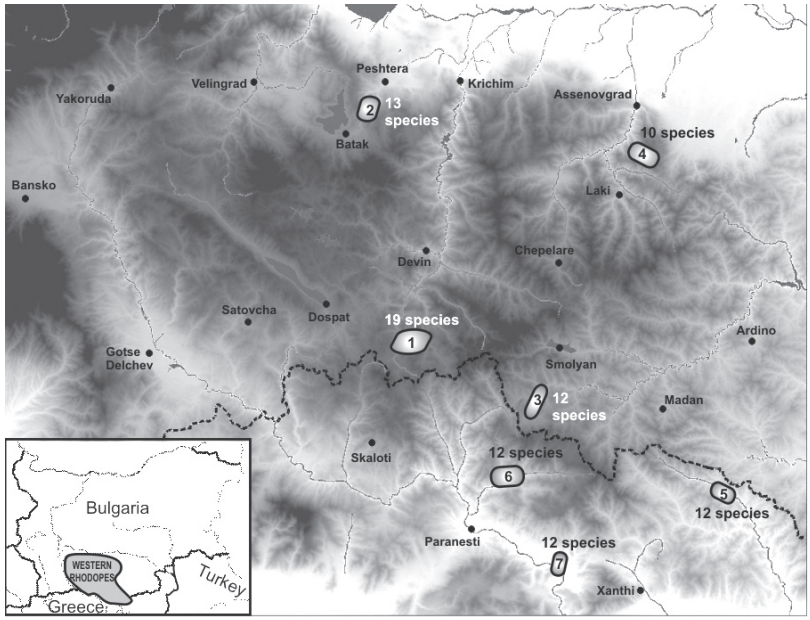

Fig. 8. Map of the hot-spots of bat species richness in the Western Rhodopes. **1-** Trigrad-Yagodina; **2-** Peshtera; **3-** Gorna Arda; **4-** Dobrostan; **5-** Kompsatos River; **6-** Arkoudorrema River; **7-** Toxotes-Galani.

as a Specially Protected Area and an Aesthetic Forest. NATURA 2000 network also includes sites as "Oros Chaidou-Koula & Gyro Koryfes-GR1120003", "Periochi Elatia –GR1140003" and "Partheno Dasos Kentrikis Rodopis – GR1140007". However, bats are only formally mentioned in the species lists for some of these sites and no special regulations directly concern protection of their roosts and habitats.

In our view, effective conservation of any cave-dwelling bat species requires site-by-site protection of its winter, summer and transient roosts. Depending on the season, many bats use roosts and foraging habitats in different regions, which are quite often even across the national borders (cf. DIETZ et al. 2009a; PAPADATOU et al., 2008; PAPADATOU et al., 2009).

Thus, management of bats as protected species must involve coordinated enforcement of national and international legislation. The Rhodopes Mountains is a good example of a region located between three countries, namely Bulgaria, Greece and Turkey. These are all rich in biodiversity, but have different traditions, conservation approaches and national nature protection legislation.

In Bulgaria, which is a member of the EUROBATS Agreement, all 33 species are strictly protected by the Biodiversity Act (2002). Since many years, local bat enthusiasts actively propose important bat sites for legal protection, report violations and carry out regular *in-situ* monitoring. As a result, bats have generally received a key importance for the success of every local management plan and regional project proposals.

In Greece, law protects all wild animal species, but natural caves are under the jurisdiction of the Archaeological Service of the Ministry of Culture. The weak public awareness and limited expert capacity at a regional scale (a note valid for Turkey as well)

Fig. 9. List of caves known as "Important Bat Underground Habitats" in the Bulgarian Western Rhodopes Mt. after IVANOVA (2005) and new data.

CAVE	STATUS	SPECIES	IMPORTANCE
Dyavolskoto Garlo, Trigrad **4 species** 548 m / -102 m	Show-cave Protected territory	*Miniopterus schreibersii* *Myotis capaccinii* *Rhinolophus ferrumequinum* *Rh. hipposideros*	**International.** The second largest hibernaculum of *Miniopterus schreibersii* in Bulgaria (up to 40 800 individuals). In summer, several thousand non-reproductive *M. schreibersii.*
Ivanova Voda, Dobrostan **8 species** 695 m / -113 m	Protected territory	*Myotis myotis* *M. blythii* *M. capaccinii* *M. emarginatus* *M.* cf. *brandtii* *Miniopterus schreibersii* *Rhinolophus ferrumequinum* *Rh. hipposideros*	**International.** Large hibernation colony of *Myotis myotis/blythii* (up to 6 500 ind.) and *M. capaccinii* (up to 9 000 ind.). In summer, alternative roost for a mixed breeding colony of *Myotis myotis/blythii.*
Gargina Dupka, Mostovo **6 species** 524 m / + 38 m	Natural Landmark	*Myotis capaccinii* *Miniopterus schreibersii* *Myotis myotis* *M. blythii* *Rhinolophus ferrumequinum* *Rh. hipposideros*	**National.** Big hibernation and breeding colonies of up to several thousand *Miniopterus schreibersii* and *Myotis capaccinii.*

Fig. 9. Continued.

CAVE	STATUS	SPECIES	IMPORTANCE
Manuilovata Peshtera, Ribnovo **10 species** 2119 m / -115	No protection	*Miniopterus schreibersii* *Rhinolophus ferrumequinum* *Rh. euryale* *Rh. blasii* *Rh. hipposideros* *M. myotis* *M. bechsteinii* *M. emarginatus* *Barbastella barbastellus* *Eptesicus serotinus*	**Regional.** Hibernaculum for several thousands *Miniopterus schreibersii*, potential migratory stop over roost, important swarming site.
Uhlovitsa, Mogilitsa **8 species** 330 m / -25 m	Show-cave, Natural Landmark	*Rhinolophus ferrumequinum* *Rh. hipposideros* *Rh. blasii* *Myotis myotis* *Myotis emarginatus* *Eptesicus serotinus* *Plecotus austriacus* *Pipistrellus pipistrellus*	**Regional.** Several dozens hibernating bats of 8 species, important swarming site

turn the legal protection of many important bat roosts rather problematic procedure (e.g. Koufovouno Cave and Kirki Mine in Evros Prefecture GR; Koyun Baba Cave in Trakya Region, TR).

