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Bats (Mammalia: Chiroptera) of the Eastern Mediterranean. Part 3. Review of bat distribution in Bulgaria

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Abstract. A complete list of all bat records so far available from Bulgaria was compiled from literary references and original data. It is supplemented with distribution maps and a brief summary of the distributional status of each species, tables of measurements of newly recorded bat specimens, and some ecological or taxonomic notes. In total, at least 32 species of bats have been recorded in 2127 localities in Bulgaria, viz., *Rhinolophus ferrumequinum* (Schreber, 1774) (296 records), *R. hipposideros* (Bechstein, 1800) (274), *R. euryale* Blasius, 1853 (104), *R. mehelyi* Matschie, 1901 (29), *R. blasii* Peters, 1866 (60), *Myotis myotis* (Borkhausen, 1797) (184), *M. blythii* (Tomes, 1857) (117), *M. bechsteinii* (Kuhl, 1817) (27), *M. nattereri* (Kuhl, 1817) (34), *M. emarginatus* (Geoffroy, 1806) (73), *M. mystacinus* (Kuhl, 1817) or *M. alcathoe* Helversen et Heller, 2001 (11; plus 23 unspecified records of *M. mystacinus* s. l.), *M. aurascens* Kusjakin, 1935 (22), *M. brandtii* (Eversmann, 1845) (7–9), *M. daubentonii* (Kuhl, 1817) (36), *M. dasycneme* (Boie, 1825) (1), *M. capaccinii* (Bonaparte, 1837) (79), *Vespertilio murinus* Linnaeus, 1758 (23), *Eptesicus serotinus* (Schreber, 1774) (79), *E. nilssonii* (Keyserling et Blasius, 1839) (1), *Hypsugo savii* (Bonaparte, 1837) (67), *Pipistrellus pipistrellus* (Schreber, 1774) (28, plus 63 unspecified records of *P. pipistrellus* s. l.), *P. pygmaeus* (Leach, 1825) (1), *P. nathusii* (Keyserling et Blasius, 1839) (28), *P. kuhlii* (Kuhl, 1817) (9–10), *Nyctalus noctula* (Schreber, 1774) (92), *N. leisleri* (Kuhl, 1817) (12–13), *N. lasiopterus* (Schreber, 1780) (11), *Barbastella barbastellus* (Schreber, 1774) (23), *Plecotus auritus* (Linnaeus, 1758) (28), *P. austriacus* (Fischer, 1829) (101), *Miniopterus schreibersii* (Kuhl, 1817) (174), and *Tadarida teniotis* (Rafinesque, 1814) (10). Several other species, such as *Plecotus kolombatovici* Đulić, 1980 and *P. macrobullaris* Kuzjakin, 1965, were recorded in closest neighbourhood of the Bulgarian territory and are looked upon as possible candidates for the fauna of Bulgaria. Based on structural differences in bat fauna, the territory of Bulgaria was subdivided into three major faunal regions: (I) Higher mountains (Balkan and Rila-Rhodopes Massifs and adjacent karstic regions, incl. the Mediterranean Struma and Mesta valleys), (II) Karstic lowlands and uplands (parts of Danubian and Upper Thracian Lowlands and the Eastern Balkan Mts.), and (III) the Black Sea region (incl. the Strandža Mts. and Ludogorie Plateau). Composition of the bat fauna shows a strong primary W-E gradient and then only a secondary N-S one.

Zoogeography, distribution, fauna, Chiroptera, Balkan peninsula, Bulgaria, Palaearctic region

INTRODUCTION

The territory of the present Republic of Bulgaria (110,993 km^2) covers the central and eastern parts of the Balkan Peninsula and, from the biogeographic point of view, it presents a broad transitional zone between realms of the Mediterranean arboreal and the European mixed forests in south-eastern Europe. The territory of Bulgaria includes various habitat types, from semi-arid steppe and

coastal shrub woods to forests and alpine meadows in high mountains (Fig. 1). It lies at the zone of intergradation of the Mediterranean subtropic climate (which essentially influences the southern part of the country) and the temperate climates with maximum precipitation in spring and autumn.

Bulgaria is adjacent and widely open towards the Black Sea and the Danubian Lowland. A large central area of the country belongs to the belt of chain-folded alpinid mountains of the Carpathian-Balkan system (the Balkan Mts. [= Stara Planina Mts.], 2376 m a. s. l.). The Balkan Mts. build mostly of the Upper Mesozoic carbonate rocks are bordered by old fault mountain system of the Rila-Rhodopes Mts. (with peaks at 2925 m a. s. l.), which core is build by a crystalline rocks. The lowland of the Danube valley completes the relief diversity and builds the possible relay with the vast East European plain while the valleys of rivers Struma, Mesta and Marica broadly incissed into the mountain relief of southern Bulgaria interconnect the region directly with the lowlands of true Mediterranean. About one fourth of the total square of the country lies in the montane altitudinal zone (above 800 m a. s. l.) while at the same time the eastern and northern part of the country is nearly at the altitude of sea level. The effect of extreme declivity, greatly variegated mosaic relief and extensive predominace of carbonate rocks results in intesive a very diversed karstification. The karstic landscape covers about 23% of the country, and frequently takes forms of monumentous rocky cliffs and spacious natural caves (over 4200 caves are known in Bulgaria). The unique geographic position, diverse relief and climate as well as the structurally greatly variegated landscape continuously, for more than 8000 years, extensivelly impacted by postneolithic antropogenic rearrangements, set the pattern for the very high biodiversity (cf. Sakaljan & Majni 1993).

In full this hold also for the bat fauna of Bulgaria. It should be emphasized, of course, that also amount of information on distribution, faunal and taxonomical status of bats is here much larger than in any other country of the SE Europe and/or SE Mediterranean (comp. Benda & Horáček 1998, Hanák et al. 2001, Uhrin et al. 1996, Kryštufek et al. 1992, 1998).

Compared to other parts of the Balkan Peninsula where the research on mammals at the systematic level did not start until the period between World War I and II or even later (Hanák et al. 2001), the research on the mammals in Bulgaria, including its bat fauna, had started much earlier, already in the late 19th century, that is, at the very beginning of the recent history of the Bulgarian state. The bat fauna of Bulgaria was thoroughly reviewed by Bureš (1917) for the first and by Hanák & Josifov (1959) for the second time. Since that time the amount of data increased almost explosivelly. In most species, the currently demonstrated distributional statuses differ much of any previous expectations and in respect to the extent of background information they can be considered quite realistic. In short, comparing to our previous survey on the Eastern Mediterranean bats (Benda & Horáček 1998, Hanák et al. 2001), this one examplifies a region which bat fauna is actually comprehended into great details and provides the most reliable information on the subject over whole the E-Mediterranean region.

Bat research in Bulgaria

The first data on the recent mammal fauna of Bulgaria were published by Hristovič (1892). He stressed the very interesting zoogeographical position of the country and listed all known records of mammals, among them, two bat species, viz. *Rhinolophus ferrumequinum* and *Myotis myotis*. Later, V. Kovačev, a secondary school teacher, founded a nature collection in the town of Ruse on the basis of which he published records of the following bat species: *Rhinolophus ferrumequinum*, *R. hipposideros*, *Myotis myotis*, *Pipistrellus pipistrellus*, *Nyctalus noctula*, *N. leisleri*, *Plecotus auritus*, and *Miniopterus schreibersii* (Kovačev 1894, 1906, 1908). At the beginning of the 20th century Dr. Ivan Bureš started scientific research on Bulgarian caves and founded the bat

collection at the National Museum of Natural History in Sofia. In his first paper specially concerned with bats of Bulgaria (Bureš 1917), he listed six new species for the country: *Rhinolophus euryale*, *Myotis mystacinus*, *Eptesicus serotinus*, *Vespertilio murinus*, *Pipistrellus nathusii*, and *Nyctalus lasiopterus*, and gave detailed descriptions of the external and dental morphology of all 14 Bulgarian bat species known at that time. Dr. Bureš also assisted the Russian professor P. Bahmet'ev (University of Sofia) who described for the first time the condition of anabiosis in mammals, based on experiments with bats. Bureš (1924, 1925, 1926) was also the first author who stressed the importance of "bat caves" in Bulgaria. In the period 1920–1945 the study of caves and cave fauna continued intensively under his leadership (Atanasov 1936a, b, 1942). In that period Bulgaria was also visited by a number of foreign naturalists who recorded several new bat species as well as new distributional data on already known species as *Barbastella barbastellus*, *Myotis blythii*, *M. bechsteinii*, *M. emarginatus*, *M. capaccinii*, and *M. daubentonii* (Boetticher 1925, Heinrich 1936, Wolf 1940). It was also Dr. I. Bureš who in 1940 applied, for the first time in Bulgaria, the method of bat banding in order to study their migrations (Bureš 1941, 1942). In 1955 a group of students – Vladimir Beškov, Mihail Kvartirnikov, Tanju Mičev and Petăr Beron – undertook with enthusiasm the cave research and bat banding. In the 1960s the number of banded bats was 3296, with numerous registered recaptures and data on the migration behaviour of certain species (Beron 1958, Bureš & Beron 1962, Beron 1963). Afterwards, bat banding in Bulgaria was stopped.

After 1950, occasional bats were mentioned in regional faunal studies (Markov 1955a, b, Markov & Hristov 1960). The list of species was subsequently enlarged by records of *Rhinolophus blasii* and *Myotis ikonnikovi* (= *M. mystacinus* s. l., cf. Hanák 1965, Benda & Tsytsulina 2000)

Fig. 1. A general map of Bulgaria; main geographical features mentioned in the text (shaded, area above 800 m a. s. l.).

Tab. 1. The mode used for the transliteration of Bulgarian Cyrillic into Latin letters throughout the List of species

record in Cyrillic		Latin transliteration	record in Cyrillic		Latin transliteration
А а	.....	A a	П п	.....	P p
Б б	.....	B b	Р р	.....	R r
В в	.....	V v	С с	.....	S s
Г г	.....	G g	Т т	.....	T t
Д д	.....	D d	У у	.....	U u
Е е	.....	E e	Ф ф	.....	F f
Ж ж	.....	Ž ž	Х х	.....	H h
З з	.....	Z z	Ц ц	.....	C c
И и	.....	I i	Ч ч	.....	Č č
Й й	.....	J j	Ш ш	.....	Š š
К к	.....	K k	Щ щ	.....	Št št
Л л	.....	L l	Ъ ъ	.....	Ă ă
М м	.....	M m	Ю ю	.....	Ju ju
Н н	.....	N n	Я я	.....	Ja ja
О о	.....	O o	ь	.....	’

(Kvartirnikov 1957), *Rhinolophus mehelyi* (Hanák & Josifov 1959), *Hypsugo savii* (Beron 1961), *Tadarida teniotis* (Kalčev & Beškov 1963), *Plecotus austriacus* (Beron 1964a, Gaisler & Hanák 1964), *Myotis brandtii* and *M. nattereri* (Horáček et al. 1974), *Eptesicus nilssonii* (Hanák & Horáček 1986), *Pipistrellus kuhlii* (Popov & Ivanova 1994), *Myotis aurascens* (Benda & Tsytsulina 2000), *Myotis dasycneme* (Limpens 2000), and *Pipistrellus pygmaeus* (Dietz et al. 2002). Hanák & Josifov (1959) summarized all, at that time available faunal data on bats in Bulgaria. The paper by Gueorguiev & Beron (1962) set up the series "*Essai sur la faune cavernicole de Bulgarie*" in which updated lists of animals, including bats (Beron 1962), found in caves in Bulgaria were published (Beron & Gueorguiev 1967, Beron 1972, Beron 1994). Data on the biology of several species were published by Beron (1959) – *Plecotus*, and by Beškov & Beron (1962) – *B. barbastellus*, *E. serotinus* and *M. emarginatus*.

In the period 1960–1995, the studies were mostly directed to cave-dwelling bat species (cf. Beron 1986). Numerous data were gathered on their distribution as well as size of colonies (Beron 1964b, Beškov 1993, Beshkov 1998, Grimmberger 1993, Hazelton 1970, Pandurska 1993, 1994). In the 1970s and 1980s, intensive investigations, employing mist-netting for the first time, were implemented by a team of Czech zoologists led by Ivan Horáček, Vladimír Hanák and Vladimír Vohralík. The faunal data on bats obtained by them are summarized in the present contribution; though a smaller part of them has already been reported in frame of taxonomical or ecological studies (Horáček et al. 1974, Horáček & Zima 1978, Hanák & Horáček 1984, 1986, Horáček & Hanák 1984, 1986, Kryštufek 1993, Benda & Horáček 1995, Benda & Tsytsulina 2000, Benda & Ivanova 2003).

Until recently, studies on the biology and ecology of bats in Bulgaria were few in number. They were concerned with such topics as the structure of summer colonies of cave-dwelling bat species (Gaisler 1966), temperature preferences during hibernation (Gaisler 1970a), mating behaviour in *Myotis blythii* (Horáček & Gaisler 1986), problems of cave-dwelling (Horáček 1984), altitudinal distribution and diversity (Pandurska 1993, 1996), physiological questions (Pandurska-Whitcher & Shanov 2003), or osteology (Kowatschev & Simeonov 1970). Karyological data were published on six bat species: *Rhinolophus ferrumequinum*, *R. hipposideros* (Belcheva et al. 1990), *M. myotis*, *M. blythii*, *P. austriacus* (Belcheva et al. 1992), and *Hypsugo savii* (Zima 1982). Fossil remains of bats were studied from deposits in caves (Horáček 1982, Woloszyn 1982, Horáček & Hanák 1989, Popov 2000, Popov & Pandurska 2000). Numerous data on host distribution were provided by

intensive studies of bat parasites, such as unicellular parasites (Kučera 1979), helminths (Bǎčvarov 1963, Jančev 1970, 1971, Jančev & Stojkova 1973, Hošek 1985, Genov 1969, Genov et al. 1992), fleas (Martino 1955, Hůrka 1965, 1970, 1976, 1984b, 1997), parasitic flies (Hůrka 1958, 1962, 1984a, Skuratowicz 1970, Skuratowicz et al. 1982, Nowosad et al. 1987, Ivanova et al. 1995), mites and ticks (Drenski 1955, 1961, Beron 1965, 1968, 1970, 1973a, b, 1974a, b, 1977, Beron & Kolebinova 1964, Kolebinova 1967, 1968, 1979, 1982, Kolebinova & Beron 1965, Dusbábek 1964a, b). The study of owl diet, based on analysis of owl pellets, also reveals some data on bat distribution (Simeonov 1978, 1983, 1985, Simeonov & Boev 1988, Simeonov et al. 1981, Mitev 1995, Obuch & Benda 1996). The history of bat research in Bulgaria in the period 1900–1994 was discussed by Beškov (1993), Beshkov (1998), and Ivanova (1995).

Since the 1990s, a new programme of bat research in Bulgarian started, namely with appearnace of a new generation of bats specialists. The bat studies at that period were primarily focused to (1) completing the regional faunal information on karstic landscape in northern Bulgaria (Popov & Ivanova 1995), valley of the Struma river (Petrov 1997, 2001), underground roosts in the Balkan Mts. (Ivanova 1998, Beron et al. 2000a, Pandurska & Beshkov 1998a, Pandurska et al. 1999), mountains of southern Bulgaria (Beron et al. 2000b, Pandurska & Beshkov 1998b, Ivanova 1997, 2003, Ivanova & Gueorguieva in press, Ivanova et al. 2003), caves in the Predbalkan area (Pandurska 1999, 2003), Rusenski Lom National Park (Undžijan 1999); and (2) studies on the distribution, morphology and ecology of particular species: *Rhinolophus* spp. (Pandurska 1997a, b, Popov & Ivanova 2002), *Myotis myotis* (Pandurska 1998), *Myotis emarginatus* (Pandurska 2000, Pandurska-Whitcher & Pandourski 2002), *Barbastella barbastellus* (Pandurska & Ivanova 2003), *Plecotus* spp. (Benda & Ivanova 2003), *Miniopterus schreibersii* and *Myotis bechsteinii* (T. Ivanova and B. Petrov, pers. comm.).

In 1997 the non-governmental organization Bat Research and Protection Group (BRPG) was established. BRPG operates in close collaboration with the National Museum of Natural History in Sofia towards establishing a national Centre for Bat Research and Protection. Recent projects are aimed at the development of a national monitoring schedule for cave-dwelling bats; development and support of a database of bats in Bulgaria; establishing a banding centre; training and use of ultrasound detector methods for the study of bats; echolocation studies on selected species (*Rhinolophus euryale*, *R. blasii*, *R. mehelyi*, *Myotis capaccinii*, *M. myotis*, *M. blythii*, *Hypsugo savii*, *Miniopterus schreibersii*) (Siemers 2000, Wagner 2001, Nissen et al. 2001); radio telemetry studies on foraging habitats of *Rhinolophus* species and *Myotis bechsteinii*; studies of tree-dwelling bat species, including the setting up of over 200 concrete bat boxes (Ivanova 2000b, Ivanova & Petrov 2001).

Although the major results of these projects are in new data on biology of Bulgarian bats and as such they will be presented elsewhere, they all simultaneously produced a number of new faunal records which supplements the distributional information obtained by previous studies and thus are also included in this report. We hope that succeded to compile the actually complete list of all faunal information up to date available from Bulgaria.

In the descriptions of records, the Latin transcription of geographic names, originally written in Bulgarian Cyrillic, has been unified according to the Berlin system (see Tab. 1), also used in the relatively similar and readily accessible map atlas "Atlas für Motor-touristik Bulgariens, 1:500.000". Sofija: KIPP für Kartographie, 183 pp., 1984. This transliteration mode is also used for the Bulgarian titles of literary sources quoted in the Reference list. All Bulgarian words (locality names) in the lists of records are written with first caps letters.

The lists of records (arranged in alphabetical and/or chronological order) include, for each item, the following information: name of district (in spaced types), name of the locality (each record is primarilly listed by a name of nearest settlement) [in brackets, number of locality as indicated in the map; in *italics*, those not indicated in the map], and/or description of record site, date, number of recorded bats with indication of their sex (m = male, f = female), age (j = juvenile, s = subadult, a = adult) and physiological condition (G = pregnancy, L = lactation) and,

in some instances, the collection of museum material deposition (IVB = Institute of Vertebrate Biology, Brno, Czech Republic; ZFMK = Museum Alexander Koenig, Bonn, Germany; NMNHS = National Museum of Natural History, Sofija, Bulgaria; NMP = National Museum (Natural History), Prague, Czech Republic [collection numbers are given with the prefix "P6V"]; NMW = Natural History Museum, Vienna, Austria; ZIN = Zoological Institute of Russian Academy of Sciences, St. Petersburg, Russia; ZMMU = Zoological Museum of the Moscow State University, Moscow, Russia), collection number and type of preparation (A = alcohol specimen, S = prepared skull, B = prepared dry skin).

In the tables (Tabs. 2–10), the following abbreviations were used for body and skull dimensions of examined specimens: LC = head and body length; LCd = tail length; LAt = forearm length; LA = auricle length; LTr = tragus length; G = body weight; LCr = greatest length of skull; LCb = condylobasal length of skull; LCc = condylocanine length of skull; LaZ = zygomatic width; LaI = width of interorbital constriction; LaN = neurocranium width; AN = neurocranium height; CC = rostral width between canines (incl.); M^3M^3 = rostral width between third upper molars (incl.); CM^3 = length of upper tooth-row between CM^3 (incl.); LMd = mandible length; ACo = height of coronoid process; CM_3 = length of lower tooth-row between CM_3 (incl.); LBT = length of tympanic bulla.

LIST OF SPECIES

Rhinolophus ferrumequinum (Schreber, 1774)

Records. **Original data**: B l a g o e v g r a d: Gospodinci, small cave, 23 April 1994: obs. 15 ind.; – Ilindenci, Šaralijskata Peštera cave, 4 Febr. 1995: obs. ca. 100 ind., 15 Febr. 1998: obs. ca. 100 ind., 19 Dec. 2002: obs. 12 ind.; – Kresna, Gara Pejo Javorov, building, 5 April 1991: obs. 11 ind., 7 May 1994: obs. ca. 70 ind., 14 May 1999: obs. ca. 20 ind., 7 April 2000: obs. 28 ind., 10 June 2000: obs. nurs. colony of ca. 80 ind., 30 April 2001: obs. ca. 150 ind.; – Kresna, Gara Pejo Javorov, gallery, 20 July 1990: obs. nurs. colony, 23 Sept. 1990: obs. 18 ind., 5 April 1991: obs. 11+25 ind., 18 May 1991: obs. 120+1 ind., 7 May 1994: obs. ca. 30 ind., 29 June 1997: obs. nurs. colony of ca. 400 ind., 14 May 1999: obs. ca. 200 ind., 7 April 2000: obs. 40 ind., 30 April 2001: obs. 300 ind.; – Kresna, Gara Stara Kresna, tunnel under railway, 19 Dec. 2002: obs. 1 ind.; – Ploski, large cave, 8 July 1980: net. 1m, 2f (NMP 50331–50333 [S+A]; cf. Kryštufek 1993), 18 July 1981: obs. colony of ca. 1000 ind., net. 1ma, 2ms, 1mj, 6fa, 1fs, 2fj (NMP 50345–50357 [S+A]; cf. Kryštufek 1993), 16 July 1982: net. 1fa, 17 July 1982: obs. colony of ca. 550 ind., net. 1ma, 4fa, 1mj, 1fj (coll. 1faL, NMP 50358 [S+B]; cf. Kryštufek 1993), 3 July 1986: obs. colony of ca. 250 ind., 30 July 1994: net. 1fa, 1fs (NMP 50383, 50384 [A]), 31 July 1994: net. 2ma, 1ms, 5fa, 1fs (NMP 50387–50394, 50397 [A]); – Ploski, orchard, 14 August 1987: net. 4fa (NMP 50374–50377 [S+A]; cf. Kryštufek 1993); – Ploski, small cave, 9 June 1990: obs. 20 ind., 22 Sept. 1990: obs. 50 ind., 8 April 1991: obs. 5 ind.; – Ribnovo, Manuilovata Peštera cave, 14 Febr. 1998: obs. 30 ind., 22 June 2000: net. 2ma, 1fa; – Sandanski, gallery, 23 Sept. 1990: obs. 5 ind., 23 April 1991: obs. 1 ind. – B u r g a s: Bilka, Goljam Kamăk hill, cave, 13 July 1979: net. 1fa; – Černomorec, Nos Atija cape, abri, 12 July 1987: obs. 1m, 2f; – Černomorec, gallery n. town, 15 July 1987: obs. 1 ind., 16 July 1987: net. 2m; – Dobromir, gallery in a hill, 30 July 1979: net. 1ma (NMP 49808 [S+A]; cf. Kryštufek 1993); – Kosti, Maharata cave, 8 Jan. 2000: obs. 37 ind.; – Malko Tărnovo, Bratanovskata Peštera cave, 5 Jan. 2000: obs. 38 ind.; – Malko Tărnovo, Goljamata Vitanovska Peštera cave, 6 Jan. 2000: obs. 62 ind.; – Mladežko, Ezeroto cave, 25 August 1999: obs. 1fa, 3 Jan. 2000: obs. 1 ind.; – Mladežko, Lejarnicite cave, 3 Jan. 2000: obs. 10 ind.; – Primorsko, Arkutino, 6 June 1957: obs. 1fa; – Primorsko, Arkutino, water station, building, 13 May 1983: obs. colony of ca. 90 ind., coll. 1fa (NMP 50359 [A]; leg. T. Scholz & D. Král; cf. Hůrka 1984b); – Primorsko, Arkutino, Solenka area, building, 3 July 1995: obs. nurs. colony of ca. 150 ind., 7 July 1996: obs. nurs. colony of ca. 150 ind.; – Primorsko, Maslen Nos cape, Karaul Taš, 17 August 1971: obs. colony of ca. 500 ind., coll. 3ma, 9fa (NMP 38551, 38553–38557, 47/72/C53, C67, C75, C87, C88, C99, C107 [S+B]; cf. Horáček et al. 1974), 18 July 1975: obs. 5 ind.; – Primorsko, Perla, abandoned building, 29 August 2000: obs. nurs. colony of ca. 700 ind.; – Ropotamo, 6 June 1957: coll. 1fa (NMP 49346 [S+B]; leg. M. Josifov, cf. Hanák & Josifov 1959); – Zvezdec, Goljamata Văpa cave, Petrova Niva, 4 Jan. 2000: obs. 3 ind.; – Zvezdec, Părnarot cave, 28 August 1999: obs. 2 ind. – D o b r i č: Albena, sea shore, river mouth, 21 August 1983: net. 1fa; – Kamen Brjag, cave 1 km NE of the town, 11 July 1986: net. 1ms (NMP 50046 [S+B]; cf. Hůrka 1970 [as *R. mehelyi*]), 12 July 1986: net. 1ms (NMP 50051 [S+B]); – Sveti Nikola, Humbata cave, Bolata, 7 April 1994: obs. 1ma; – Tjulenovo, cave, 17 August 1983: net. 6ms, 7fa, 6fs. – G a b r o v o: Drjanovo, Andăka cave, 6 April 1991: obs. 3 ind., 15 April 1996: obs. ca. 200 ind., 31 Jan. 1998: obs. 180 ind., 22 Febr. 1998: obs. ca. 200 ind., 27 July 1998: obs. 40 ind., 20 Jan. 2000: obs. 105 ind.; – Drjanovo, Bačo Kiro cave, 5 April 1991: obs. 55 ind., 15 April 1996: obs. 70 ind., 22 Jan. 1998: obs. 60 ind., 31 Jan. 1998: obs. 30 ind.; – Jantra, Izvora cave, 22 March 1991: obs. 3 ind. – H a s k o v o: Bjal Kladenec, Goljamata Peštera cave, 5 May 1996: obs. 1 ind., 3 March 1999: obs. 3 ind.; – Bjal Kladenec, Karadžainler cave, 10 Oct. 1995: obs. 2 ind., 10 Oct. 1998: obs. 5 ind.; – Dolno Čerkovište, small cave, 30 Sept. 2003: net.

3m, 1f (leg. R. Lučan); – Dolno Čerkovište, Zandana cave, 21 April 1996: obs. 1 ind. (cf. Ivanova 1997), 27 April 1996: obs. 10 ind. (cf. Ivanova 1997), 29 April 1997: obs. 1 ind. (cf. Ivanova 1997), 8 Febr. 1998: obs. 12 ind.; – Gaberovo, Gjurgen Dere, caves, 13 July 1997: obs. 330 ind., 14 April 1998: obs. 3 ind., 19 May 1998: obs. 80 ind., 14 June 1998: obs. ca. 200 ind., 19 July 1998: obs. 10+140 ind.; – Harmanli, building, 13 June 1926: coll. 1fa, 1fj (NMNHS 083, 184); – Lozen, gallery, 12 April 1998: obs. 6 ind.; – Madžarovo, gallery, 3 April 1992: obs. 2ma, 9 July 1995: net. 1 ind., 28 Oct. 2002: obs. 2 ind. (leg. R. Lučan), 29 Sept. 2003: net. 1 ind., obs. 6 ind. (leg. R. 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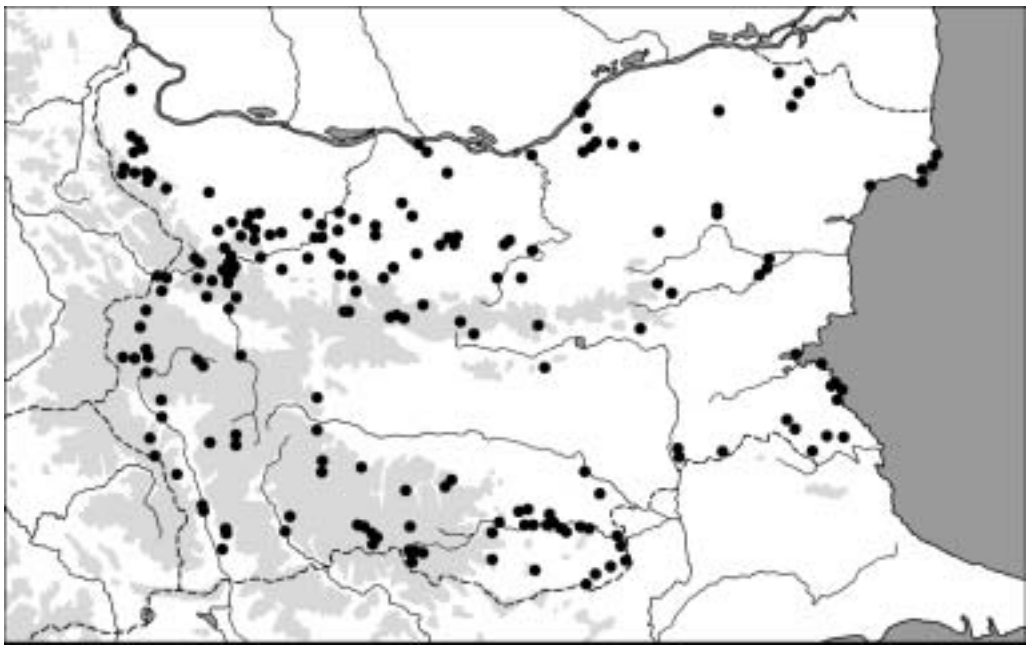

Fig. 2. Records of *Rhinolophus ferrumequinum* (Schreber, 1774) in Bulgaria.

Tab. 2. Basic biometric data for examined Bulgarian samples of *Rhinolophus ferrumequinum* (Schreber, 1774) and *R. hipposideros* (Bechstein, 1800). For abbreviations see p. 250

	Rhinolophus ferrumequinum					*Rhinolophus hipposideros*				
	n	min	max	M	SD	n	min	max	M	SD
LC	125	55.0	72.0	65.0	3.754	49	36.0	49.0	41.7	2.359
LCd	125	27.0	49.0	38.1	3.239	49	22.0	38.0	27.6	2.708
LAt	134	53.0	62.0	57.5	1.535	51	35.4	40.3	38.2	1.048
LA	125	20.6	27.5	23.7	1.156	48	14.4	17.5	16.3	0.764
G	103	10.0	29.0	20.0	2.877	44	3.5	7.0	4.9	0.822
LCr	59	22.70	24.82	23.78	0.418	45	15.25	16.76	16.14	0.302
LCc	89	19.88	21.76	20.67	0.339	57	13.28	14.14	13.71	0.192
LaZ	90	11.27	12.86	12.09	0.315	53	7.23	8.10	7.53	0.164
LaI	94	2.17	3.04	2.52	0.176	62	1.38	2.00	1.60	0.115
LaN	90	8.92	10.02	9.42	0.196	62	6.27	6.89	6.60	0.130
AN	89	6.19	7.43	6.90	0.267	58	4.33	4.93	4.65	0.117
CC	92	5.89	7.22	6.56	0.208	58	2.98	3.88	3.42	0.129
M^3M^3	93	7.95	9.02	8.63	0.212	62	4.93	5.64	5.37	0.120
CM^3	93	8.31	9.08	8.63	0.159	61	5.08	5.53	5.32	0.109
LMd	94	14.94	16.48	15.70	0.303	62	9.25	10.10	9.75	0.175
ACo	94	3.43	4.40	3.98	0.176	63	1.67	2.24	1.98	0.118
CM_3	94	8.72	9.73	9.26	0.188	62	5.17	5.72	5.47	0.127

Distributional status (Fig. 2). With 296 localities (Tab. 11), covering almost the whole Bulgarian territory, *R. ferrumequinum* is the most frequent and the most common bat species in Bulgaria. In this respect the situation is identical throughout the whole region of the southern Balkans (Kryštufek et al. 1992, Uhrin et al. 1996a, Benda & Horáček 1998, Hanák et al. 2001). In comparison to *R. hipposideros*, this species clearly predominates in lower altitudes (see Pandurska 1997a), particularly in the karstic regions rich in caves. The altitudinal span of the records is from the sea level up to highlands, most often from 100 to 500 m a. s. l. Nevertheless, the absolute span of elevations at which the two species have been recorded is identical, due to the fact that *R. ferrumequinum* was found regularly up to 1100 m a. s. l., exceptionally up to 1600 m a. s. l. According to Pandurska (1997a) the species evidently prefers to roost in underground spaces since 92% of records concern caves and mines, only 4% come from buildings.

Both nursery colonies (50–700 ind.) and hibernation aggregations (up to 600 ind. in one cave) occupy caves. The trend to use buildings (synanthropy), which has almost exclusivelly been observed in central Europe, is less expressed in Bulgaria. External and cranial dimensions of examined specimens of *R. ferrumequinum* from Bulgaria are shown in Tab. 2.

Rhinolophus hipposideros (Bechstein, 1800)

Records. **Original data**: B l a g o e v g r a d: General Todorov, Pčelina hill, gallery, summer 1995: net. 2 ind. (leg. J. Sádlová); – Golešovo, Stăršelica cave, 8 March 1990: obs. 7 ind.; – Gorna Breznica, small cave 1.5 km W of village, 15 July 1981: obs. 1 ind.; – Gorna Breznica, a drainage tube under a road, 24 July 1981: obs. colony of 11 ind. (coll. 2faL, NMP 50030, 50031 [S+A]); – Gorna Breznica, wooden cottage, 21 July 1981: net. colony of 12 ind. (7faL, 2mj, 3fj) (coll. 3fa, NMP 50027–50029 [S+A]), 24 July 1981: obs. colony of 13 ind. (1fa, 2mj), 15 July 1982: obs. colony 17 ind. (16fa); – Ilindenci, Šaralijskata Peštera cave, 4 Febr. 1995: obs. 20 ind., 15 Febr. 1998: obs. 50 ind., 19 Dec. 2002: obs. 23 ind.; – Kresna, Gara Stara Kresna, bunker above railway tunnel 13/14, 19 Dec. 2002: obs. 1 ind.; – Liljanovo, 9 July 1976: obs. colony, net. 1ma, 4faL+j (NMP 49368–49372 [S+A]); – Ploski, small cave, 22 Sept. 1990: obs. 2 ind., 8 April 1991: obs. 1 ind.; – Razlog, Meča Dupka cave, 30 August 1980: net. 24m, 16f, 1 ind. (coll. 5ma, 2fa, NMP 49997–50003 [S+A]); – Razlog, Propadnalata Peštera cave, 19 July 1982: net. 1ma; – Ribnovo, Manuilovata Peštera cave, 30 April 1994: coll. 3 subfossil ind.