Further regional bat collaborations and accumulation of consistent research data will allow wider conservation coverage of important roosts and habitats. However, enhancement of the local expert capacity and training of new helpers remain the most important task to achieve effective and long-term protection of bats in the region.

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References

ALEXANDROV A., A. DELKOV. 2006. Dendrological diversity in the Western Rhodopes (Bulgaria).- In: Beron P. (ed) Biodiversity of Bulgaria. 3. Biodiversity of Western Rhodopes (Bulgaria and Greece) I. Pensoft & Nat. Mus. Natur. Hist., Sofia, 195-203.

ATANASOV N. 1936. Novata Peshtera cave near the town of Peshtera.- Priroda i Nauka, Sofia, **3** (5-6): 75-77 (in Bulgarian).

BACHVAROV G. 1963. Contribution à l'étude de la faune des helminthes chez les chauve-souris en Bulgarie. – Trud. Visʌ. Pedag. Inst., Plovdiv, Biol. **1**(1): 99-101 (in Bulgarian, Russian and French summary).

BENDA P., I. HORÁČEK. 1995. Geographic variation in three species of *Myotis* (Mammalia, Chiroptera) in South of the Western Palearctics. – Acta Soc. Zool. Bohem., **59**: 17-39.

BENDA P., K. A. TSYTSULINA. 2000. Taxonomic revision of *Myotis mystacinus* group (Mammalia: Chiroptera) in the western Palearctic.- Acta Soc. Zool. Bohem., **64**: 331-398.

BENDA P., T. IVANOVA. 2003. Long-eared bats, genus *Plecotus* (Mammalia: Chiroptera), in Bulgaria: a revision of systematic and distributional status.- Čas. Nár. Muz., Ř. Přírodověd., **172**: 157-172.

BENDA P., T. IVANOVA, I. HORÁČEK, VL. HANÁK, J. ČERVENÝ, J. GAISLER, A. GUÉORGUIEVA, B. PETROV, VL. VOHRALÍK. 2003. Bats (Mammalia: Chiroptera) of the Eastern Mediterranean. Part 3. Review of bat distribution in Bulgaria.- Acta Soc. Zool. Bohem., **67**: 245-357.

BERON P. 1961. Contribution à la connaissance des chauves-souris bulgares.- Fragmenta Balcanica. Mus. Maced. Sci. Natur., **3**(24): 189-195.

BERON P. 1963. Le baguage des chauves-souris en Bulgarie de 1940 à 1961. – Acta Theriologica, **7**: 33-49.

BERON P. 1964. Über das Vorhandensein von zwei Arten langohrigen Fledermäuse (Gattung *Plecotus*) in Bulgarien.- Bull. Inst. Zool. Mus., Sofia, **16**: 29-34 (in Bulgarian, German and Russian summary).

BERON P. 1968. Notes sur quelques acariens des fam. Myobiidae, Spinturnicidae et Macronyssidae, parasites des chauves-souris en Bulgarie. – Bull. Inst. Zool. Mus., Sofia, **27**: 157-161 (in Bulgarian, Russian and French summary).

BERON P. 1972. Essai sur le faune cavernicole de Bulgarie III. Résultats des recherches biospéologiques de 1966 à 1970. – Int. J. Speleol., **4**: 285-349.

BERON P. 1973a. Catalogue des acariens parasites et commensaux des mammifères en Bulgarie.- Bull. Inst. Zool. Mus., Sofia, **37**: 167-199.

BERON P. 1973b. Catalogue des acariens parasites et commensaux des mammifères en Bulgarie II.- Bull. Inst. Zool. Mus., Sofia, **38**: 105-136.

BERON P. 1974. Données nouvelles sur les acariens parasites des mammifères en Bulgarie, en Yougoslavie en Turquie et aux îles de Corse et de Crète. – Bull. Inst. Zool. Mus., Sofia, **40**: 59-69.

BERON P. 1994. Resultats des recherches biospéléologiques en Bulgarie de 1971 à 1994 et liste des animaux cavernicoles bulgares.- Serie Tranteeva, Bulgarian Federation of Speleology, Sofia, 1, 137 p.

BERON P., M. KOLEBINOVA. 1964. Mites of the family Spinturnicidae from Bulgaria and Rumania.- Bull. Inst. Zool. Mus., Sofia, **15**: 231-238 (in Bulgarian, Russian and English summary).

BERON P., V. GUÉORGUIEV. 1967. Essai sur le faune cavernicole de Bulgarie II. Résultats des recherches biospéloléogiques de 1961 à 1965. – Bull. Inst. Zool. Mus., Sofia, **24**: 151-212.

BESHKOV V. 1993. Bats. Pp.: 631-644. In: SAKALJAN M. & MAJNI K. (eds.) Programme of Biodiversity Conservation. National Strategy of Protection of Biodiversity. Basic Studies. Volume 1. Sofia & Washington: NBDCS & BSP, 664 pp (in Bulgarian).

BESHKOV V. 1998. The Bats of Bulgaria. Pp.: 453-466. In: MEINE C. (ed.): Bulgaria's Biological Diversity: Conservation Status and Needs Assessment. Vol. I. And II. Washington: Biodiversity Support Program, 839 pp.

BESHKOV V., P. BERON. 1962. Notizen über die Verbreitung und die Biologie einiger seltener Fledermäuse in Bulgarien. – Bull. Inst. Zool. Mus., Sofia, **12**: 35–39 (in Bulgarian, German and Russian summary).

BESHKOV V., B. PETROV. 2001. Research on bats in the designated protected territory "Dobralak-Prespa" (Western Rhodopes). – unpublished report, Wilderness Fund Sofia, 8 p. (in Bulgarian).

DIETZ CH., O. VON HELVERSEN. 2004. Illustrated identification key to the bats of Europe. – Electronic Publication, 35 p.

DIETZ CH., I. DIETZ, T. IVANOVA, B. SIEMERS. 2009a. Seasonal and regional scale movements of horseshoe bats (*Rhinolophus*, Chiroptera: Rhinolophidae) in northern Bulgaria.- Nyctalus (N.F.), Belrin, **14** (1/2): 52-64.

DIETZ CH., O. VON HELVERSEN, D. NILL. 2009b. Bats of Britain, Europe and Northwest Africa. – A&C Black, 400 p.

DRENSKI P. 1955. Artbestand und Verbreitung der Zecken (Ixodoidea) in Bulgarien (im Hinblick auf ihre medizinische und tierärtztliche Bedeutung). – Bull. Inst. Zool. Mus., Sofia, **4-5**: 109-168 (in Bulgarian, Russian and German summary)

GARIN I., J. AIHARTZA, P. T. AGIRRE-MENDI, J. T. ALCALDE, J. DE LUCAS, O. DE PAZ, U. GOITI, A. ARTAACUTEZCOZ. 2008. Seasonal movements of the Schreibers' bat, *Miniopterus schreibersii*, in the northern Iberian Peninsula.- Italian Journal of Zoology, **75** (3): 263-270.

GUÉORGUIEV V., P. BERON. 1962. Essai sur le faune cavernicole de Bulgarie. – Ann. Spéléol., **17**: 285-441.

HANÁK V., M. JOSIFOV. 1959. Zur Verbreitung der Fledermäuse Bulgariens. – Säugetierk. Mitt., **7**: 145-151.

HANÁK V., P. BENDA, M. RUEDI, I. HORÁČEK, T.S. SOFIANIDOU. 2001. Bats (Mammalia: Chiroptera) of the Eastern Mediterranean. Part 2. New records and review of distribution of bats in Greece. – Acta Soc. Zool. Bohem., **65**: 279-346.

HAZELTON M. 1970. Fauna from some caves in Bulgaria and one in Yugoslavia. – Trans. Cave Res. Group Great Brit. (Ledbury), **12**: 33-37.

HORÁČEK I., J. ČERVENÝ, A. TAUŠL, D. VÍTEK. 1974. Notes on the mammal fauna of Bulgaria (Insectivora, Chiroptera, Rodentia). – Věst. Čs. Společ. Zool., **38**: 19-31.

HORÁČEK I., J. ČERVENÝ, A. TAUŠL. D. VÍTEK. 1971. Contribution to investigation of small mammals of Rhodopes Mts. – Rodopski Peshternyak, Chepelare, **7**(54): 40-44 (in Bulgarian).

HUTTERER R., T. IVANOVA, CH. MEYER-CORDS, L. RODRIGUES. 2005. Bat migrations in Europe: a review of banding data and literature. – Bundesamt für Naturschutz, **28**, 180 p.

HŮRKA K. 1984. Notes on the taxonomy and distribution of Ischnopsyllidae (Siphonaptera), with description of a new species from Vietnam. – Acta Entomol. Bohemoslov., **81**: 204-211.

IVANOVA T. 2005. Important bat underground habitats (IBUH) in Bulgaria.- Acta Zoologica Bulgarica, Sofia, **57** (2): 197-206.

IVANOVA T., A. GUEORGUIEVA. 2004. Bats (Mammalia: Chiroptera) of the Eastern Rhodopes (Bulgaria and Greece) – species diversity, zoogeography and faunal patterns. – In: Beron P., A. Popov (eds). Biodiversity of Bulgaria. 2. Biodiversity of Eastern Rhodopes (Bulgaria and Greece). Pensoft & Nat. Mus. Natur. Hist., Sofia, 907-927.

KALCHEV B., V. BESHKOV. 1963. Die Bulldogfledermaus – Vertreter einer neuer Fledermaus-Familie in Bulgarien. – Bull. Inst. Zool. Mus., Sofia, **14**: 251-253 (in Bulgarian, German and Russian summary).

KOCK D. 1974. Pupipare Dipteren von Säugetieren des nordöstlischen Mittelmeerraumes (Ins.: Diptera).- Senckenbergiana Biol., **55**: 87-104.

KOLEBINOVA M. 1968. *Neotrombicula* (*Neotrombicula*) *rhinolophi* – a new species parasitic on bats in Bulgaria (Acarina: Trombiculidae).- Compt. Rend. Acad. Bulg. Sci., **24**: 383-386.

LINDBERG K. 1955. Notes sur les grottes da la Gréce.- Acta Mus. Maced. Sci. Natur. Skopje, **3**: 41-69.

LUČAN R. K, M. ANDREAS, P. BENDA, T. BARTONIČKA, T. BŘEZINOVÁ, A. HOFFMANNOVÁ, ŠT. HULOVÁ, P. HULVA, J. NECKÁŘOVÁ, A. REITER, T. SVAČINA, M. ŠÁLEK, I. HORÁČEK. 2009. Alcathoe Bat (*Myotis alcathoe*) in the Czech Republic: Distributional Status, Roosting and Feeding Ecology. – Acta Chiropterologica, **11**(1):61-69.

MARKOV G., N. DZHAMBAZOV. 1962. The Snezhanka cave.- Priroda i Znanie, Sofia, **15**(2): 17-20 (in Bulgarian).

MAYER F., CH. DIETZ, A. KIEFER. 2007. Molecular species identification boosts bat diversity.- Frontiers in Zoology, **4**: 4 doi:10.1186/1742-9994-4-4.

NIERMANN, N., M. BIEDERMANN, W. BOGDANOWICZ, R. BRINKMANN, Y. LE BRIS, M. CIECHANOWSKI, C. DIETZ, I. DIETZ, P. ESTOK, O. VON HELVERSEN, A. LE HOUEDEC, S. PAKSUZ, B. P. PETROV, B. OZKAN, K. PIKSA, A. RACHWALD, S. Y. ROUE, K. SACHANOWICZ, W. SCHORCHT, A. TERESA, F. MAYER. 2007. Biogeography of the recently described *Myotis alcathoe* von Helversen and Heller, 2001. – Acta Chiropterologica, **9**: 361-378.

NOWOSAD A., G. BATCHVAROV, P. PETROV. 1987. Bat flies (Nycteribiidae, Diptera) of bats collected in Bulgaria. – Pol. Pismo Entomol., **57**: 673-694.