(NMNHS); – Sandanski, gallery, 23 Sept. 1990: obs. 1 ind., 23 April 1991: obs. 2 ind.; – Vlahi, small cave, 16 Dec. 1990: obs. 1 ind. – B u r g a s: Brăšljan, building, 14 June 1995: coll. 1ma (NMNHS 027); – Černomorec, gallery n. town, 16 July 1987: net. 1m; – Dobromir, gallery in a hill, 30 July 1979: net. 1faL; – Kosti, over small river, 10 July 1998: obs.; – Kosti, Maharata cave, 8 Jan. 2000: obs. 1 ind.; – Malko Tărnovo, Bratanovskata Peštera cave, 5 Jan. 2000: obs. 10 ind.; – Malko Tărnovo, Goljamata Vitanovskata Peštera cave, 6 Jan. 2000: obs. 13 ind.; – Malko Tărnovo, Malkata Vitanovskata Peštera cave, 6 Jan. 2000: obs. 1 ind.; – Mladežko, Ezeroto cave, 1 May 1991: obs. 1 ind., 3 Jan. 2000: obs. 4 ind.; – Mladežko, Kaleto cave, 3 Jan. 2000: obs. 2 ind.; – Mladežko, Lejarnicite cave, 3 Jan. 2000: obs. 1 ind.; – Mladežko, tree hollow, 26 April 1990: obs. 1ma; – Primorsko, Maslen Nos cape, Karaul Taš, rocks, 16 July 1998: obs. 3 ind.; – Ropotamo river estuary, 6 June 1957: coll. 1fa (NMP 49347 [S+B]; leg. M. Josifov, cf. Hanák & Josifov 1959); – Zvezdec, Goljamata Văpa cave, Petrova Niva, 4 Jan. 2000: obs. 59 ind.; – Zvezdec, small cave, 26 August 1999: obs. 1 ind. – D o b r i č: Kamen Brjag, Jajlata, small caves, 10 April 1994: obs. 5 ind.; – Sveti Nikola, Bolata, small cave, 7 April 1994: obs. 2fa. – G a b r o v o: Drjanovo, Bačo Kiro cave, 15 April 1996: obs. 2 ind., 22 Jan. 1998: obs. 10 ind., 31 Jan. 1998: obs. 25 ind. – H a s k o v o: Bjal Kladenec, Goljamata Peštera cave, 5 May 1996: obs. 1ma; – Bjal Kladenec, Karadžainler cave, 10 Oct. 1998: obs. 1 ind.; – Bjal Kladenec, Malkata Peštera cave, 5 May 1996: obs. 1ma; – Dăbovec, Arda, cavern on riverside, 3 July 1983: obs. 1 ind.; – Dolno Čerkovište, Zandana cave, 21 April 1996: obs. 1 ind. (cf. Ivanova 1997), 8 Febr. 1998: obs. 6 ind.; – Dolno Čerkovište, small cave, 30 Sept. 2003: net. 1m (leg. R. Lučan); – Lozen, gallery, 12 April 1998: obs. 1 ind.; – Madžarovo, building, 5 June 1996: obs. 4 ind., 14 June 1996: obs. nurs. colony of 6 ind., 18 July 1996: obs. nurs. colony of 6 ind., 13 July 1997: obs. nurs. colony of ca. 5 ind., 17 June 1998: obs. nurs. colony of 5 ind., 7 June 1999: obs. nurs. colony of 10 ind., 2 July 1999: obs. nurs. colony of 14 ind., 25 July 1999: obs. nurs. colony of 15 ind.; – Madžarovo, gallery, 11 Febr. 1996: obs. 1 ind., 12 Febr. 1996: obs. 5 ind., 20 April 1996: obs. 2 ind., 13 April 1998: net. 1fa, 28 Oct. 2002: obs. 8 ind. (leg. R. Lučan), 28–30 Sept. 2003: net. 2ma, obs. 5 ind. (leg. R. Lučan); – Svetoslav, niche near small stream, 3 March 1999: obs. 2 ind. – J a m b o l: Lesovo, galleries, 20 Nov. 1997: obs. 11 ind.; – Melnica, Kesedžiica cave, 25 Nov. 1997: obs. 10 ind.; – Melnica, Suhata Drănči Dupka cave, 21 Nov. 1997: obs. 4 ind.; – Ustrem, small cave, 23 Febr. 1997: obs. 10 ind. – K ă r d ž a l i: Beli Dol, caves, 24 April 1995: obs. 1 ind.; – Belopoljane, Belopoljanskata Peštera cave, 23 April 1996: obs. 1 ind.; – Bjal Izvor, Džin Gugu cave, 12 Febr. 1998: obs. 1 ind.; – Bjala Poljana, Manaf-Kojusju cave, 8 Febr. 1998: obs. 8 ind.; – Huhla, Ivajlovgrad dam, power station, 5 July 1995: obs. nurs. colony of ca. 20 ind., 21 Sept. 1996: obs. 10 ind., building, 21 Sept. 1996: obs. 1 ind.; – Ivajlovgrad, Dupkata cave, 5 April 1992: obs. 1 ind.; – Kobiljane, Vodnata Peštera cave, 12 Febr. 1998: obs. 7 ind.; – Kremen, cave, 20 July 1996: obs. 1 ind.; – Meden Buk, Žălti Čal, abandoned house, 10 June 1996: obs. 4 ind.; – Orešari, Gouk-In cave, 27 April 1996: obs. 1ma, 8 Febr. 1998: obs. 2 ind; – Ribino, Aina Ini cave, 9 Febr. 1998: obs. 1 ind., 4 March 1999: obs. 3 ind.; – Ribino, Brăšljanovata cave, 22 Oct. 1995: obs. 1 ind. (cf. Ivanova 1997), 2 Jan. 1997: obs. 3 ind. (cf. Ivanova 1997), 18 Nov. 1997: obs. 2 ind. (cf. Ivanova 1997), 30 Dec. 1999: obs. 1 ind.; – Ribino, Kondžalar cave, 7 July 1995: obs. nurs. colony of 5 ind. (cf. Ivanova 1997); – Ribino, Samara cave, 1 April 1995: obs. 3 ind. (cf. Ivanova 1997), 20 April 1995: obs. 1 ind. (cf. Ivanova 1997), 1 May 1996: obs. 1 ind. (cf. Ivanova 1997), 2 Jan. 1997: obs. 1 ind. (cf. Ivanova 1997), 18 Nov. 1997: obs. 4 ind. (cf. Ivanova 1997), 9 Febr. 1998: obs. 15 ind., 18 May 1998: obs. 2 ind., 11 Oct. 1998: obs. 1 ind., 4 March 1999: obs. 4 ind., 30 Dec. 1999: obs. 3 ind.; – Studen Kladenec, tunnel inside a dam wall, 4 May 1996: obs. 30 ind.; – Tărnovci, small cave, 26 April 1996: obs. 2 ind.; – Tatul, small cave, 3 Febr. 1989: obs. 1ma, 1 ind.; – Visoka Poljana, Jarasă-Ini cave, 31 March 1992: obs. 1 ind., 5 Jan. 1997: obs. 3 ind., 14 March 2000: ind. 1 ind. – K j u s t e n d i l: Rilski Manastir, Iliina Reka river, building, 1420 m a. s. l., 28 June 2001: obs. (leg. N. Simov), gallery, 1550 m a. s. l., 24 August 2001: obs. 9 ind. (leg. N. Simov); – Rilski Manastir, Kirilova Poljana, gallery, 18 Dec. 2002: obs. 6 ind.; – Rilski Manastir, Kirilova Poljana, tunnel, 18 Dec. 2002: obs. 5 ind.; – Rilski Manastir, Kravarski Dol, Iliina Reka river, gallery, 19 Dec. 2002: obs. 3 ind.; – Rilski Manastir, gallery, 19 Oct. 1997: obs. 3 ind. (cf. Beron et al. 2001b); – Trekljano, Jamkata cave, 3 June 1995: net. 3ma, 13 March 1999: obs. 10 ind. – L o v e č: Aprilci, Pleven hut, building, 23 May 1999: obs. 1ma; – Bežanovo, Parnicite cave, 16 April 1994: obs. 1 ind., 20 Jan. 1996: obs. 10 ind., 13 Jan. 2002: obs. 10 ind.; – Brestnica, Săeva Dupka cave, 8 Febr. 1965: coll. 1ma, 1ms, 1fa, 2fs (NMP 50091–50095 [S+B]), 1 May 1999: net. 3ma, 1fa; – Čavdarci, Mandrata cave, 12 Jan. 2002: obs. 3 ind.; – Černi Osăm, Smesite, galleries, 2 Nov. 1997: obs. 17 ind. (leg. P. Beron & V. Beškov, cf. Ivanova 1998, Beron et al. 2000a); – Čiflik, Hajduška Pesen hut, gallery, 2 Nov. 1997: obs. 1 ind. (leg. P. Beron & V. Beškov, cf. Ivanova 1998, Beron et al. 2000a); – Devetaki, Devetaškata Peštera cave, 19 Jan. 2000: obs. 2 ind., 12 Jan. 2002: obs. 3 ind.; – Divčovoto, Boroveška Dupka cave, 29 Sept. 1997: obs. 1 ind. (cf. Ivanova 1998, Beron et al. 2000a); – Divčovoto, Graždenica cave, 28 Sept. 1997: obs. 1 ind. (cf. Ivanova 1998, Beron et al. 2000a), 1 Nov. 1997: obs. 1 ind. (leg. P. Beron & V. Beškov, cf. Ivanova 1998); – Dragana, Skoka cave, 29 Jan. 1998: obs. 6 ind., 4 Dec. 1999: obs. 8 ind.; – Gložene, Ljastovicata cave, 20 April 1968: obs. (leg. P. Beron), 26 Dec. 1994: obs. 10 ind., 21 Febr. 1998: obs. 32 ind.; – Gložene, Morovica cave, 18 April 1993: obs. 1 ind., 1 May 1994: net. 1ma, 25 Febr. 1998: obs. 2 ind.; – Goljama Željazna, Toplja cave,

26 April 1991: obs. 2 ind., 2 Febr. 1997: obs. 1 ind., 4 June 2000: obs. 1ind.; – Karlukovo, cave behind monastery, 8 August 1978: net. 1ma (NMP 49758 [S+A]), 9 August 1978: net. 1ma (NMP 49777 [S+A]); – Karlukovo, monastery, 14 July 1976: obs. 2ms; – Karlukovo, ridge above rocky amphitheatre, 5 July 1976: net. 1fa (NMP 49354 [S+A]); – Karlukovo, Bankovica cave, 7 Febr. 1965: coll. 1ms (NMP 50080 [S+B]); – Karlukovo, Bezimenna 22 cave, Zadanen Dol, 17 Jan. 1993: obs. 1fa; – Karlukovo, Mandrata cave, 26 Nov. 1994: obs. 1 ind.; – Karlukovo, Temnata Dupka cave, 7 August 1978: net. 1ma (NMP 49753 [S+A]); – Karlukovo, Zadănenka cave, Zadănen Dol, 10 April 1993: obs. 2fa; – Krušuna, Uruška Maara cave, 21 May 1994: obs. 1 ind.; – Mikre, Goljamata Mikrenska Peštera cave, 29 Jan. 1997: obs. 1 ind.; – Trojan, Zmejova Dupka cave, Hitrovci, 18 Nov. 1923: coll. 2ma (NMNHS; leg. I. Bureš). – M o n t a n a: Gorna Bela Rečka, gallery, 26 Oct. 1997: net. 7 ind. (leg. R. Pandurska, cf. Pandurska & Beshkov 1998a), 14 April 1998: obs. 47 ind.; – Gorna Luka, Mišin Kamăk cave, 19 July 2000: obs. 2 ind.; – Gorna Luka, Suhi Peč cave, 19 July 2000: obs. 1 ind.; – Gorna Luka, Vodni Peč cave, 25 Febr. 2000: obs. 4 ind.; – Prevala, Vreloto cave, 27 Febr. 2000: obs. 2 ind. – P a z a r d ž i k: Gabrovica, Golaškata Peštera mine, 17 Dec. 1994: obs. 1 ind., 23 Jan. 1997: obs. 1 ind., 23 Jan. 1998: obs. 2 ind., 11 Dec. 1998: obs. 2 ind., 27 Jan. 2002: obs. 1 ind.; – Peštera, Lilova Skala cave, 5 Febr. 1965: coll. 1fs (IVB 398 [S+B]); – Peštera, Novata Peštera cave, 4 Febr. 1965: coll. 1ma (NMP 50072 [S+B]), 11 July 1981: net. 1 ind., 31 Nov. 1991: obs. 10 ind., 8 Dec. 1997: obs. 10 ind. (leg. S. Tanev); – Peštera, Snežanka cave, 5 Febr. 1965: coll. 1ma (NMP 50076 [S+B]), 23 Nov. 1991: obs. 1 ind., 1 March 1992: obs. 30 ind.; – Peštera, Vodnata Peštera cave, 30 Nov. 1991: obs. 10 ind., 2 March 1992: obs. 5 ind.; – Velingrad, Lepenica cave, 9 July 1981: net. 1 ind. – P e r n i k: Rajanci, Jamkite cave, 29 Oct. 1966: coll. 1ma (NMNHS; leg. P. Beron), 14 March 1999: obs. 1 ind. – P l e v e n: Muselievo, abandoned building, 31 May 2001: obs. 2 ind.; – Muselievo, cave, 30 May 2001: obs. 1 ind.; – Muselievo, niche in rocks, 9 June 2001: net. 1ma; – Pleven, library building, 3 April 1995: obs. 5 ind.; – Rakita, Sedlarkata cave, 22 March 1997: obs. 2 ind., 29 Jan. 1998: obs. 1 ind., 4 Dec. 1999: obs. 3 ind.; – Sadovec, Gininata Peštera cave, 8 Jan. 1988: obs. 1 ind. – P l o v d i v: Bačkovo, Bačkovski monastery, 14 July 1976: coll. 2ms (NMP 49434, 49435 [S+A]); – Bačkovo, small cave, 30 July 1979: coll. 1faL (NMP 49807 [S+A]); – Dobrostan, Ahmet'ova Dupka cave, 28 Dec. 1999: obs. 6 ind.; – Dobrostan, Topčika cave, 19 Febr. 1997: obs. 4 ind.; – Hristo Danovo, Damla Dere, gallery, 4 Nov. 1997: obs. 34 ind. (leg. P. Beron & V. Beškov, cf. Ivanova 1998), 2 Dec. 1997: obs. 46 ind. (cf. Ivanova 1998, Beron et al. 2000a); – Hristo Danovo, Zlatnata Peštera cave, 27 Sept. 1997: obs. 1 ind. (cf. Ivanova 1998, Beron et al. 2000a); – Kărnare, Mazata cave, 25 Sept. 1997: obs. 1m (cf. Ivanova 1998), 3 Nov. 1997: obs. 8 ind. (leg. P. Beron & V. Beškov, cf. Ivanova 1998, Beron et al. 2000a); – Kričim, building, 10 June 1917: coll. 1fa (NMNHS; leg. I. Bureš), 10 April 1939: coll. 1fa (NMNHS 188; leg. I. Bureš); – Mostovo, Gargina Dupka cave, 21 Febr. 1997: obs. 3 ind., 7 Febr. 1998: obs. 1 ind., 21 May 1998: obs. 2 ind.; – Mostovo, Zmiin Borun cave, 21 Febr. 1997: obs. 2 ind. – R a z g r a d: Krivnja, Božkova Dupka cave, 22 Jan. 2000: obs. 10 ind. – R u s e: Krasen, Găbarnika cave, 30 June 1996: obs. 1 ind.; – Nisovo, small cave, 8 April 1991: obs. 3 ind.; – Pepelina, Orlova Čuka cave, 12 Jan. 1991: obs. 10 ind., 31 Jan. 1998: obs. 3 ind., 21 Jan. 2000: obs. 10 ind.; – Pisanec, cave, 17 Jan. 1989: obs. 1 ind., 7 Oct. 1989: obs. (leg. I. Mitev), 19 Nov. 1989: obs. (leg. I. Mitev), 24 Dec. 1989: obs. (leg. I. Mitev). – S i l i s t r a: Balik, Sandăk Peštera cave, 19 April 1999: obs. 1 ind.; – Balik, cave No. 410, 19 April 1999: obs. 1 ind.; – Vojnovo, Malkata Badžalija cave, 16 April 1999: obs. 3 ind. – S l i v e n: Kotel, Lednicata cave, Zlosten, 26 Febr. 1997: obs. 15 ind.; – Kotel, small cave 4 km W of the town, 15 July 1979: obs. 1 ind.; – Kotel, cottage 1 km W of town, loft, 15 July 1979: obs. colony of 15 ind. (5ma, 3fa, 3j) (coll. 5ma, NMP 49793–49797 [S+A]); – Sliven, galleries, 12 August 1983: net. 1ms; – Sliven, Zmejovi Dupki cave, 12 August 1983: net. 1fs; – Tvărdica, Măglivijat Snjag cave, 26 Sept. 1996: net. 2 ind. (cf. Ivanova 1998). – S m o l j a n: Borikovo, Borikovskata cave, 1 Jan. 2003: obs. 3 ind.; – Čepelare, loft of a church tower, 13 July 1976: coll. 1ms (NMP 49433 [S+A]); – Jagodina, Dolna Karanska Dupka cave, 16 August 1978: net. 1ma (NMP 49789 [S+A]); – Jagodina, Gorna Karanska Dupka cave, 16 August 1978: net. 1ma (NMP 49788 [S+A]); – Jagodina, Imamova Dupka (= Jagodinska Peštera) cave, 15 August 1978: net. 5ma, 1fs (NMP 49780–49784, 49786 [S+A]), 26 Oct. 2002: net. 3ma, 2fa (leg. R. Lučan); – Jagodina, Sančova Dupka cave, 1020 m a. s. l., 13 August 1971: coll. 1 recent skeleton (cf. Horáček et al. 1971, 1974); – Mogilica, Uhlovica cave, 31 Dec. 2002: obs. 26 ind.; – Nadarci, Nadarci cave, 31 Dec. 2002: obs. 5 ind.; – Tešel, Drangaleška Propast chasm, 29 Dec. 1993: obs. 3 ind.; – Trigrad, Raž 3 cave, 13 Febr. 1998: obs. 3 ind. – S o f i j a: Bărlja, Dedovo Pole, Šamaka cave, 21 Oct. 1990: obs. 75 ind.; – Beledie Han, Komina cave, 26 Febr. 1995: obs. 1ma; – Berende Izvor, Temnata Dupka cave, 2 March 1991: obs. 4 ind., 4 Febr. 2001: obs. ca. 30 ind. (leg. G. Stojanov); – Boženica, Razdolci, house, 4 August 1994: obs. 15 ind.; – Bov, Mečata Dupka cave, 31 Jan. 1994: obs. 8 ind.; – Drenovo, Goljamata Temnota cave, 30 Oct. 1994: obs. 1ma; – Ginci, Dinevata cave, 11 Sept. 1979: obs. 1ma (leg. V. Vasilev), 22 Sept. 1991: net. 2ma, 1fa (cf. Pandurska et al. 1999), 18 April 1992: obs. 1 ind., 19 June 1992: net. 1ma, 18 April 1993: net. 1fa, 11 Oct. 1997: obs. 2 ind., 18 Jan. 1998: obs. 34 ind.; – Ginci, Petrohan Prohod pass, building, 15 March 1998: obs. 15 ind. (leg. G. Stojanov); – Ginci, Seglaroto cave (Bilin Dol), 13 Dec. 1998: obs. ca. 100 ind.; – Ginci, Tošova Dupka cave (Zaskogo), 17 Febr. 1968: coll. 1 ind. (NMNHS; leg. P. Beron); – Golema Rakovica, 7 April 1952: 4ma (ZIN; leg. J. Gorelov); – Iskrec, Pešta cave,