OBUCH J., P. BENDA. 1996. Contribution to the feeding ecology of *Strix aluco* and *Bubo bubo* (Aves: Strigiformes) in southwestern Bulgaria. – Acta Soc. Zool. Bohem., **60:** 43-49.

PANDURSKA R., V. BESHKOV. 1998. Bats (Chiroptera) of high mountains of Southern Bulgaria. Pp.: 135–140. In: CARBONNEL J.-P. & STAMENOV I. N. (eds.): Observatoire de montagne de Moussala. Symposium international, Octobre 1997, Borovets, Sofia.

PANDURSKA R., T. IVANOVA. 2003. Distribution and present status of *Barbastella barbastellus* (Schreber, 1774) in Bulgaria.- Nyctalus (N.F.), Belrin, 8 (6): 626-629.

PANDOURSKI I., V. POPOV 2009. Monitoring study on bats (Mammalia, Chiroptera) in Eastern Rhodopes, Bulgaria.- In: Conference "Exploration and protection of karst and caves", 50th years Student Speleological Club "Akademic"- Sofia, 24.10.2008, 148-156. (in Bulgarian, English summary).

PAPADATOU E., R. K. BUTLIN, J. D. ALTRINGHAM. 2008. Seasonal roosting habits and population structure of the Long-fingered Bat *Myotis capaccinii* in Greece. – Journal of Mammalogy, **89** (2): 503-512.

PAPADATOU E., R. K. BUTLIN, R. PRADELC, J. D. ALTRINGHAM. 2009. Sex-specific roost movements and population dynamics of the vulnerable long-fingered bat, *Myotis capaccinii*. – Biological Conservation, **142**: 280-289.

PAUNOVIĆ M., B. KARAPANDZHA. 1999. Bat fauna of Valjevo area (Western Serbia).- In: Cruz, M. & Kozakiewicz (Eds.). Bats & Man. Million Years of Coexistence. Abstracts VIIIh European Bat Research Symposium, 23-27 August 1999, Poland: 47-48.

PETROV B. 2002. Bats (Mammalia: Chiroptera) in the Western Rhodopes Mt.- review of the species composition, distribution and conservation status.- unpublished report, project "Assessment of

Existing Information on Biodiversity in the Western Rhodopes", UNDP, Wilderness Fund, Sofia, 14 p.

PETROV B. 2006. Distribution and status of *Myotis bechsteinii* in Bulgaria (Chiroptera: Vespertilionidae).- Lynx n.s., Praha, **37**: 179-195.

PETROV B. 2009a. Survey on breeding colonies of cave-dwelling bats in the Rhodope Region. – unpublished project report, UNDP Rhodope Project, National Museum of Natural History, Sofia, 16 pp., 2 Annexes. (in Bulgarian, English summary).

PETROV B. 2009b. Research on Bats (Mammalia: Chiroptera) in Madan municipality (September 2008-January 2009).- unpublished project report, Association of Parks in Bulgaria, Sofia, 16 p. (in Bulgarian).

PETROV B., P. STOEV, T. IVANOVA. 2005. Research of caves and bats in three karst regions in the Western Rhodopes Mt. – unpublished project report, UNDP Rhodope Project, National Museum of Natural History, Sofia, 25 pp., 6 Annexes.

PETROV B., P. STOEV. 2006. Research of caves and bats in four karst regions in the Western and Eastern Rhodopes Mt. – unpublished project report, UNDP Rhodope Project, National Museum of Natural History, Sofia, 20 pp., 13 Annexes.

PETROV B., P. STOEV. 2007. The underground world of the mountain Rhodopes.- UNDP Rodope project, 86 pp. (in Bulgarian, English summary).

POPOV V., T. IVANOVA. 2002. Comparative craniometrical analysis and distributional patterns of mediumsized horseshoe bats (Chiroptera: Rhinolophidae) in Bulgaria. – Folia Zool., **51**: 187-200.

SKURATOWICZ W. 1970. Nycteribiidae (Diptera, Pupipara) in the collection of the Institute of Zoology of Polish Academy of Science. – Pol. Pismo Entomol., **40**: 745-748 (in Polish, English summary).

SKURATOWICZ W., K. BARTKOWSKA, G. BATCHVAROV. 1982. Fleas (Siphonaptera) of small mammals and birds collected in Bulgaria. – Fragm. Faun., **27**: 101-140.

SPITZENBERGER F. 1996. Distribution and subspecific variation of *Myotis blythii* and *Myotis myotis* in Turkey (Mamm., Vespertilionidae).- Ann. Naturhistor. Mus. Wien, **98b**, Suppl.: 9-23.

STEFANOV P. 2006. Physical-Geographical Characteristics of the Western Rhodopes (Bulgaria and Greece). – In: P. Beron (ed.). Biodiversity of Bulgaria, 3. Biodiversity of Western Rhodopes (Bulgaria and Greece). Pensoft & Nat. Mus. Natur. Hist., Sofia**,** 15-79.

STOYCHEVA S. 2008. Research on the fauna and ecology of bats (Chiroptera) in the region of Plovdiv and Stara Zagora. – unpublished M.Sci thesis, University of Plovdiv, Faculty of Biology, Department of Ecology and Environmental Protection, 90 p. (in Bulgarian).

STRELKOV P. 2000. Seasonal distribution of migratory bat species (Chiroptera, Vespertilionidae) in eastern Europe and adjacent territories: nursing area.- Myotis, Bonn, **37**: 7-25.

TILOVA E., S. STOYCHEVA, D. GEORGIEV. 2005. New information on the distribution of some bat species (Mammalia: Chiroptera) from Bulgaria. – Scientific Studies- Biology, Animalia, University of Plovdiv, **41**: 135-144.

THOMAS D.W., R.K. LAVAL. 1988. Survey and census methods.- In: Kunz TH (ed.) Ecological and behavioral methods for the study of bats, Smithsonian Institution Press, Washington, DC, 77-89 p.

VOLLETH M. 1987. Differences in the location of nucleolus organizer regions in European vespertilionid bats.- Cytogenet. Cell Genet., **44**: 186-197.