3 Jan. 1925: coll. 1ma (NMNHS; leg. I. Bureš); – Kokaljane, Urvič, gallery, 18 Nov. 1962: coll. 1ma (NMNHS; leg. P. Beron), 8 April 1971: coll. 3ma, 1fa (NMNHS; leg. V. Beškov), 18 Febr. 1991: obs. 1 ind.; – Lakatnik, Rážiškata (= Suhata) Peštera cave, 16 Dec. 2002: obs. 6 ind.; – Lakatnik, Svinskata Dupka cave, 19 March 1956: coll. 2ma (NMP 50136, 50137 [S+B]), 21 Dec. 1979: obs. 2ma (leg. V. Vasilev), 16 Dec. 2002: obs. 12 ind.; – Lakatnik, Temnata Dupka cave, 23 March 1930: coll. 1ma (NMNHS 189; leg. I. Bureš), 3 Jan. 1962: coll. 1 ind. (NMP 49813 [S+B]; leg. J. Sklenář), 23 Nov. 1995: obs. 10 ind. (leg. N. Kodžabašev), 16 Dec. 2002: obs. 5 ind.; – Lakatnik, small cave n. the Temnata Dupka cave, 16 Dec. 2002: obs. 6 ind. – Š u m e n: Divdjadovo, Zandana cave (Divdjadovski), winter 1999/2000: several ind. (cf. Ivanova 2001); – Šumen, Zandana cave, 29 Sept. 1996: obs. ca. 20 ind. (cf. Ivanova 2001), 23 Jan. 2000: obs. 50 ind. (cf. Ivanova 2001). – V a r n a: Varna, Evksinograd, 15 Oct. 1928: coll. 2ma (NMNHS 032-4; leg. I. Bureš), 3 August 1935: coll. 1fj (NMNHS 032-7; leg. I. Bureš). – V e l i k o T ă r n o v o: Beljakovec, Goljamata Podlisca cave, 14 April 1996: obs. 1fa; – Emen, Emenskata Peštera cave, 21 Feb. 1998: obs. 5 ind., 19 April 2000: obs. 1 ind.; – Emen, Troana cave, 14 April 1996: obs. 5 ind. – V i d i n: Gorni Lom, Desni Suhi Peč cave, 25 Febr. 2000: obs. 20 ind., 19 July 2000: obs. 5 ind.; – Gorni Lom, Levi Suhi Peč cave, 25 July 2000: obs. 25 ind., 19 July 2000: obs. 3 ind.; – Kračimir, Kračimirsko Vrelo, 26 Febr. 2000: obs. 2 ind.; – Orešec, Bašoviški Peč cave, 26 Febr. 2000: obs. 1 ind.; – Orešec, Peč cave (Suhi Peč), 26 Febr. 2000: obs. 3ind. – V r a c a: Beli Izvor, Kalna Mătnica cave (Toškova Dupka), 17 Febr. 1968: coll. 1ma (NMNHS; leg. P. Beron), 12 June 1994: obs. 3ma, 11 Dec. 1999: obs. 4 ind.; – Botunja, cave No. 277, 11 June 1994: obs. 1 ind.; – Čiren, Ponora cave, 27 Jan. 1998: obs. 1 ind.; – Drašan, Drašanskata Peštera cave, 6 Dec. 1997: obs. 6 ind.; – Kalen, Kalenskata Peštera cave, 8 March 1998: obs. 2 ind., 12 Dec. 1999: obs. 2 ind.; – Kunino, 1 May 1993: obs. 2fa; – Kunino, Čeloveča Dupka cave (Čeloveči Dol), 1 May 1993: obs. 2fa, 26 Nov. 1994: obs. 2 ind., 9 Nov. 1998: obs. 5 ind., 11 Dec. 1999: obs. 1 ind., 22 April 2000: obs. 1 ind.; – Kunino, small cave No. 4281, 1 May 1993: obs. 2fa; – Kunino, Gornata Peštera cave (Čeloveči Dol), 9 Nov. 1998: obs. 2 ind.; – Zgorigrad, Părševiška Jama cave, 28 Febr. 1999: obs. 10 ind. – **Published data**: B l a g o e v g r a d: Golešovo, Stăršelica cave, 29 Nov. 1992 (Beron 1994); – Gospodinci, Bekir-Salăhovata Dupka cave, 27 May 1960 (Beron & Guéorguiev 1967); – Osikovo, Manajlovata Peštera cave [= Ribnovo, Manuilovata Peštera], 14 May 1959 (Beron 1962); – Petrič, 23 April 1957 [NMNHS] (Hanák & Josifov 1959); – Razlog, Propadnaloto cave, 20 Oct. 1963 (Beron & Guéorguiev 1967). – B u r g a s: Gramatikovo, Kačulskata Propast chasm, 8 Dec. 1963 (Kolebinova & Beron 1965, cf. Kolebinova 1968); – Mladežko, Ezeroto cave, 2 April 1971 (Beron 1972). – D o b r i č: Dobrudža, undefined (Markov & Hristov 1960); – Sveti Nikola, Tauk Liman, Karankut maara cave, 11 August 1999: 1400 ind. (Stoev et al. 2002). – G a b r o v o: Drenovo, Golema Vodna Peštera cave, 21–24 May 1924: many ind. (Bureš 1926). – K ă r d ž a l i: Ivajlovgrad, Dupkata cave, 22 March 1975: 2m, 1f (Nowosad et al. 1987); – Ostrovica, Tilkiini cave, 15 July 1962 (Beron & Guéorguiev 1967), 16 Dec. 1962 (Jančev & Stojkova 1973). – K j u s t e n d i l: Paničište, Bezimenna cave, 1200 m a. s. l. (Beron et al. 2000b); – Pastra, Elešnica river valley, gallery, 880 m a. s. l. (Beron et al. 2000b); – Rilski Manastir, Kirilova Poljana, gallery, 1500 m a. s. l. (Beron et al. 2000b); – Stradalovo, Meča Dupka cave, 27 Febr. 1969 (Beron 1973a); – Trekljano, Jamkata cave, 29 Oct. 1966 (Beron 1973b). – L o v e č: Brestnica, Săeva Dupka cave, 3 March 1958: 10 ind. 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(Beškov 1993, Beshkov 1998), 1991–1998 (Pandurska & Beshkov 1998a); – Gorna Luka, Peč cave, 1991–1998 (Pandurska & Beshkov 1998a); – Gorna Luka, Živkova Dupka cave, 30 Jan. 1961 (Beron 1962); – Gorna Verenica, Dupkata cave, 4 Febr. 1967 (Beron 1970, Jančev & Stojkova 1973); – Gorno Cerovene, Kamăko cave, 15 August 1960 (Beron 1962); – Prevala, Levica Vreloto cave, 1 Febr. 1961 (Beron 1962); – Văršec, 12 August 1977: 1f (Skuratowicz et al. 1982). – P a z a r d ž i k: Belovo, Pešterata cave, 16 May 1959 (Beron 1962); – Gabrovica, Golak, Golaškata Peštera mine, 8 Nov. 1940: 10 ind. (Bureš 1941), 31 March 1958: 1 ind. (Beškov 1962), several hibernating ind. (Beškov 1993); – Peštera, Jubilejna cave, 7 March 1992: 2 ind. (Pandurska & Beshkov 1998b); – Peštera, Novata Peštera cave, 80–100 ind. (Atanasov 1936a, cf. Atanasov 1942), 5 ind. (Pandurska & Beshkov 1998b); – Peštera, Snežanka cave, 3 Jan. 1961 (Markov & Džambazov 1962), 8 ind. (Pandurska & Beshkov 1998b); – Velingrad, Lepenica cave, 24 Dec. 1960 (Beron 1962), 17 Dec. 1961: 1 ind. (Beškov & Beron 1962), 6 Oct. 1994: 3 ind. (Pandurska & Beshkov 1998b). – P e r n i k: Bosna [= Bosnek], Duhlata cave, 19 Oct. 1935: coll. 1fa [NMNHS 032-9] (Hanák & Josifov 1959), 3 ind. (Beron 1958); – [Bosnek], Popov Izvor cave, 26 Nov. 1993 (Pandurska & Beshkov 1998b); – Filipovci,

Filipovskata Peštera cave, 27 Febr. 1967 [1ma, NMNHS] (Beron 1968); – Kožinci, Mečata Dupka cave, 6 Nov. 1969 (Jančev & Stojkova 1973); – Krapec, Živata cave, 26 Dec. 1993 (Pandurska & Beshkov 1998b); – Studena, gallery, 26 Dec. 1993 (Pandurska & Beshkov 1998b), 8 Febr. 1994 (Pandurska & Beshkov 1998b). – P l e v e n: Bohot, Kirov Vărtop chasm, winter visit: several ind. (Beškov 1993, Beshkov 1998); – Devenci, Hajduškata Peštera cave, 27 Sept. 1959 (Beron 1962), April 1989: 1 ind. (Beshkov 1998); – Pleven [Kajlăka park], Golemata Peštera [= Kajlăškata Peštera] cave, 12 Oct. 1914: obs. several ind. (Bureš 1917, Kovačev 1925); – Sadovec, Gininata Peštera cave, Dec. 1988: 1 ind. (Beshkov 1998). – P l o v d i v: Dobrostan, Ovčata Peštera cave, 21 April 1960 (Beron 1962). – R u s e: Božičen, 1 ind. (from owl pellets) (Mitev 1995); – Novo Selo, small caves, 31 March 1968: 2 ind. (Undžijan 1998); – Pisanec, 2 ind. (from owl pellets) (Mitev 1995); – Ruse, Sv. Petka cave (Kovačev 1906); – Ruse, gallery near the Lom river estuary, 28 Nov. 1962: 1 ind. (Undžijan 1998). – S l i v e n: Kotel, surroundigs, 1958–1961: 3 ind. (Bădvarov 1963); – Kotel, Drjanovskata Peštera cave, 9 April 1960 (Beron 1962); – Kotel, Ledenika cave, 10 April 1960 (Beron 1962); – Medven, Maarata cave, 14 April 1960: 1 ind. (Nowosad et al. 1987). – S m o l j a n: Borovo, Borovskata Dupka cave, 19 March 1968 [2fa, NMNHS] (Jančev & Stojkova 1973, Beron 1974b); – Jagodina, Gorna Karanska cave, 23 Nov. 1993: 6 ind. (Pandurska & Beshkov 1998b); – Jagodina, Jagodinska cave, 23 Nov. 1993: 8 ind. (Pandurska & Beshkov 1998b); – Jagodina, Karnata cave, 23 Nov. 1993: 2 ind. (Pandurska & Beshkov 1998b); – Jagodina, Sančova Dupka cave, 23 Nov. 1993: 15 ind. 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Petkov] (Bureš 1917, Kovačev 1925), Dušnika cave, 1991–1998 (Pandurska & Beshkov 1998a); – Kalotina, Temnata Dupka cave, 12 March 1961 (Beron & Guéorguiev 1967); – Komštica, Balabanova Dupka cave, 27 April 1966 (Beron & Guéorguiev 1967), 1991–1998 (Pandurska & Beshkov 1998a); – Kokaljane, Urvič, galleries, 1m, 3f (Hanák & Josifov 1959), colony of 25–30 ind. (Kvartirnikov 1956, Beron 1958), 9 March 1957: 1m, 2 ind. (Beron 1963), 31 March 1957: 2m, 2 ind. (Beron 1963), 6 April 1957: 1m (Beron 1963), 27 April 1957: 1f (Beron 1963), 18 May 1957: 1m, 1f (Beron 1963), 27 July 1957: 3m, 2 ind. (Beron 1963), 19–20 Oct. 1957: 7m, 2f (Beron 1963), 3 Nov. 1957: 2m (Beron 1963), 8–9 Nov. 1957: 2m (Beron 1963), 13 Nov. 1957: 1m (Beron 1963), 23 Nov. 1957: 3m, 1f, 2 ind. (Beron 1963), 7 Dec. 1957: 6m, 1f (Beron 1963), 13 Dec. 1957: 1 ind. (Beron 1963), 17–18 Jan. 1958: 2m, 1f, 2 ind. (Beron 1963), 8 Febr. 1958: 2m, 1f, 1 ind. (Beron 1963), 6 April 1958: 2m (Beron 1963), 12 April 1958: 4m (Beron 1963), 24 June 1958: 1f, 1 ind. (Beron 1963), 6 Sept. 1958: 1m, 6f (Beron 1963), 23 Oct. 1958: 1f (Beron 1963), 29 Oct. 1958: 2m (Beron 1963), 16 Nov. 1958: 2m, 1f (Beron 1963), 14 Dec. 1958: 1m (Beron 1963), 1 March 1959: 2m (Beron 1963), 8 March 1959: 4m (Beron 1963), 22 March 1959: 1m (Beron 1963), 5 April 1959: 2m, 2f, 1 ind. (Beron 1963), 5 May 1959: 1m, 4f (Beron 1963), 27 May 1959: 1f (Beron 1963), 12 June 1959: 1m (Beron 1963), 28 June 1959: 1f (Beron 1963), 1 Oct. 1959: 2m (Beron 1963), 24 Oct. 1959: 3m, 1f (Beron 1963), 1 Nov. 1959: 1f (Beron 1963), 29 Nov. 1959: 1m (Beron 1963), 17 Jan. 1960: 4m, 1f (Beron 1963), 19 March 1960: 1m (Beron 1963), 13 May 1960: 1m, 1f (Beron 1963), 24 Jan. 1961: 1f (Beron 1963), 10 May 1961 (Jančev & Stojkova 1973), 14 Nov. 1961 (Jančev & Stojkova 1973), 4 Febr. 1963 (Jančev & Stojkova 1973), 6 April 1964 (Kolebinova & Beron 1965), 19 March 1967 (Jančev & Stojkova 1973), 28 May 1967 (Jančev & Stojkova 1973), 8 April 1971 (Beron 1973a, 1974b); – Kokaljane, rocky fissure, 31 May 1961 (Jančev & Stojkova 1973); – Kostenec, gallery, 7 May 1966 (Beron 1968); – Kostenec, Čavča river valley, gallery, 780 m a. s. l. (Beron et al. 2000b); – Lakatnik, cave, 23 March 1930 [NMNHS] (Hanák & Josifov 1959), 10 March 1951: 1m [NMNHS] (Hanák & Josifov 1959), 24 Jan. 1955 [NMNHS] (Hanák & Josifov 1959), 21 May 1961 (Jančev & Stojkova 1973), 28 Nov. 1966 (Jančev & Stojkova 1973); – Lakatnik, Goljamata Vraža Dupka cave, 9 Nov. 1958 (Beron 1962), 1991–1998 (Pandurska & Beshkov 1998a); – Lakatnik, Javorecka cave, 1991–1998 (Pandurska & Beshkov 1998a); – Lakatnik, Kozarskata Peštera cave, 6 Jan. 1956 (Beron 1962); – Lakatnik, Probojnica river, caves (Kvartirnikov 1956), 1991–1998 (Pandur-

ska & Beshkov 1998a); – Lakatnik, Răžiška Peštera cave, 31 Dec. 1957 (Beron 1962), 25 Nov. 1966 (Beron 1968), 1991–1998 (Pandurska & Beshkov 1998a); – Lakatnik, Svinskata Dupka cave, 24 Jan. 1955 (Beron 1962), 6 Jan. 1957: 1 ind. (Beron 1963), 1 Jan. 1958: 1 ind. (Beron 1963), 31 Jan. 1958: 1 ind. (Beron 1963), 16 Febr. 1958: 1 ind. (Beron 1963), 5 Nov. 1961: 1m (Beron 1963), 4 March 1962: 1m (Beron 1963), 25 Nov. 1966 (Beron 1968, 1970), 1991–1998 (Pandurska & Beshkov 1998a); – Lakatnik, Temnata Dupka cave, 29 Jan. 1956 (Beron 1962); – Lakatnik, Židanka cave, 7 June 1955 (Beron 1962); – Lipnica, Boženiški Urvič, 1991–1998 (Pandurska & Beshkov 1998a); – Lipnica, Kozarnica cave, 1991–1998 (Pandurska & Beshkov 1998a); – Raduil, pseudokarstic caves, 1200 m a. s. l. (Beron et al. 2000b); – Svoge, gallery, 16 March 1958: 1 ind. (Beron 1958); – Želen, Izvornata Peštera cave, 20 April 1958 (Beron 1962); – Zimevica, Elata cave, 4 Dec. 1960 (Beron 1962), 1991–1998 (Pandurska & Beshkov 1998a); – Zimevica, Kacite cave, 11 Dec. 1960 (Beron & Guéorguiev 1967). – S t a r a Z a g o r a: Ostra Mogila, Labirinta cave, 2 Nov. 1994 (Beron 1994); – Zmejovo, Zmejova Dupka cave, 8 August 1960 (Beron 1962). – V a r n a: Varna, Evksinograd, 7 Oct. 1926, 3 August 1955 [NMNHS] (Hanák & Josifov 1959). – V i d i n: Dolni Lom, Desni Suhi Peč cave, 2 Febr. 1961 (Beron 1962), 1991–1998 (Pandurska & Beshkov 1998a); – Dolni Lom, Levi Suhi Peč cave, 2 Febr. 1961: 2 ind. (Beron 1962, Beškov & Beron 1962), 1991–1998 (Pandurska & Beshkov 1998a); – Dolni Lom, Vodni Peč cave, 2 Febr. 1961 (Beron 1962); – Kračimir, Zmijskata Propast chasm, 28 Oct. 1971 (Beron 1972); – Orešec, Suhi Peč cave, 25 Dec. 1969 (Jančev & Stojkova 1973), 1991–1998 (Pandurska & Beshkov 1998a); – Rabiša, Magura cave, 1 May 1957 (Beron 1962); – Repljana, Medžak Dupka cave, 25 Oct. 1971 (Beron 1972); – Repljana, Tatarska Dupka cave, 25 Oct. 1971 (Beron 1972); – Repljana, Zemna Dupka cave, 26 Oct. 1971 (Beron 1972); – Tărgovište, Temnata Dupka cave, 1991–1998 (Pandurska & Beshkov 1998a). – V r a c a: Bistrec, Zmejova Dupka cave, 30 Oct. 1960 (Beron 1962); – Čiren, Ponora cave, 23 Oct. 1960 (Beron 1962); – Dolna Bešovica, Dupna Mogila cave, 7 Febr. 1964 (Kolebinova & Beron 1965, Beron 1968, cf. Kolebinova 1968); – Glavaci, Kalna Mătnica cave, 24 April 1997: several ind. (Pandurska 2003), 1991–1998 (Pandurska & Beshkov 1998a); – Kalen, Kalenska Pešt cave, March 1988: 1 ind. (Beškov 1993, Beshkov 1998), March 1989: 6 ind. (Beškov 1993, Beshkov 1998); – Liljače, Božija Most cave, 1m (Grimmberger 1993); – Ljutadžik, Sokolskata Dupka cave, 5 Febr. 1967 (Jančev 1970, Jančev & Stojkova 1973), 1991–1998 (Pandurska & Beshkov 1998a); – Ljutibrod, Gara Čerepiš, Serapionovata Peštera cave, 18 March

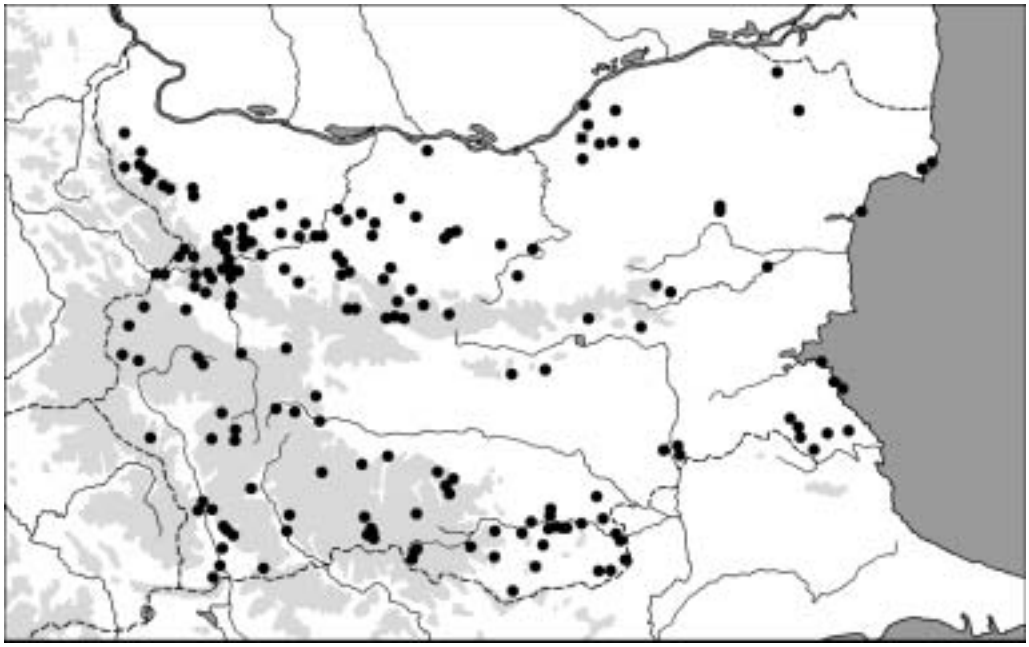

Fig. 3. Records of *Rhinolophus hipposideros* (Bechstein, 1800) in Bulgaria. Squares, osteological finds; circles, all other records.

1963 (Jančev 1970, Jančev & Stojkova 1973), summer visits: several ind. (Beškov 1993). – Bulgaria undef.: Dubroviška cave, 1983: 1m, 1f (Belcheva et al. 1990).

DISTRIBUTIONAL STATUS (Fig. 3). *R. hipposideros* is the second most often recorded bat species (274 localities; Tab. 11). As in *R. ferrumequinum*, the species inhabits the whole Bulgarian territory. The most frequent records come from karstic regions, but the species is evidently absent in the highest parts of Bulgarian mountains. It has only rarely been recorded up to 1600 m a. s. l. (Rila Mts., Balkan Mts.). According to Pandurska (1997a), most localities with *R. hipposideros* in Bulgaria are situated within 100–600 m a. s. l., regular occurrence was recorded up to ca. 1300 m a. s. l. A similar widespread occurrence of *R. hipposideros* has also been demonstrated in neighbouring Balkan countries (Kryštufek et al. 1992, Valenciuc 1993, Stojanovski 1994, Uhrin et al. 1996a, Benda & Horáček 1998, Hanák et al. 2001).

The majority of records concerns bats roosting in caves and artificial underground spaces (in summer as well as in winter) and individuals netted in river valleys. However, there are also records in abandoned buildings and in the lofts of monasteries or churches, even at higher elevated karstic regions, and *R. hipposideros* tends to occupy buildings more often than *R. ferrumequinum*, which concerns the whole territory of southern Balkans. However, Pandurska (1997a) in her preliminary evaluation mentioned only 1% of findings in buildings, while in caves and mines she found 88% of all records. Regardless of the high number of records, this species is less abundant than the preceding one as evidenced by both number and sizes of summer colonies (tens of individuals only) and the number of winter records. External and cranial dimensions of examined specimens of *R. hipposideros* from Bulgaria are shown in Tab. 2.

Rhinolophus euryale Blasius, 1853

RECORDS. **Original data**: B l a g o e v g r a d: Ilindenci, rocky fissure [1], 7 July 1986: net. 1faL; – Ilindenci, Šaralijskata Peštera cave [2], 4 Febr. 1995: obs. ca. 100 ind., 15 Febr. 1998: obs. 75 ind., coll. 3 ind. (cf. Popov & Ivanova 2002), 19 Dec. 2002: obs. ca. 350 ind. (incl. a colony of ca. 250 ind.); – Kresna, Gara Pejo Javorov, building [3], 7 May 1994: obs. 30 ind.; – Kresna, Gara Pejo Javorov, gallery [4], 20 July 1990: obs. 5 ind., 18 May 1991: obs. 20 ind. (cf. Popov & Ivanova 2002); – Ploski [5], cave, 18 July 1981: obs. colony of ca. 1000 ind. (mixed with *R. ferrumequinum*), net. 57 ind. (coll. 6ma, 5ms, 11fa, 1fs, NMP 49991–49993, 50005–50023 [S+A], 50024, 50025 [A]), 16 July 1982: net. 1ma, 6fa, 2mj (coll. 1fa, NMP 50033 [S+B]), 17 July 1982: obs. colony 50 ind., 3 July 1986: obs. colony of ca. 300 ind., obs. solit. 1ma, 3 July 1986: net. 1ma, 14 August 1987: net. 1ma, 1fa (NMP 50064, 50065 [S+A]; leg. P. Musil), 30 July 1994: net. 2fa (NMP 50385, 50386 [A]), 31 July 1994: net. 1ma (NMP 50395 [A]); – Ribnovo, Manuilovata Peštera cave [6], 30 April 1994: coll. 2ma (NMNHS; cf. Popov & Ivanova 2002), 22 June 2000: net. 3ma. – B u r g a s: Bilka, Goljam Kamăk [7], cave, 13 July 1979: obs. colony of ca. 50 ind., net. 10fa (coll. 1fa, NMP 49804 [S+A]); – Černomorec, Nos Atija cape [8], abri, 12 July 1987: obs. 1ma; – Grudovo [9], large gallery, 11 July 1982: net. 1ma; – Mladežko, Kaleto cave [10], 1 May 1991: obs. 1ma; – Mladežko, Lejarnicite cave [11], 25 August 1999: net. 7ma, 2fa (coll. 1 ind., NMNHS 170); – Primorsko, Maslen Nos cape, cave [12], 5 June 1957: obs. large colony, coll. 1ma, 6fa, 1fj (NMP 49183, 49195, 49201 [S+A], 49194, 49196, 49199, 49200, 49343 [S+B]; cf. Hůrka 1958, Hanák & Josifov 1959), 15 Sept. 1962: coll. 1ms (IVB 5 [S+B]), coll. 1 ind. (cf. Popov & Ivanova 2002); – Primorsko, Maslen Nos cape, Karaul Taš [13], rocks, 11 August 1957: coll. 1 ind., 17 August 1971: obs. mixed colony of ca. 500 ind. (with *R. ferrumequinum*), coll. 8m, 46f, 9 ind. (NMP 38564, 38791, 38793, 38795 + 59 unnumbered spec. [S+B]; cf. Horáček et al. 1971); – Primorsko, Perla [14], abandoned building, 29 August 2000: obs. nurs. colony of ca. 2000 ind.; – Zvezdec, Goljama Văpa cave [15], Petrova Niva, 4 Jan. 2000: coll. 1 subfossil ind. – G a b r o v o: Armenite, Černata Peštera cave [16], 26 July 1998: obs. 73ma, 2fa; – Drjanovo, Andăka cave [17], 22 Febr. 1998: obs. colony of ca. 300 ind. of middle-sized *Rhinolophus* sp., incl. *R. euryale*; – Jantra, Prilepnata Peštera cave [18], 24 June 1995: obs., coll. 1 ind. (cf. Popov & Ivanova 2002). – H a s k o v o: Dolno Čerkovište, Zandana cave [19], 21 April 1996: obs. 4 ind. (cf. Ivanova 1997), 29 April 1997: obs. 4 ind. (cf. Ivanova 1997), 8 Febr. 1998: obs. 10 ind.; – Gaberovo, Gjurgen Dere [20], cave, 13 July 1997: obs. nurs. colony of 20 ind.; – Madžarovo, galleries [21], 12 Febr. 1996: obs. 1 ind., 20 April 1996: obs. 10 ind., 11 May 1996: net. 1ma, 13 April 1998: net. 1fa, 16 May 1998: net. 1ma, 27 Oct. 2002: obs. 1 ind. (leg. R. Lučan); – Spahievo, Aida hill [22], galleries, 16 July 1986: net. 1ma (NMP 50055 [S+B]). – J a m b o l: Melnica, Kesedžijca cave [23], 18 July