VON HELVERSEN O., R. WEID. 1990. Die Verbreitung einiger Fledermausarten in Griechenland.- Bonner Zoologische Beiträge, **41** (1): 9-22.

VON HELVERSEN, O., K-G. HELLER, F. MAYER, A. NEMETH, M. VOLLETH, P. GOMBKÖTÖ. 2001. Cryptic mammalian species: a new species of whiskered bat (*Myotis alcathoe* n. sp.) in Europe. – Naturwissenschaften, **88**: 217-223.

WEID R. 1988. Occurrence of the particoloured bat *Vespertilio murinus* (Linne, 1758) in Greece and some observations on its display behaviour. – Myotis, Bonn, **26**: 117-128.

YANCHEV Y., R. STOYKOVA. 1973. Study of the helminthofauna of the bats (Chiroptera) in Bulgaria. – Bull. Inst. Zool. Mus., Sofia, **37**: 113-146 (in Bulgarian, English summary).

Appendix 1. Underground localities of bats in the Western Rhodopes Mt.

Village or Town	Locality	Alt. (m)
Bulgaria		
1. Assenovgrad	karstic niche above the town	500
2. Bachkovo	small cave	600
3. Belitsa	Shepran Dupka cave	880
4. Belitsa	the natural bridge below the village	645
5. Boevo	Boevskata Peshtera cave	1065
6. Borikovo	Borikovskata Peshtera cave	1105
7. Borino	Eminova dupka cave	1130
8. Breze	Byaloto Kamene cave	1230
9. Byal Izvor	Ddzhin Gugu cave	655
10. Chepelare	Samurski Dupki cave	1300
11. Doborstan	Topchika cave	990
12. Dobrostan	Ahmetyova Dupka cave	1380
13. Dobrostan	Ivanova Voda cave	1325
14. Dobrostan	Lednitsata cave	1345
15. Dobrostan	Ovchata Peshtera cave	1150
16. Dobrostan	Pirkovskata Peshtera cave	1185
17. Dolno Vlahovo	Potoka cave	1150
18. Dryanovo	Barzibogovata Peshtera cave	1110
19. Dryanovo	Leshtaka cave	1140
20. Dryanovo	Mogila cave	1200
21. Dzhurkovo	disused mine gallery	1240
22. Gela	Lednitsata cave	1610
23. Gela	small cave near the village	1450
24. Gospodintsi	Bekir Salievata Peshtera cave	595
25. Gospodintsi	Zlatarskata Peshtera cave	670
26. Grohotno	disused mine gallery	1000
27. Hvoyna	newly found cave, about 2 km NW	1000
28. Kesten	Forgovo I cave	1350
29. Kobilyane	Vodnata Peshtera cave	580
30. Koshnitsa	Goloboitsa cave	850
31. Kremene	Kremenskata Peshtera cave	1115
32. Kremene	Tamnitsata cave	1200
33. Laki	disused mine gallery	660
34. Madan	Sharenka cave	835
35. Madan	disused mine gallery near Sharenka trailhead	792
36. Madan	Pechinsko, disused storage gallery	870
37. Mihalkovo	disused mine gallery	585
38. Mogilitsa	Byala Voda cave	1050

Appendix 1. Continued.

Village or Town	Locality	Alt. (m)
39. Mogilitsa	Uhlovitsa cave	1040
40. Mostovo	Borovskata Vodna Peshtera cave	750
41. Mostovo	Gargina Dupka cave	905
42. Mugla	Drangaleshkata Propast chasm	1380
43. Mostovo	Zmiin Borun cave	930
44. Nadartsi	Nadarskata Peshtera cave	1180
45. Nedelino	Vodnata (Godumovata) Peshtera cave	655
46. Orehovo	cave 100 m W of the village	1000
47. Orehovo	cave in a quarry	1000
48. Orehovo	Modarskata Peshtera cave	1635
49. Orehovo	Prilepnata Peshtera cave	1150
50. Pamporovo Resort	Cave (? = Sbirkovata Peshtera cave)	1420
51. Pamporovo Resort	Mechata Dupka cave	1560
52. Peshtera	Hralupata cave	600
53. Peshtera	Lilova Skala cave	730
54. Peshtera	Novata Peshtera cave	550
55. Peshtera	Snezhanka cave	860
56. Peshtera	Ushatovi Doupki cave	765
57. Peshtera	Vodnata Peshtera cave	880
58. Peshtera	Yubileyna cave	580
59. Pletena	Banyan cave	850
60. Potoka	Tipitseto cave	1310
61. Progled	Sbirkovata Peshtera cave	1430
62. Ravnogor	Pavla cave	1320
63. Ribnovo	Manuilovata Peshtera cave	1150
64. Ribnovo	Skoka cave	1100
65. Slashten	Stapalkata cave	650
66. Smilyan	Kraipatnata Peshtera cave	780
67. Stoykite	tunnel in the village	1420
68. Trigrad	Dodalitsa II cave	1200
69. Trigrad	Dyavolskoto Garlo cave	1100
70. Trigrad	Gorni Razh № 3 cave	1240
71. Turyan	Garvanyovitsa cave	1050
72. Varba	Disused mine gallery	920
73. Varba	water derivation gallery	1023
74. Velingrad	cave ca. 400 m above Lepenitsa cave	1060
75. Velingrad	Lepenitsa cave	980
76. Velingrad	Suhata Peshtera cave	890
77. Yagodina	Dolna Karanska Dupka cave	1030