1998: obs. nurs. colony of ca. 600 ind. of middle-sized *Rhinolophus* sp., incl. *R. euryale*, 30 June 2000: obs. nurs. colony of ca. 600 ind. of middle-sized *Rhinolophus* sp., incl. *R. euryale*; – Melnica, Suhata Drănči Dupka cave [24], 21 Nov. 1997: coll. 1 subfossil ind. (cf. Popov & Ivanova 2002). – K ă r d ž a l i: Bjala Poljana, Manaf-Kojusju cave [25], 4 Jan. 1997: obs. 20 ind., 8 Febr. 1998: obs. 15 ind.; – Ribino, Aina Ini cave [26], 8 July 1995: obs. nurs. colony of ca. 360 ind. (cf. Ivanova 1997), 22 Oct. 1995: obs. (cf. Ivanova 1997), 1 May 1996: obs. 360 ind. (cf. Ivanova 1997), 11 June 1996: trap. 1ma, 4fa (cf. Ivanova 1997), 2 Jan. 1997: obs. 430 ind. (cf. Ivanova 1997), 14 July 1997: obs. nurs. colony of ca. 1750 ind. (cf. Ivanova 1997), 18 Nov. 1997: obs. 430 ind. (cf. Ivanova 1997), 9 Febr. 1998: 360 ind., 18 May 1998: obs. ca. 200 ind., 22 July 1998: obs. nurs. colony of ca. 550 ind., 11 Oct. 1998: trap. 10 ind., 4 March 1999: obs. 180 ind., 4 July 1999: obs. nurs. colony of ca. 700 ind., 30 Dec. 1999: obs. ca. 700 ind., 16 June 2000: obs. nurs. colony of ca. 1000 ind., 11 Sept. 2000: obs. ca. 1000 ind., 9 Sept. 2001: obs. ca. 1300 ind., coll. 3 ind. (cf. Popov & Ivanova 2002), 29 Sept. 2002: obs. 3 ind.; – Ribino, Samara cave [27], 20 April 1995: net. 7 ind. (cf. Ivanova 1997), 7 July 1995: net. 5ma, 1fa (cf. Ivanova 1997), 11 Oct. 1995: obs. 40 ind. (cf. Ivanova 1997), 1 May 1996: obs. 1ma (cf. Ivanova 1997), 21 Sept. 1996: net. 9ma, 6fa (cf. Ivanova 1997), 18 Nov. 1997: obs. 3 ind. (cf. Ivanova 1997), 9 Febr. 1998: obs. ca. 300 ind., 4 March 1999: obs. 120 ind., 30 Dec. 1999: obs. 2 ind., 1 ind. (cf. Popov & Ivanova 2002); – Visoka Poljana, Jarasă-Ini cave [28], 11 July 1995: obs. 4 ind. – K j u s t e n d i l: Trekljano, Jamkata cave [29], 3 June 1995: net. 1ma. – L o v e č: Bežanovo, Parnicite cave [30], 21 Jan. 1995: obs. ca. 700 ind., coll. 1fa (NMNHS 082; cf. Popov & Ivanova 2002), 20 Jan. 1996: obs. ca. 500 ind., coll. 1ma (NMNHS 057), 13 Jan. 2002: obs. 1430 ind. of middle-sized *Rhinolophus* sp., incl. *R. euryale*; – Čavdarci, Mandrata cave [31], 22 May 1999: net. 3ma, coll. 1 ind. (leg. C. Dietz; cf. Popov & Ivanova 2002), 25 June 2001: obs. nurs. colony; – Devetaki, Devetaškata Peštera cave [32], 23 March 1997: obs. ca. 1000 ind. of middle-sized *Rhinolophus* sp., incl. *R. euryale*, 24 Febr. 1998: obs. ca. 450 ind. of middle-sized *Rhinolophus* sp., incl. *R. euryale*, 30 July 1998: obs. ca. 800 ind. of middle-sized *Rhinolophus* sp., incl. *R. euryale*, 11 Sept. 1998: obs. ca. 200 ind. of middle-sized *Rhinolophus* sp., incl. *R. euryale*, 20 May 1999: net. 9ma, 1fa (leg. C. Dietz), 19 Jan. 2000: obs. 2 ind., 4 June 2000: obs. ca. 500 ind. of middle-sized *Rhinolophus* sp., incl. *R. euryale*, 14 July 2000: obs. ca. 2000 ind. of middle-sized *Rhinolophus* sp., incl. *R. euryale*, 25 June 2001: obs. ca. 4000 ind. of middle-sized *Rhinolophus* sp., incl. *R. euryale*; – Gložene, Ljastovicata cave [33], obs., coll. 1 ind. (cf. Popov & Ivanova 2002); – Gložene, Morovica cave [34], 18 April 1993: coll. 1ma (NMNHS 056), 3 ind. (cf. Popov & Ivanova 2002), 1 May 1994: net. 1ma, 25 Febr. 1998: obs. mixed colony of ca. 550 ind. *R. euryale* and *R. blasii*; – Gložene, Partizanskata cave [35], 31 July 1999: obs. 1mj, 1fa, 1fj (leg. N. Simov); – Karlukovo, cave behind monastery [36], 8 August 1978: net. 3ma, 11fa (coll. 1m, 3f, NMP 49756, 49757, 49762, 49763 [S+A]), 9 August 1978: net. 2ma, 3fa, 1 ind. (coll. 1ms, NMP 49778 [S+A]); – Karlukovo, ridge above a rocky amphitheatre [37], 3 July 1976: coll. 1faG (NMP 49352 [S+A]; cf. Kučera 1979, Hůrka 1984b), 5 July 1976: 1ma, 2faL, 1fs (NMP 49353–49359 [S+A]; cf. Kučera 1979, Hůrka 1984b), 12 June 1977: net. 6fa (NMP 49437–49441, 49638 [S+A]), 15 June 1977: net. 1fa, 1fs (NMP 49652, 49656 [S+A]); – Karlukovo, ridge of a rocky amphitheatre [38], 6 August 1978: coll. 1fa (NMP 49707 [S+A]); – Karlukovo, Čerdženica cave [39], 6 July 1975: net. 1ma, 6fa (NMP 50247–50253 [A]), 8 July 1975: net. 1ma; – Karlukovo, Temnata Dupka cave [40], 7 August 1978: net. 1fa (NMP 49749 [S+A]); – Karlukovo, Zadănenka cave (Zadănen Dol) [41], obs., coll. 1 ind. (cf. Popov & Ivanova 2002); – Kărpačevo, Fut'ovskata cave [42], 11 Sept. 1960: obs. 1ma, 1fa (leg. P. Beron), 23 May 1994: coll. 1ma (NMNHS 084); – Krušuna, Uruška Maara cave [43], 21 May 1993: coll. 1ma (NMNHS 089; cf. Popov & Ivanova 2002), 21 May 1994: net. 7ma, 2fa, obs. nurs. colony, 30 July 1998: obs. nurs. colony of ca. 1500 ind. of middle-sized *Rhinolophus* sp., incl. *R. euryale*, 3 June 2000: obs. nurs. colony of ca. 300 ind. of middle-sized *Rhinolophus* sp., incl. *R. euryale*, 25 June 2001: obs. nurs. colony of ca. 300 ind., coll. 1 ind. (cf. Popov & Ivanova 2002); – Mikre, Goljamata Mikrenska Peštera cave [44], 27 Jan. 1960: obs. (leg. P. Beron), 29 Jan. 1997: coll. 1ma (NMNHS 098), 4 June 2000: obs. ca. 1000 ind., 15 July 2000: obs. nurs. colony of ca. 2500 ind., 6 Sept. 2000: obs. ca. 100 ind.; – Tepava, Kănčova Vărpina cave [45], 9 August 1998: obs. ca. 200 ind. – M o n t a n a: Belimel, Parasinskata Propast chasm [46], 25 Febr. 2000: obs. ca. 350 ind., 18 July 2000: obs. nurs. colony of ca. 3000 ind.; – Gorna Luka, Vodni Peč cave [47], 25 Febr. 2000: obs. 2 ind.; – Mitrovci, Goljamata Mitrovska Peštera cave [48], 18 July 2000: obs. nurs. colony of ca. 100 ind. – P a z a r d ž i k: Gabrovica, Golaškata Peštera mine [49], coll. 1 subfossil ind. (cf. Popov & Ivanova 2002); – Peštera, Novata Peštera cave [50], 18 Sept. 1962: coll. 1ms, 3fs (IVB 6–9 [S+B]), 23 May 1966: obs. 1fa (leg. I. Grulich), 31 Nov. 1991: obs. ca. 90 ind.; – Peštera, Ušatovi Dupki cave [51], 8 August 1967: obs. nurs. colony of ca. 800 ind. (coll. 11ma, 6ms, 2mj, 6fa, 2fs, 1fj, IVB 18–45 [S+B]). – P l e v e n: Bohot, Kirov Vărtop cave [52], 6 April 1985: coll. 2fa (NMNHS 086, 087; leg. P. Beron, cf. Popov & Ivanova 2002); – Devenci, Hajduška Peštera cave [53], 7 July 1975: net. 4ma, 1fa (NMP 50263–50267 [A]), 14 June 1977: net. 1ms (NMP 49650 [S+A]), 10 May 1997: obs. ca. 200 ind., 18 Febr. 1998: obs. 150 ind. (cf. Pandurska 2003), 4 Dec. 1999: obs. 160 ind.; – Muselievo, Nanin Kamăk cave [54], 10 May 1997: obs. 50 ind., 21 June 1997: obs. 10 ind., 28 July 1998: obs. nurs. colony of ca. 30 ind., 26 May 2000: obs. 30 ind., 7 Sept. 2000: obs. 10 ind., 30 May 2001: obs. nurs. colony of ca. 50 ind., coll. 5 ind. (cf. Popov &

Ivanova 2002), 20 Dec. 2002: obs. ca. 70 ind. (leg. I. Borissov); – Rakita, Sedlarkata cave [55], 14 May 1998: net. 7ma, 3fa, obs. colony of ca. 100 ind., coll. 1 mummy (cf. Popov & Ivanova 2002); – Reselec [56], 15 July 1976: obs. 1 ind. (leg. Z. Boev). – R a z g r a d: Krivnja, Božkova Dupka cave [57], 8 July 1999: obs. 300 ind., 22 Jan. 2000: obs. 11 ind., 14 June 2000: obs. 10 ind. – R u s e: Červen, Zorovica cave [58], 31 Jan. 1998: obs. 3 ind., coll. 1 mummy (cf. Popov & Ivanova 2002), 9 Sept. 2000: obs. ca. 9000 ind. of middle-sized *Rhinolophus* sp., incl. *R. euryale*, 23 Sept. 2002: obs ca. 3000 ind.; – Pepelina, Orlova Čuka cave [59], 14 Dec. 1996: coll. 1ma (NMNHS 073; leg. P. Beron, cf. Popov & Ivanova 2002), 31 Jan. 1998: obs. ca. 4500 ind. of middle-sized *Rhinolophus* sp., incl. *R. euryale*, 4 Oct. 1999: net. 1 ind., 21 Jan. 2000: obs. 4000 ind. of middle-sized *Rhinolophus* sp., incl. *R. euryale*, coll. 4 ind. (cf. Popov & Ivanova 2002). – S i l i s t r a: Vojnovo, Malkata Badžalija cave [60], 16 April 1999: net. 1ma. – S l i v e n: Kotel, Bučaštata Peštera cave [61], obs., coll. 45 ind. (cf. Popov & Ivanova 2002); – Kotel, Nirica cave [62], 15 July 1979: obs. colony of ca. 50 ind.; – Kotel, Orlovata Peštera cave [63], Zelenič, 4 July 2000: obs. 1fa (cf. Popov & Ivanova 2002); – Kotel, Subatta, Zlosten [64], 5 July 2000: obs. nurs. colony of ca. 400 ind.; – Sliven, Zmejovi Dupki cave [65], 25 May 1957: obs. colony (coll. 4ma, 2ms, 2fa, 2fs, NMP 49170, 49175, 49182 [S+A], 49167–49169, 49171–49174 [S+B]; cf. Hůrka 1958, Hanák & Josifov 1959, Dusbábek 1964a), 15 July 1975: obs. colony of. ca. 100 ind. (coll. 4ma, 1ms, 8fa, 2fs, NMP 49675–49681, 49685 [S+B], NMP 50274–50277, 50282, 50284 [S+A]; cf. Kučera 1979), 12 August 1983: net. 1ma. – S m o l j a n: Orehovo, cave 100 m W of the village [66], 24 August 1980: net. 1ma, 1fa, 1fj (coll. 1m, 1f, NMP 49994, 49995 [S+A]), 25 August 1980: net. 1fa, 28 June 1984: net. 1fa (NMP 50041 [S+A]; leg. T. Scholz & D. Král), 30 June 1984: net. 1ma (NMP 50044 [S+A]; leg. T. Scholz & D. Král); – Orehovo, cave in a quarry [67], 24 August 1980: net. 1ma (NMP 49995 [S+A]), 25 August 1980: net. 1ma. – S o f i j a: Lakatnik, Rážiškata (= Suhata) Peštera cave [68], 21 Dec. 1956: coll. 1 ind. (NMP 50142 [S+B]); – Lakatnik, Svinskata Dupka cave [69], obs. colony, coll. 1 ind. (cf. Popov & Ivanova 2002); – Lakatnik, Temnata Dupka cave [70], 9 July 1982: net. 1ma; – Lipnica, Kozarnika cave [71], 21 May 1997: net. 10 ind.; – Praveška Lakavica, Al'ova Dupka cave [72], 5 Febr. 1994: coll. 1 ind. (leg. P. Beron). – Š u m e n: Divdjadovo, Zandana cave (Divdjadovski) [73], 29 June 1995: obs. nurs. colony of ca. 500 ind. (cf. Ivanova 2001, Popov & Ivanova 2002), 30 June 2000: obs. nurs. colony of ca. 200 ind. of middle-sized *Rhinolophus* sp., incl. *R. euryale* (cf. Ivanova 2001); – Madara, Hiljadite Očički [74], cave, 28 June 1995: obs. several ind. (cf. Ivanova 2001), 4 Oct. 1996: coll. 1fa (NMNHS 066; cf. Ivanova 2001, Popov & Ivanova 2002), 1 July 2000: obs. several ind. (cf. Ivanova 2001); – Šumen, Zandana cave [75], 23 Jan. 2000: obs. 1 ind. (cf. Ivanova 2001), 29 June 2000: obs. 1 ind. (cf. Ivanova 2001). – T ă r g o v i š t e: Prolaz, Derventskata Peštera cave [76], 4 Oct. 1996: coll. 1ma (NMNHS 067; cf. Popov & Ivanova 2002), 2 July 2000: obs. nurs. colony of ca. 300 ind. of middle-sized *Rhinolophus* sp., incl. *R. euryale* (cf. Ivanova 2001). – V e l i k o T ă r n o v o: Emen, Emenskata Peštera cave [77], 13 April 1996: obs. ca. 500 ind., 21 Febr. 1998: obs. ca. 500 ind., 15 May 1998: obs. ca. 1000 ind. of middle-sized *Rhinolophus* sp., incl. *R. euryale*, 27 July 1998: obs. nurs. colony of ca. 450 ind.; 25 May 1999: obs. 10 ind., 29 May 2000: obs. ca. 100 ind. of middle-sized *Rhinolophus* sp., incl. *R. euryale*, 23 Sept. 2000: obs. ca. 300 ind. of middle-sized *Rhinolophus* sp., incl. *R. euryale*, coll. 11 ind. (cf. Popov & Ivanova 2002). – V i d i n: Car Petrovo, Vărkan cave [78], 27 Febr. 2000: obs. 120 ind., 27 July 2000: obs. nurs. colony of ca. 5000 ind.; – Gorni Lom, Desni Suhi Peč cave [79], 10 July 1960: obs. 2 ind. (leg. P. Beron), 19 July 2000: obs. 6ma, 1fa; – Orešec, Peč cave (Suhi Peč) [80], 24 Febr. 1995: coll. 1 ind. (NMNHS), 20 Febr. 1998: obs. 50 ind. (leg. R. Pandurska), 26 Febr. 2000: obs. 16 ind., 20 July 2000: obs. nurs. colony of ca. 200 ind. (coll. 1 ind.; NMNHS 169); – Rabiša, Magura cave [81], 21 mummies (cf. Popov & Ivanova 2002); – Vărtop, Prileparnika cave [82], 23 Febr. 1995: obs. 5 ind. – V r a c a: Beli Izvor, Kalna Mătnica cave (Toškova Dupka) [83], 22 July 2000: obs. nurs. colony of ca. 100 ind.; – Botunja, Bilernicite cave [84], 12 June 1994: obs. ca. 200 ind.; – Čiren, Ponora cave [85], 22 April 1995: net. ca. 100 ind., 27 Jan. 1998: obs. ca. 1000 ind. of middle-sized *Rhinolophus* sp., incl. *R. euryale*, 27 July 2000: obs. nurs. colony of ca. 5000 ind.; – Kalen, Kalenskata Peštera cave [86], 22 April 2000: obs. ca. 1000 ind. of middle-sized *Rhinolophus* sp., incl. *R. euryale*; – Kunino, cave [87], April 1964: coll. 1ma (NMNHS; leg. P. Beron). – **Published data**: B u r g a s: Burgas, galleries N of the town [88], 25 March 1955: 2m, 28f [NMNHS] (Hanák & Josifov 1959); – Primorsko, Maslen Nos cape, cave [12], 10 August 1957 (Beron 1958), 27 July 1968 (Beron 1973a); – Strandjabalkan [= Strandža Mts.], two caves, 1935 (Heinrich 1936) = Mladežko, cave, 23 July 1935 [1ma, NMNHS] [89] (Hopkins & Rotschild 1956). – G a b r o v o: Drjanovo, Bačo Kiro cave [90] (Grimmberger 1993). – K j u s t e n d i l: Rila, Metoh Orlica [91], old building, 1000 m a. s. l. (Beron et al. 2000b); – L o v e č: Brestnica, Săeva Dupka cave [92], 3 March 1958: 1 ind. (Beron 1958); – Devataki, Devetaškata Peštera cave [32] (Kovačev 1925, Beron 1962), Dec. 1988: colony of ca. 250–300 ind. (Beškov 1993, Beshkov 1998, cf. Pandurska 1999), 1998: 250 ind. (Pandurska 2003); – Gložene, Morovica cave [34], net. (Beškov 1993, Beshkov 1998); – Gradešnica, Rušovata Peštera cave [93], 1 March 1958: 1 ind. (Beron 1958); – Karlukovo, Zadănen Dol near Prohodna cave [94], summer 1988: 1 ind. (Popov & Ivanova 1995); – Kărpačevo, Fut'ovskata Peštera cave [42], 11 Sept. 1960 (Beron 1962, 1964b), 3 ind. (Popov & Ivanova 2002); – Krušuna, Uruška Maara cave [43], 10 Sept. 1960 (Beron 1962). – P a z a r d ž i k: Gabrovica, Golak, Golaškata Peštera mine [49],

31 March 1958: 29 ind. (Beron 1958, Beškov 1962); – Peštera, Lilova cave [95], 15 August 1985: net. 2m (Grimmberger 1993); – Peštera, Ušatovi [Dupki] cave [51], nurs. colony of ca. 200 ind. (Grimmberger 1993). – P e r n i k: Bosnek, Duhlata cave [96], 25 August to 5 Sept. 1967: 1 skull (Hazelton 1970). – P l e v e n: Devenci, Hajduškata Peštera cave [53], Dec. 1988: 250 ind. (Beškov 1993, Beshkov 1998, cf. Pandurska 2003). – R a z g r a d: Krivnja, Božkova Dupka cave [57], April 1988: 300–400 ind. (Beškov 1993, Beshkov 1998). – R u s e: Sredna Kula [= Ruse] [97], 12 Febr. 1957 (Undžijan 1998) (possibly a record of *R. blasii*, see Kvartirnikov 1957). – S l i v e n: Kotel [98], May, 3 ind. (Jančev & Stojkova 1973). – S o f i j a: Lakatnik, Răžiškata cave [68], 1991–1998 (Pandurska & Beshkov 1998a); – Lakatnik, Temnata Dupka cave [70], 11 March 1912: 1f [NMNHS] (Bureš 1917, Kovačev 1925, Beron 1962); – Lipnica, Boženiški Urvič [99], 1991–1998 (Pandurska & Beshkov 1998a); – Lipnica, Kozarnika cave [71], 1991–1998 (Pandurska & Beshkov 1998a). – V i d i n: Orešec, Suhi Peč cave [80], 1991–1998 (Pandurska & Beshkov 1998a), 3 ind. (Popov & Ivanova 2002); – Tărgovište, Temnata Dupka cave [100], 1991–1998 (Pandurska & Beshkov 1998a). – V e l i k o T ă r n o v o: Beljakovec, Goljama Podlisca cave [101], 24 May 1924: many ind. (Bureš 1926). – V r a c a: Čiren, Malkata Peštera cave [102], 27 Oct. 1960 (Beron 1961, Beron & Guéorguiev 1967); – Glavaci, Tošova Dupka cave [= Beli Izvor, Kalna Mătnica] [83], 17 Febr. 1968 (Beron 1974b); – Kalen, Kalenska Pešt cave [86], March 1989: 75 ind. (Beškov 1993, Beshkov 1998); – Liljače, Božija Most cave [103], 10–11 July 1986: obs. colony of ca. 100–200 ind. (Grimmberger 1993); – Staro Selo, Tatarkinjata cave [104], 1 ind. (Popov & Ivanova 2002).

DISTRIBUTIONAL STATUS (Fig. 4). According to the number of records (104 localities; Tab. 11), *R. euryale* is the most common of the three medium-sized horseshoe species (*R. euryale*, *R. mehelyi* and *R. blasii*). Its recorded abundance seems to be real in spite of possible species misidentifications of certain individuals of medium-sized horseshoe bats, since the number of Bulgarian localities reported to harbour *R. euryale* is almost double when compared with that of *R. blasii* and triple when compared with that of *R. mehelyi* (see Tab. 11). This roughly corresponds to previous data from Bulgaria (Pandurska 1997b, Popov & Ivanova 2002) and also to the information concern-

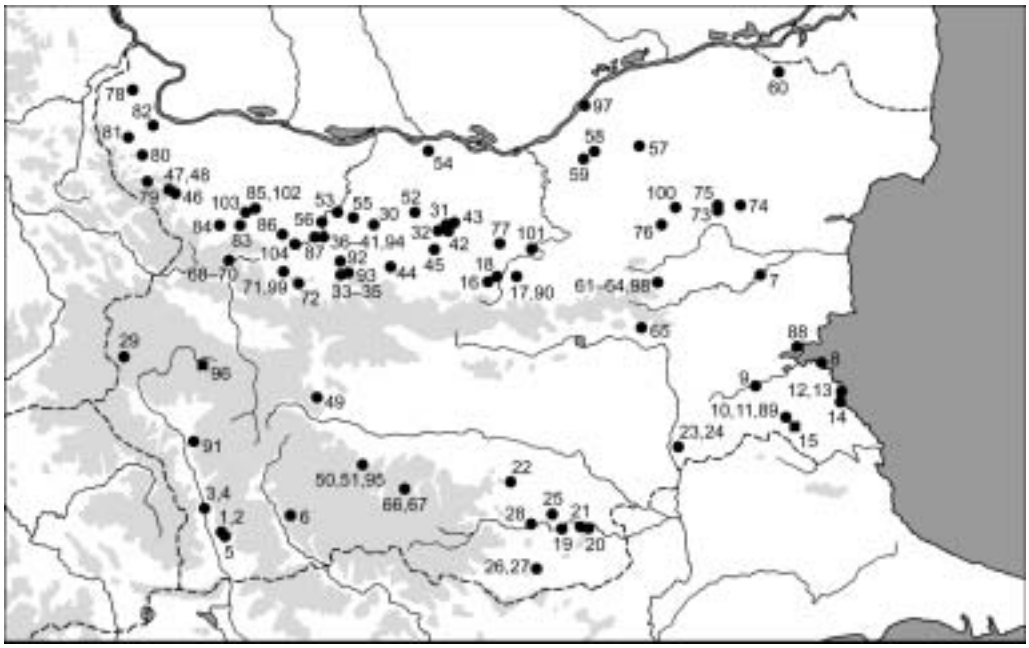

Fig. 4. Records of *Rhinolophus euryale* Blasius, 1853 in Bulgaria. Explanation of symbols as in Fig. 3. Numbers correspond with locality numbers in the text.

Tab. 3. Basic biometric data for examined Bulgarian samples of *Rhinolophus euryale* Blasius, 1853, *R. mehelyi* Matschie, 1901, and *R. blasii* Peters, 1866. For abbreviations see p. 250

	Rhinolophus euryale					*Rhinolophus mehelyi*					*Rhinolophus blasii*				
	n	min	max	M	SD	n	min	max	M	SD	n	min	max	M	SD
LC	155	43.0	58.0	52.0	3.101	7	51.0	60.0	56.4	3.409	–	–	–	–	–
LCd	154	21.0	35.0	27.1	2.392	7	23.0	31.0	27.7	2.928	–	–	–	–	–
LAt	156	45.0	52.5	48.7	1.245	9	47.0	53.5	50.2	2.123	–	–	–	–	–
LA	151	15.5	24.5	20.3	1.734	7	21.5	24.5	22.8	1.286	–	–	–	–	–
G	93	9.0	19.5	11.5	1.922	6	10.0	16.0	13.0	2.530	–	–	–	–	–
LCr	135	18.12	19.57	18.94	0.281	12	19.66	20.58	20.24	0.244	8	19.18	20.02	19.65	0.274
LCc	144	14.93	16.75	16.22	0.238	18	16.71	17.56	17.26	0.236	14	16.32	17.17	16.82	0.228
LaZ	157	8.76	9.82	9.40	0.188	19	10.21	10.72	10.41	0.144	13	8.98	9.32	9.17	0.094
LaI	170	1.92	2.57	2.24	0.118	19	2.19	2.91	2.54	0.201	14	2.25	2.59	2.43	0.095
LaN	164	6.02	8.88	8.31	0.264	19	8.44	9.03	8.78	0.195	14	8.25	8.65	8.50	0.112
AN	143	5.49	6.34	5.93	0.162	19	6.08	6.61	6.28	0.155	14	5.77	6.38	6.13	0.193
CC	166	3.42	4.83	4.54	0.196	16	4.66	5.28	5.02	0.183	13	4.22	4.62	4.40	0.116
M^3M^3	171	5.13	6.87	6.59	0.192	19	7.03	7.44	7.26	0.127	13	6.33	6.65	6.44	0.097
CM^3	173	5.69	6.55	6.22	0.127	18	6.60	7.02	6.81	0.115	14	6.54	6.76	6.66	0.085
LMd	165	10.82	12.22	11.71	0.201	19	12.20	13.07	12.70	0.241	13	11.60	12.22	11.93	0.171
ACo	162	2.22	2.92	2.53	0.117	19	2.77	3.12	2.93	0.109	13	2.52	3.02	2.78	0.141
CM_3	168	5.91	6.92	6.60	0.129	18	6.84	7.39	7.23	0.135	13	6.86	7.15	6.97	0.099

ing Macedonia (Kryštufek et al. 1992), Turkish Thrace (Benda & Horáček 1998) and possibly also Albania (Uhrin et al. 1996a). All countries mentioned above are situated at approximately the same northern latitude. In more southerly situated Greece, *R. blasii* is the dominant species among the medium-sized horseshoe bats (Hanák et al. 2001), and this phenomenon is also evident in southern regions of Bulgaria (Popov & Ivanova 2002).

R. euryale occurs on the whole Bulgarian territory as evidenced by records in all systematically studied regions. It prefers karstic regions of the Danubian Lowland and the northern foothils of the Balkan Mts. (Predbalkan area) (cf. Pandurska 1997b). Its nursery colonies were found in both caves and buildings, the colonies in buildings consist of tens to hundreds of individuals (maximum ca. 2000 ind., a mixed colony with *R. mehelyi*), those in caves amount to several thousands of individuals (maximum ca. 9000 ind.). Large summer aggregations in caves, however, often concern two or more horseshoe bat species (*R. ferrumequinum* being frequent), *R. euryale* was also found to be associated with *Myotis emarginatus*. Preliminary altitudinal data show a preference of localities within 300–500 m a. s. l. in Bulgaria (Pandurska 1997b). Most summer records concern low and medium elevations (0–700 m a. s. l.), hibernating quarters are elevated up to 1500–1700 m (e. g., Šaralijskata cave near Ilindenci, ca. 1700 m a. s. l.). More important for an occurrence of the species seems therefore to be presence of karstic phenomena than an altitude; in the whole Balkans, *R. euryale* is one of the most frequently recorded bats in karstic regions (Hanák et al. 2001, Kryštufek et al. 1992, Uhrin et al 1996a, Benda & Horáček 1998, Paunović & Stamenković 1998). From among the three medium-sized *Rhinolophus* species, the area of distribution of *R. euryale* reaches the most northwardly, up to northern Croatia and Hungary, southern Slovakia and western Romania (Đulić 1959, Topál 1956, Uhrin et al. 1996b, Gheorghiu et al. 2001). External and cranial dimensions of examined specimens of *R. euryale* from Bulgaria are shown in Tab. 3.

Rhinolophus mehelyi Matschie, 1901

Records. **Original data**: B l a g o e v g r a d: Ploski [1], cave, 17 July 1982: net. 1fj (*R.* cf. *mehelyi*). – B u r g a s: Primorsko, Perla [2], abandoned building, 29 August 2000: obs. 2 ind. – H a s k o v o: Madžarovo [3], gallery,

29 Sept. 2003: obs. 1 ind. (leg. R. Lučan). – J a m b o l: Lesovo [4], gallery, 14 April 1990: coll. 1ma (NMNHS; leg. P. Stoev, cf. Popov & Ivanova 2002), 20 Nov. 1997: obs. 120 ind.; – Melnica, Suhata Drănči Dupka cave [5], 21 Nov. 1997: coll. 1 subfossil ind. (cf. Popov & Ivanova 2002); – Ustrem, Bozkite cave [6], 10 April 1998: net. 2faL. – K ă r d ž a l i: Bjala Poljana, Manaf-Kojusju cave [7], 8 Febr. 1998: obs. 1fa (cf. Popov & Ivanova 2002); – Dolno Čerkovište [8], small cave, 30 Sept. 2003: net. 2ma (leg. R. Lučan); – Ribino, Aina Ini cave [9], 8 July 1995: obs. nurs. colony of ca. 50 ind. (cf. Ivanova 1997), 1 May 1996: obs. 50 ind. (cf. Ivanova 1997), 23 Sept. 1996: obs. 1fa (cf. Ivanova 1997), 2 Jan. 1997: obs. 60 ind. (cf. Ivanova 1997), 14 July 1997: obs. nurs. colony of ca. 250 ind. (cf. Ivanova 1997), 18 Nov. 1997: obs. 60 ind. (cf. Ivanova 1997), 9 Febr. 1998: obs. 50 ind., 18 May 1998: obs. 30 ind., 22 July 1998: obs. nurs. colony of ca. 80 ind., 4 March 1999: obs. 30 ind., 4 July 1999: obs. nurs. colony of ca. 100 ind., 30 Dec. 1999: obs. ca. 100 ind., 18 June 2000: obs. nurs. colony of ca. 200 ind., 11 Sept. 2000: obs. 150 ind., 9 Sept. 2001: obs. 150 ind., coll. 1 ind. (cf. Popov & Ivanova 2002); – Ribino, Samara cave [10], 7 July 1995: net. 1ma (cf. Ivanova 1997), 9 Febr. 1998: obs. 40 ind., 4 March 1999: obs. 20 ind. – L o v e č: Bežanovo, Parnicite cave [11], obs., coll. 1 ind. (cf. Popov & Ivanova 2002); – Devetaki, Devetaškata Peštera cave [12], 20 May 1999: net. 1ma; – Krušuna, Uruška Maara cave [13], 30 July 1998: obs. colony, 25 June 2001: obs. nurs. colony of ca. 700 ind. – P l e v e n: Muselievo, Nanin Kamăk cave [14], 10 May 1997: obs. colony of ca. 400 ind., 21 June 1997: obs. nurs. colony of ca. 250 ind., coll. 1ma (NMNHS 106; cf. Popov & Ivanova 2002), 26 May 2000: obs. 250 ind., 30 May 2001: obs. nurs. colony of ca. 20 ind., coll. 4 ind. (cf. Popov & Ivanova 2002), 20 Dec. 2002: obs. ca. 70 ind. (leg. I. Borissov); – Rakita, Sedlarkata cave [15], 14 May 1998: net. 1fa, 4 Dec. 1999: obs. 4 ind. – R u s e: Červen, Zorovica cave [16], 9 Sept. 2000: obs. mixed colony of ca. 5000 ind. *R. mehelyi* and *R. euryale*, 23 Sept. 2002: obs. ca. 3000 ind.; – Nisovo [17], small cave, 8 April 1991: obs. 5 ind.; – Pepelina, Orlova Čuka cave [18], 16 Oct. 1993: coll. 1fa (NMNHS; cf. Popov & Ivanova 2002), 2 July 1996: obs. 1ma, 31 Jan. 1998: obs. mixed colony of ca. 4500 ind. *Rhinolophus* sp., incl. *R. mehelyi*, 4 Oct. 1999: net. 2 ind. (cf. Popov & Ivanova 2002), 21 Jan. 2000: obs. mixed colony of ca. 4000 ind. *Rhinolophus* sp., incl. *R. mehelyi*. – S l i v e n: Sliven, Zmejovi Dupki cave [19], 27 May 1957: coll. 1ma (NMP 49176 [S+B]; cf. Hůrka 1958, Hanák & Josifov 1959), 15 July 1975: net. 6ma (NMP 49674, 49682, 49683 [S+B], 50279, 50280, 50288 [S+A]; cf. Kučera 1979). – S o f i j a: Lakatnik, Temnata Dupka cave [20], 10 Febr. 1965: coll. 1fs (IVB 46 [S+B]). – Š u m e n: Madara, Hiljadite Očički [21], cave, 28 June 1995: obs.

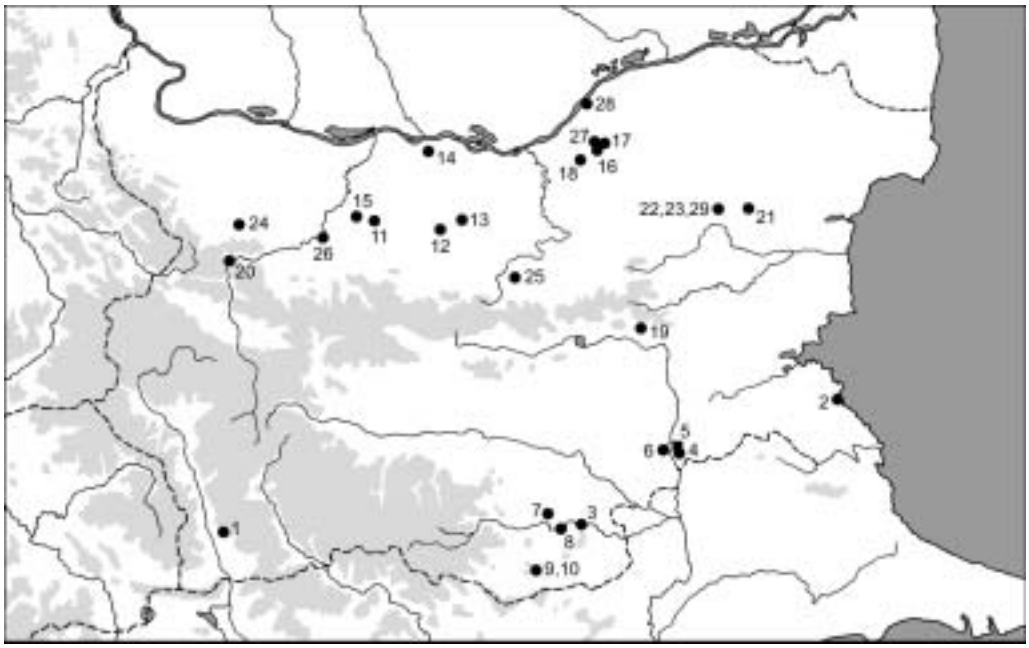

Fig. 5. Records of *Rhinolophus mehelyi* Matschie, 1901 in Bulgaria. Explanation of symbols as in Fig. 3. Numbers correspond with locality numbers in the text.

several ind. (cf. Ivanova 2001), 4 Oct. 1996: obs. several ind. (cf. Ivanova 2001), 1 July 2000: obs. several ind. (cf. Ivanova 2001); – Šumen, Zandana cave [22], 23 Jan. 2000: obs. ca. 150 ind. (cf. Ivanova 2001), 29 June 2000: obs. nurs. colony of ca. 200 ind. (cf. Ivanova 2001); – Šumen, Šumensko Plato, Zvezdna cave [23], 30 Sept. 1996: obs. 2ma. – V r a c a: Beli Izvor, Kalna Mătnica cave (Toškova Dupka) [24], 17 Febr. 1968: coll. 1ma (NMNHS; leg. P. Beron), 2 ind. (Popov & Ivanova 2002). – **Published data**: G a b r o v o: Drenovo, resp. Drjanovo [25], 16 Febr. 1951 [NMNHS] (Hanák & Josifov 1959, Beron 1964b). – L o v e č: Bežanovo, Parnicite cave [11], 2 ind. (Beron 1964b), 17 Febr. 1963: 3 ind. (Jančev & Stojkova 1973); – Karlukovo, Zadănen Dol near Prohodna cave [26], summer 1988: 1 ind. (Popov & Ivanova 1995). – P l e v e n: Muselievo, Nanin Kamăk cave [14], 9 August 1971 [1fa, NMNHS] (Beron 1972, 1973a, b, 1974b). – R u s e: Košov [27], 4 August 1961: 1 ind. (Undžijan 1998); – Sredna Kula [= Ruse] [28], 12 Febr. 1957: 1 ind. (Undžijan 1998). – S l i v e n: Kotel, Orlovata Peštera cave [29], 1 ind. (Beron 1962, 1964b); – Sliven, Zmejovi Dupki cave (Beron 1964b).