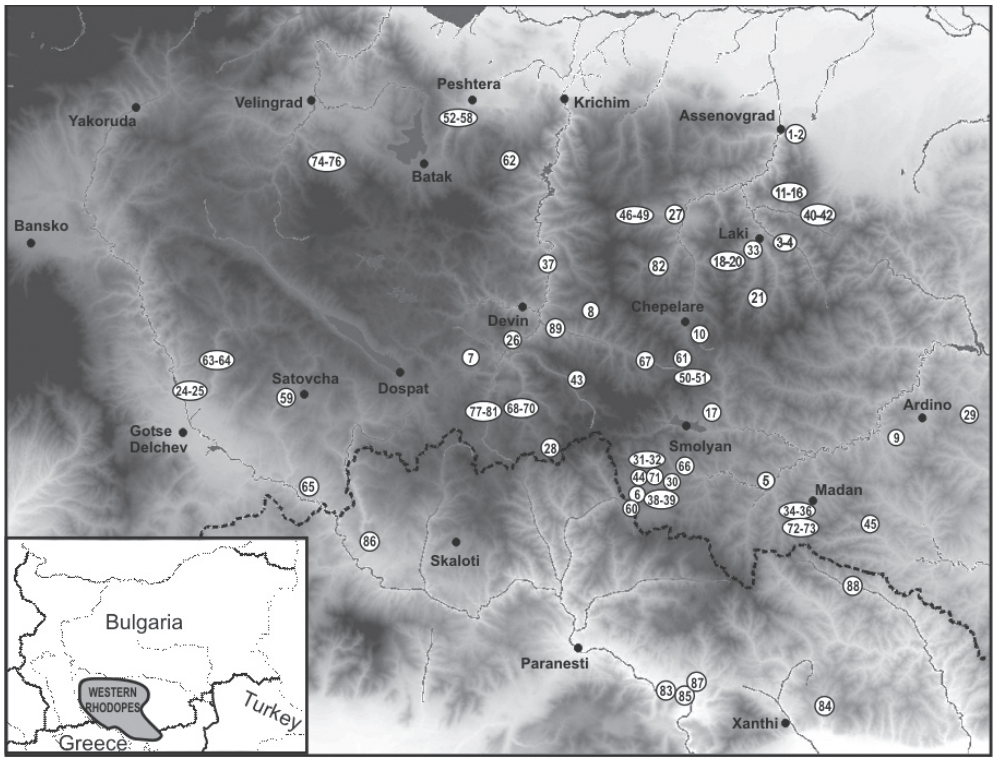
Appendix 1. Continued.

Village or Town	Locality	Alt. (m)
78. Yagodina	Gorna Karanska Dupka cave	1080
79. Yagodina	Karnata Peshtera cave	1080
80. Yagodina	Sanchova Dupka cave	990
81. Yagodina	Yagodinskata Peshtera cave	1040
82. Zabardo	Tyovnata Dupka cave	1135
Greece		
83. Galani	Cave	70
84. Kimmeria	Gallery	150
85. Paradisos	cave in the military area	50m
86. Potami	cave Folia Drakou in Dospat Dere valley (Despatis valley)	550
87. Toxotes	Railway tunnel	50
88. Kompsatos Valley between Kato Thermes and Termiko Loutraki	volcanic cave	400

Additional underground locality

Bulgaria		
89. Devin	small gallery on the road	710

Appendix 2. Map of the underground localities (n= 89 caves and galleries) of bats in the Western Rhodopes Mt. Enumeration as in Appendix 1.



Appendix 3. Ringing and recapture data from bats caught in the Western Rhodopes.

Species	Ringing data	Recapture data	Migration	Study period	Reference
M. capaccinii, female, London Zoo Y6034	Greece, Koufovouno cave, Eastern Rhodopes, 2002-2004, EP	Bulgaria, Ivanova Voda cave, Western Rhodopes, 4.2.2006, BP, NS	144 km	3 years	Papadatou et al. 2009
M. capaccinii, female, London Zoo Y6060	Idem.	Idem.	144 km	3 years	Papadatou et al. 2009
M. capaccinii, female, London Zoo Y6087	Idem.	Idem.	144 km	3 years	Papadatou et al. 2009
M. capaccinii, female, London Zoo Y7292	Idem.	Idem.	144 km	3 years	Papadatou et al. 2009
M. capaccinii, female, London Zoo Y7706	Idem.	Idem.	144 km	3 years	Papadatou et al. 2009
M. capaccinii, male, London Zoo Y7479	Greece, Cave of Cyclops, 2002-2004, EP	Bulgaria, Gargina Dupka cave, 10.9.2008, BP	113 km	3 years	Papadatou et al. 2009
M. schreibersii, male, NMNH Sofia, A00073	Bulgaria, Manuilovata Peshtera cave, 22.6.2000, BP	Bulgaria, Manuilovata Peshtera cave, 3.3.2007, BP	0 km	7 years	New record

EP- Elena Papadatou; **BP-** Boyan Petrov, **NS-** Nikolay Simov

Appendix 4. A surface area calculation using four density estimates (i.e. number of squares with density of <40, ca. 40, ca. 60 and ca. 120 individuals) showed that the hibernation colony of *Miniopterus schreibersii* in Dyavolskoto Garlo cave on 10th January 2010 has a minimal number of **26 580** ind. However considering the possible underestimation due to observer bias and presence of small clusters beyond this panorama picture, the maximal number was estimated as **28 000** individuals. Merging of the pictures have caused certain distortion of the surface.

Appendix 5. External measurements of some examined specimens from the Western Rhodopes. In Bulgaria, all bats presented in the table were measured by B. Petrov, in Greece by C. Dietz. Reference points as in DIETZ & VON HELVERSEN (2004).

SPECIES	SITE	SEX	FA	L	C	A	D1	Claw	D3	D4	D5	WS	G	TrL	TrW	Tib	HF	Note
Barbastella barbastellus	BG Ribnovo, Manuilovata Peshtera cave, 22.6.2000	M ad.	39,0	50,0	49,0	14,0			67,0	53,0	50,0	278	9					
Myotis brandtii	BG Progled, Sbirkovata Peshtera cave, 6.8.1999	M ad.	36,2	39,0	39,0	13,0			53,5	46,0	43,5	230	5,5					
Myotis alcathoe	GR Ford of Kompsatos River between Medousa and Kotani, 15.6.2004	F ad.	31,9						52,8		41,4		5,9					Pregnant
Myotis cf. *alcathoe*	BG Gela, Lednitsata cave, 18.9.2005	F ad.	33,0	44,0	33,0	12,0			53,0	45,0	42,0	231						Brown ears
Myotis cf. *alcathoe*	BG Gela, Lednitsata cave, 18.9.2005	F ad.	32,2	43,0	33,0	11,5			51,5	43,3	41,0	228						Brown ears
Myotis cf. *brandtii*	BG Dobrostan, Ivanova Voda cave, 20.5.1998	F ad.	35,0	44,0	37,0	13,5			52,5	45	43,0	236	6					
Myotis mystacinus	GR River ford between Melivia, Kotili and Dimari, alt. 490 m, 17.6.2004	M ad.	34,9						58,6		45,6		6,2			16,4	6,9	
Myotis mystacinus	Idem.	M ad.	34,1						56,7		45,1		5,6			15,7	7,3	
Myotis mystacinus	Idem.	F ad.	34,3						55,8		44,3		7,6			16,2	6,9	Post lactating
Myotis mystacinus	GR N of Xanthi, the Turkish Bridge, alt. 200 m, 19.6.2004	M ad.	35,2						56,8		45,7		5,8			16,8	7,1	

Appendix 5. Continued.

SPECIES	SITE	SEX	FA	L	C	A	D1	Claw	D3	D4	D5	WS	G	TrL	TrW	Tib	HF	Note
Myotis cf. *mystacinus*	BG Gela, Lednitsata cave, 18.9.2005	M ad.	34,2	46,0	40	12,0			54	46,5	43,0	235						Black ears
Myotis cf. *mystacinus*	BG Progled, Sbirkovata Peshtera cave, 6.8.1999	M ad.	35,8	44,0	37,8	13,0			57	50	46,5	244	5,5					Black ears
Myotis cf. *mystacinus*	Idem.	Mad.	35,0	46,0	35,0	13,5			57	47,5	44,5	235	5,5					Black ears
Myotis cf. *mystacinus*	Idem.	M ad.	34,6	46,0	37,0	12,0			56,2	47,2	44,0	235	5					Brown ears
Myotis cf. *mystacinus*	Idem.	M ad.	36,0	40,0	39,5	13,0			57,0	48,0	45,0	242	5,5					Brown ears
Myotis daubentonii	BG Yagodinskata Peshtera cave, 17.9.2005	F imm	39,8		41,0	12,0			63,0	53,0	50,0	271	10					Chin- spot
Myotis daubentonii	BG Dyadovtsi, Dyadovksiya kemer, 30.7.1999	F imm	38,6	47,0	38,0	17,4			66,4	53,3	51,6	257	6,5					
Myotis daubentonii	idem.	F imm	38,3	47,0	37,0	17,2			65,0	52,8	50,0	258	6,5					
Myotis daubentonii	idem.	F ad.	39,5	44,0	36,5	17,5			62,0	51,4	50,0	250	6,2					
Myotis daubentonii	idem.	F ad.	40,5	47,0	45,5	17,5			66,0	53,0	51,0	270	7,9					
Myotis daubentonii	idem.	F ad.	40,5	46,0	42,5	17,4			66,0	54,5	50,5	262	6,5					
Myotis daubentonii	idem.	F ad.	41,2	45,0	42,0	17,0			68,0	55,0	51,2	275	7					
Myotis daubentonii	idem.	F ad.	39,0	43,0	39,0	16,5			65,0	53,0	50,0	262	7,5					

Appendix 5. Continued.

SPECIES	SITE	SEX	FA	L	C	A	D1	Claw	D3	D4	D5	WS	G	TrL	TrW	Tib	HF	Note
Myotis daubentonii	idem.	M ad.	37,5	46,5	35,0	16,0			61,0	51,0	48,0	254	6,5					
Myotis emarginatus	BG Progled, Sbirkovata Peshtera cave, 6.8.1999	M ad.	38,5	47,0	37,0	15,0			59,0	49,5	48,5	255	7,0					
Myotis emarginatus	BG Borikovo, Borikovskata Peshtera cave, 19.3.2004	F ad.	40,0	45,0	38,0	15,0			63,0	52,0	45,0	270	7,0					
Myotis emarginatus	GR Ford of Kompsatos River between Medousa and Kotani, 18.6.2004	M ad.	38,2						63,3		51,7		6,9					
Nyctalus noctula	BG Mihalkovo, tunnel, 1.9.2001	F ad.	54,0		48,0	15,0			90,0	75,0	54,0	370	34,0					
Nyctalus noctula	GR Ford of Kompsatos River between Medousa and Kotani, 15.6.2004	M ad.	52,1						91,8		53,0		31,3					
Nyctalus noctula	Idem.	M ad.	55,2						92,3		54,5		31,6					
Nyctalus noctula	Idem.	M ad.	52,6						92,4		53,5		30,1					
Nyctalus noctula	Idem.	M ad.	54,1						91,4		54,5		28,4					
Nyctalus noctula	Idem.	M ad.	53,2						89,8		52,6		28,5					
Nyctalus noctula	Idem.	M ad.	54,5						90,5		55,5		27,5					
Nyctalus noctula	idem, 18.6.2004	M ad.	52,9						87,1		51,4		27,3					

Appendix 5. Continued.

SPECIES	SITE	SEX	FA	L	C	A	D1	Claw	D3	D4	D5	WS	G	TrL	TrW	Tib	HF	Note
Nyctalus noctula	idem, 18.6.2004	M ad.	54,0						95,8		56,8		33,8					
Nyctalus noctula	idem, 18.6.2004	M ad.	51,3						87,8		52,9		28,9					
Nyctalus noctula	idem, 18.6.2004	M ad.	50,3						87,3		50,3		27,7					
Nyctalus leisleri	GR River ford between Melivia, Kotili and Dimari, alt. 490 m, 17.6.2004	M ad.	42,7						74,1		47,4		13,7					
Nyctalus leisleri	GR Ford of Kompsatos River between Medousa and Kotani, 18.6.2004	M ad.	43,3						75,6		46,6		12,6					
Nyctalus lasioptetus	GR Ford of Kompsatos River between Medousa and Kotani, 15.6.2004	F ad.	66,4						108,6		71,2		47,2					
Pipistrellus pipistrellus	BG Belitsa, natural rock bridge, 30.8.2001	M ad.	30,0	33,0	32,0	8,0			52,0	46,0	38,0	205	4					Light yellow penis
Pipistrellus pygmaeus	GR River ford between Melivia, Kotili and Dimari, alt. 490 m, 17.6.2004	F ad.	30,6						51,3		37,3		6,1					Pregnant, orange vagina
Pipistrellus pygmaeus	Idem.	M ad.	28,3						49,6		36,0		3,8					
Pipistrellus nathusii	GR River ford between Melivia, Kotili and Dimari, alt. 490 m, 17.6.2004	M ad.	34,1						61,8		45,3		6,2					
Hypsugo savii	BG Mihalkovo, house, 1.9.2001	M ad.	33,0	42,0	38,0	10,0			57,0	50,0	42,0	235	7,5					

Appendix 5. Continued.

SPECIES	SITE	SEX	FA	L	C	A	D1	Claw	D3	D4	D5	WS	G	TrL	TrW	Tib	HF	Note
Hypsugo savii	Idem.	M ad.	33,0	42,0	35,0	10,0			55,5	50,0	41,0	230	6,5					Big testes
Hypsugo savii	Idem.	M ad.	34,5	46,0	38,0	10,0			55,5	48,0	41,0	240	7					Big testes
Hypsugo savii	GR Ford of Kompsatos River between Medousa and Kotani, 18.6.2004	F ad.	34,0						57,4		41,6		9,2					Pregnant
Plecotus auritus	BG Gela, Lednitsata cave, 18.9.2005	M ad.	38,3	44,0	45,0	32,0	6,8	3,0	62,0	49,0	50,0	268		14,0	4,7			
Plecotus auritus	Idem.	F ad.	39,5	48,0	46,0	32,2	6,8	2,8	64,0	52,0	53,0	276		14,0	4,7			
Plecotus auritus	Idem.	M ad.	40,0	44,0	48,0	30,5	7	2,8	64,0	50,5	52,0	278	7,5	14,9				
Plecotus auritus	BG Progled, Sbirkovata Peshtera cave, 6.8.1999	M ad.	40,0	47,0	45,0	34,0	7,2		65,0	52,0	52,0	270	7,3	14,0				
Plecotus austriacus	BG Mogilitsa, 14.7.2006	F ad.	40,0	51,0	45,0	32,0	6,5	1,8	66,0	54,0	52,0	280		15,5	6			Pregnant
Plecotus austriacus	GR N of Xanthi, the Turkish Bridge, alt. 200 m, 19.6.2004	M ad.	38,9						66,3		52,7		8,3					

Legend: length of forearm (FA), length of body (L), tail length (C), ear length (A), length of thumb and claw (D1/Claw), length of third, fourth and fifth finger (D3, D4, D5), wingspan (WS), body weight in grams (G), hind foot length (HF), tibia of the lower leg (Tib), tragus length (TrL) and tragus width (TrW). All measurements in milimeteres.

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Prof. Otto von Helversen crossing a river near the Turkish Bridge north of Xanthi (Greece, 19th June 2004, photo by C. Dietz).

Прилепите (Mammalia: Chiroptera) в Западните Родопи (България и Гърция)

Боян ПЕТРОВ, Ото фон ХЕЛВЕРСЕН

(Резюме)

Западните Родопи (11 220 кв. км) предлагат изключително високо разнообразие от естествени местообитания и природни условия. От 35-те вида прилепи известни в границите на континентална Европа, 30 вида от четири семейства обитават тази планина- Rhinolophidae, 5 вида; Vespertilionidae, 23 вида; Miniopteridae, 1 вид; Molossidae, 1 вид. В българските части на планината (8 732 кв.км) са установени 27 вида (без *Pipistrellus nathusii, Myotis alcathoe* и *Rhinolophus mehelyi*), а в Гърция (2 488 кв.км)- 28 вида прилепи (без *Plecotus auritus* и *Myotis brandtii*). *Myotis mystacinus* s.l. и *Nyctalus leisleri* се съобщават за първи път от българските части на изследваната територия. *Rhinolophus hipposideros*, *Rh. euryale*, *Rh. blasii*, *Plecotus austriacus*, *Nyctalus noctula*, *Pipistrellus pygmaeus* и *Barbastella barbastellus* са нови за гръцките части на планината. Срещането на *Myotis aurascens* се нуждае от потвърждение с генетични методи. Прилепи са открити общо в 164 находища- 128 в България (от тях 83 са пещери и минни галерии) и 36 (от тях 6 пещери и галерии) са в Гърция. 65% от находките на прилепи в България произхождат от подземни убежища. В Гърция, едва 16% от находищата са от пещери. Общо за планината, най-често срещани са пещеролюбивите прилепи- *Rhinolophus hipposideros* (в 46% от находищата), *Rh. ferrumequinum* (33%), *Myotis myotis* (19%), *M. blythii* (18%) и *Miniopterus shreibersii* (16%).

Въпреки големите площи покрити с широколистни и смесени гори, горско живеещите видове прилепи като *Myotis bechsteinii* (3.7% от находищата), *M. nattereri* (6.1%), *Barbastella barbastellus* (4.3%) и *Nyctalus* spp. (2.5-7.4%) са значителено порядко срещани при уловите с мрежи. Общо в седем района е установено повисоко видово разнообразие и численост на прилепите- Триград-Ягодина (19 вида), Горна Арда (13 вида), Пещера (12 вида) и Добростан (10 вида). В Гърция- Долината на река Компсатос между Медуза и Котани, долината на река Аркодоурема около Дипотама и в района на Токсотес-Галани са установени по 12 вида прилепи. Пет пещери в България- Дяволското гърло (с. Триград), Иванова вода (с. Добростан), Гаргина дупка (с. Мостово), Мануиловата пещера (с. Рибново) и Ухловица (с. Могилица) са определени като Значими подземни местообитания на прилепи по критериите на EUROBATS. Най-важната пещера за зимуването на *Miniopterus schreibersii* е Дяволкото гърло, в която са наблюдавани до 40 800 екз. Има основания да се счита, че в тази пещера зимуват екземпляри от летни колонии живеещи в 100-120 км радиус, което освен България включва Северна Гърция и вероятно източните части на Република Македония. Биометрични данни на 55 екз. от 15 по–редки видове прилепи, данни за опръстенявания и миграции, както и карта за местоположението на 89 изследвани пещери и галерии са представени в приложения.