DISTRIBUTIONAL STATUS (Fig. 5). *R. mehelyi* seems to be the rarest from the three medium-sized horseshoe bats (29 localities; Tab. 11). It means that in Bulgaria the species is the rarest member of Rhinolophidae, as has already been pointed out by Popov & Ivanova (2002). Its status is very similar in Greece (Hanák et al. 2001), Turkish Thrace (Benda & Horáček 1998), and Macedonia (Kryštufek et al. 1992). The records in north-western Bulgaria (Kalna Mătnica cave near Beli Izvor) and in the Danubian Lowland (Nanin Kamăk cave near Muselievo) represent a part of the northtern margin of the known distribution range of the species in the Balkans, connected with its distribution area in eastern Serbia (Paunović et al. 1998) and Macedonia (Kryštufek et al. 1992). Only in the eastern part of the Danubian Lowland and in karstic region of Romanian Dobrogea, the range of *R. mehelyi* extends more to the north (Červený 1982, Valenciuc 1993, Hermanns et al. 2002).

The distribution of records suggests the species' occurrence in most regions within Bulgaria where there are karstic phenomena or artificial underground spaces (cf. Popov & Ivanova 2002). In a single case only, the species was found in an abandoned building, in a mixed colony with *R. euryale*. The records come from lower and medium elevations (90–630 m a. s. l.), it seems therefore that *R. mehelyi* avoids higher situated localities. Nursery colonies in caves amount to tens, hundreds and even thousands of individuals (maximum 5000 ind.), mostly comprising mixed aggregations of two or more horseshoe bat species. External and cranial dimensions of examined specimens of *R. mehelyi* from Bulgaria are shown in Tab. 3.

Rhinolophus blasii Peters, 1866

RECORDS. **Original data**: B l a g o e v g r a d: Ribnovo, Manuilovata Peštera cave [1], 22 June 2000: net. 2ma. – B u r g a s: Mladežko, cave [2], 30 July 1935: coll. 1ma (NMNHS; leg. G. Heinrich; cf. Heinrich 1936 [as *R. euryale*]); – Mladežko, Kaleto cave [3], 1 May 1991: obs. 1fa, 3 Jan. 2000: obs. 3 ind.; – Mladežko, Lejarnicite cave [4], 25 August 1999: net. 1ma. – G a b r o v o: Armenite, Černata Peštera cave [5], 26 July 1998: obs. 1ma. – H a s k o v o: Dolno Čerkovište, Zandana cave [6], 21 April 1996: obs. 6 ind. (cf. Ivanova 1997), 29 April 1997: obs. 6 ind. (cf. Ivanova 1997), 8 Febr. 1998: obs. 25 ind., coll. 1 ind. (cf. Popov & Ivanova 2002); – Madžarovo, gallery [7], 20 April 1996: obs. 6 ind., 16 May 1998: net. 1ma, 28 Sept. 2003: net. 1ma (leg. R. Lučan). – J a m b o l: Melnica, Suhata Drănči Dupka cave [8], 21 Nov. 1997: obs. 1 ind. – K ă r d ž a l i: Bjala Poljana, Manaf-Kožusju cave [9], 4 Jan. 1997: obs. 25 ind., 8 Febr. 1998: obs. 13 ind.; – Dăždovnica, Hasarskata Peštera cave [10], 18 Nov. 1991: obs. 13 ind., 23 Sept. 1996: obs. 12 ind.; – Egrek, Rupata cave [11], obs., coll. 1 ind. (cf. Popov & Ivanova 2002); – Ribino, Aina Ini cave [12], 8 July 1995: obs. nurs. colony of ca. 590 ind. (cf. Ivanova 1997), 22 Oct. 1995: obs. (cf. Ivanova 1997), 1 May 1996: obs. 590 ind. (cf. Ivanova 1997), 11 June 1996: trap. 7fa (cf. Ivanova 1997), 2 Jan. 1997: obs. ca. 700 ind. (cf. Ivanova 1997), 14 July 1997: obs. nurs. colony of 2950 ind. (cf. Ivanova 1997), 18 Nov. 1997: obs. ca. 700 ind. (cf. Ivanova 1997), 9 Febr. 1998: obs. 590 ind., 18 May 1998: obs. 350 ind., 22 July 1998: obs. nurs. colony of 880 ind., 4 March 1999: obs. ca. 300 ind., 4 July 1999: obs. nurs. colony of ca. 1200 ind., 30 Dec. 1999: obs. ca. 1200 ind., 18 June 2000: obs. nurs. colony of ca. 1800 ind., 11 Sept. 2000: obs. 1770 ind., 9 Sept. 2001: obs. 2050 ind., coll. 3 ind. (cf. Popov & Ivanova 2002), 29 Sept. 2002: obs. 7 ind.; – Ribino, Samara cave [13], 20 April 1995: net. 15 ind. (cf. Ivanova 1997), 7 July 1995: net. 3ma, 5fa (cf. Ivanova 1997), 11 Oct. 1995: obs. 59 ind., exam. 1ma (cf. Ivanova 1997), 21 Sept. 1996: net. 13ma, 3fa (cf. Ivanova 1997), 18 Nov. 1997: obs. 2 ind. (cf. Ivanova 1997), 9 Febr. 1998: obs. 470 ind., 4 March 1999: obs. 190 ind., 30 Dec. 1999: coll. 1 ind. (cf. Popov & Ivanova 2002); – Tărnovci,

Karaguk cave [14], obs., coll. 7 ind. (cf. Popov & Ivanova 2002). – K j u s t e n d i l: Gorna Koznica, Asandelija cave [15], 9 Febr. 1994: obs. 1fa (cf. Beron 1994, Ivanova et al. 1995); – Trekljano [16], 8 July 1929: coll. 1ma (NMNHS 187; leg. N. Radev); – Trekljano, Jamkata cave [17], 29 Oct. 1966: coll. 1ma (NMNHS; leg. P. Beron; cf. Jančev & Stojkova 1973, Popov & Ivanova 2002), 1 ind. (cf. Popov & Ivanova 2002). – L o v e č: Bežanovo, Parnicite cave [18], 21 Jan. 1995: obs. ca. 300 ind., coll. 1fa (NMNHS 054; cf. Popov & Ivanova 2002), 20 Jan. 1996: obs. ca. 200 ind.; – Gložene, Morovica cave [19], 18 April 1993: obs. 2ma, 1 May 1994: net. 1ma, 25 Febr. 1998: obs. mixed colony of ca. 550 ind. *R. blasii* and *R. euryale*; – Karlukovo, cave behind monastery [20], 8 August 1978: obs. 2 ind. – M o n t a n a: Gorna Luka, Suhi Peč cave [21], 19 July 2000: obs. 1fa+j. – P l e v e n: Rakita, Sedlarkata cave [22], 14 May 1998: net. 1ma. – S m o l j a n: Mogilica, Uhlovica cave [23], 20 July 1996: net. 1ma. – S o f i j a: Lakatnik, Svinskata Dupka cave [24], 22 Febr. 1995: coll. 1fa (NMNHS; cf. Popov & Ivanova 2002); – Lakatnik, Temnata Dupka cave [25], 10 Febr. 1965: coll. 1fs (NMP 50101 [S+B]), 9 July 1982: net. 2ma. – V i d i n: Gorni Lom, Levi Suhi Peč cave [26], 17 Sept. 1964: coll. 1 ind. (leg. P. Beron). – **Published data**: B l a g o e v g r a d: Ploski, rocky crevice [27], 14 Sept. 1997: net. some ind. (Pandurska & Beshkov 1998b). – B u r g a s: Primorsko, Maslen Nos cape [28], cave, 5 June 1957 (Hanák & Josifov 1959), 10 August 1957: 8 ind. (Beron 1958); – Rezovo [29], cave, Oct. 1968: 33 ind. (Kojumdžieva 1973). – J a m b o l: Ustrem, Sveti Duh monastery, Bozkite cave [30], 7 July 1959: ca. 250 ind. (Beron 1961, 1962), August 1959: ca. 200 ind. (Beron 1964b), March 1962: 1500 ind. (Beron 1964b), Jan. 1971: ca. 800 ind. (Beškov 1993, Beshkov 1998). – K ă r d ž a l i: Gorna Snežina, Hisarska Peštera cave [= Dăždovnica, Hasarskata Peštera] [10], 16 Dec. 1962 (Jančev & Stojkova 1973); – Tărnovci, Pešterata cave [31], 10 August 1960 (Beron 1962). – L o v e č: Bežanovo, Parnicite cave [18], 99 ind. (Beron 1964b); – Karlukovo, Zadănen Dol, near Prohodna cave [32], summer 1992: 4 ind. (Popov & Ivanova 1995). – M o n t a n a: Čerkaski, Grimnena Dupka cave [33], 29 Oct. 1971 (Beron 1972, 1973a); – Gorna Luka, Mišin Kamăk cave [34], 29 Jan. 1961 (Beron 1962); – Prevala, Vreloto cave [35] (Beron & Guéorguiev 1967). – P a z a r d ž i k: Gabrovica, Golak, Golaškata Peštera mine [36], 40–50 ind. (Beškov 1993, Beshkov 1998); – Velingrad, Novata Peštera cave [37], 12 Sept. 1962 (Beron & Guéorguiev 1967). – P e r n i k: Rajanci, Jamkata cave [38], 29 Oct. 1966 (Beron 1968). – P l e v e n: Devenci, Hajduškata Peštera cave [39], 9 Febr. 1964 (Jančev & Stojkova 1973); – Reselec, Temnata Dupka cave [40], 21 April 1966 (Beron & Guéorguiev 1967). – R u s e: Pisanec [41], 1 ind. of cf. *R. blasii* (from owl pellets) (Mitev

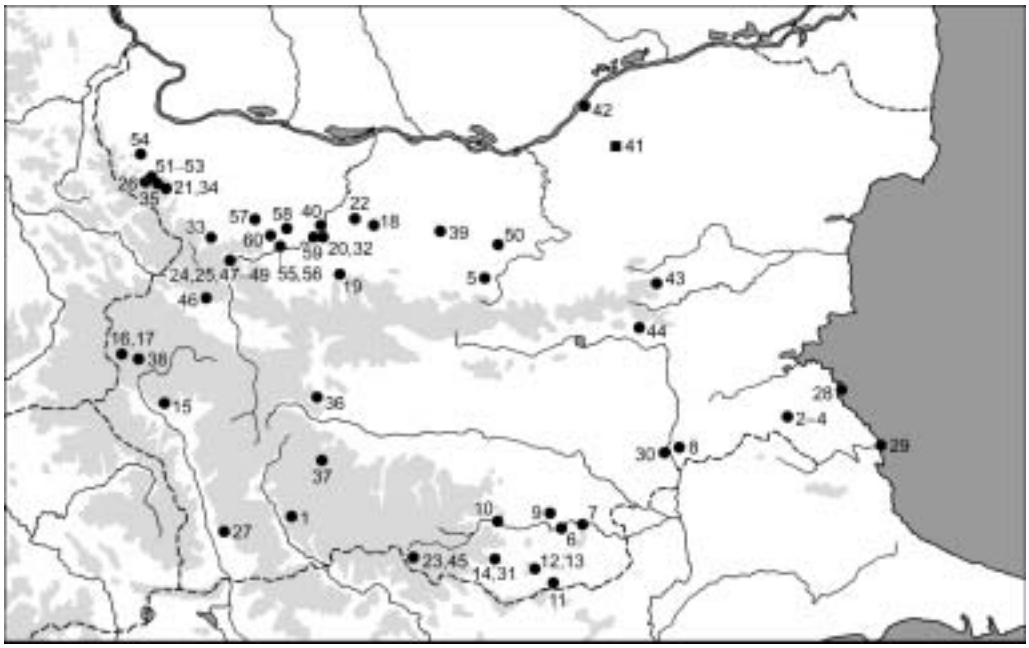

Fig. 6. Records of *Rhinolophus blasii* Peters, 1866 in Bulgaria. Explanation of symbols as in Fig. 3. Numbers correspond with locality numbers in the text.

1995); – Sredna Mera [= Sredna Kula, Ruse] [42], cave, 1 ind. (Kvartirnikov 1957). – S l i v e n: Kotel, Orlovata Peštera cave [43], 9 April 1959 (Beron 1962), 21 May 1968 (Jančev & Stojkova 1973); – Sliven, Zmejovi Dupki cave [44], 8 August 1957 (Beron 1958). – S m o l j a n: Smoljan, caves n. Arda river [45], 26 Dec. 1962 (Jančev & Stojkova 1973). – S o f i j a: Beledie Han, Komina cave [46], 4 Nov. 1956: 1 ind. (Kvartirnikov 1957, Beron 1958); – Lakatnik, cave [47], 11 Dec. 1962 (Jančev & Stojkova 1973); – Lakatnik, Răžiškata Peštera cave [48], 130 ind. (Beron 1958), 4–7 Jan. 1956: obs. colony of 120 ind. (Kvartirnikov 1957), 18 Febr. 1956: 4–5 ind. (Kvartirnikov 1957), 21 Dec. 1956: 11 ind. (Kvartirnikov 1957, Beron 1963), 16 Nov. 1957: 1m (Beron 1963), 1 Febr. 1959: 1m, 1f (Beron 1963), Suhata Peštera cave, 21 Dec. 1956 (Hanák & Josifov 1959); – Lakatnik, Svinskata Dupka cave [24], 1 Jan. 1959 (Beron 1962); – Lakatnik, Temnata Dupka cave [25], 30 ind. (Beron 1958); – Lakatnik, Zidanka cave [49], 130 ind. (Beron 1958), 31 Dec. 1957: 4m, 2 ind. (Beron 1963), 20 Dec. 1958: 4m, 1f (Beron 1963). – V e l i k o T ă r n o v o: Emen, Emenskata Peštera cave [50], summer 1984 (Ivanov 1985). – V i d i n: Dolni Lom, Desni Suhi Peč cave [51], 2 Febr. 1961 (Beron 1962); – Dolni Lom, Levi Suhi Peč cave [52], 14 July 1960: 1f (Beron 1961, 1962, 1963), 1 Febr. 1961: 1f (Beron 1963), 17 Sept. 1964 (Kolebinova 1967, Beron 1968); – Dolni Lom, Vodni Peč cave [53], 14 July 1960 (Beron 1961, 1962); – Orešec, Suhi Peč cave [54] (Beron 1964b). – V r a c a: Brusen, Dupkata (Vodnata) cave [55] (Beron 1994); – Brusen, Gornata Laka cave [56], 25 April 1964 (Beron 1973b); – Čiren, Ponora cave [57], 1958–1966: hundreds ind. (Beškov 1993, Beshkov 1998), summer 1988: 300–400 ind. (Beškov 1993, Beshkov 1998); – Kalen, Čakovska Pešt cave [58], 10 Sept. 1960 (Beron 1962); – Kunino, Samuilica cave [59], 9 Febr. 1964 (Beron 1968); – Vărbešnica, Prileparnika cave [60], 10 Sept. 1959 (Beron 1962).

DISTRIBUTIONAL STATUS (Fig. 6). *R. blasii* was recorded rather often in most parts of Bulgaria (60 localities; Tab. 11). Thus, the Balkan part of distribution range of this species comprises almost the whole country (cf. Popov & Ivanova 2002) but eastern Bulgaria (a line connecting Ruse, Kotel, and Primorsko) and northern Bulgaria (Predbalkan area) represent the margin of the European distribution area of *R. blasii* (Kryštufek & Đulić 2001). The only exception northwards is a promontory from north-western Bulgaria into south-western Romania and eastern Serbia (Kryštufek & Petrov 1989, Paunović & Stamenković 1998, Valenciuc 1993, Gheorghiu et al. 2001). Thus, the Danube and the Danubian Lowland seem to represent a natural barrier to the distribution of species in the eastern Balkans; *R. blasii* has never been recorded in the Bulgarian and Romanian Dobrogea (Červený 1982, Valenciuc 1993, Hermanns et al. 2002, own data).

In comparison with other horseshoe bats, *R. blasii* seems to be the most strict cavernicole, it inhabits karstic territories and roosts in caves and galleries. There is not a single Bulgarian record from a shelter above ground. Nursery colonies are of similar size as in the preceding species (maximum 2050 ind.), but exact data are often missing about how many horseshoe bat species have been involved. Preliminary data concerning altitudinal distribution (Pandurska 1997b) indicate the species occurrence at 0–800 m a. s. l. with a maximum of records at medium elevations of 200–500 m a. s. l. This is more or less in accordance with our data but the highest situated locality in Bulgaria is at ca. 1200 m a. s. l. (Manuilovata cave near Ribnovo). The situation in other parts of southern Europe is similar (Kryštufek & Đulić 2001), previous maximum elevation has been recorded in southern Macedonia (ca. 1000 m a. s. l., Leskoec; Kryštufek & Petrov 1989, Kryštufek et al. 1992).

Due to the possible confusion of *R. blasii* with other medium-sized horseshoe bats, namely with *R. euryale* (cf. Popov & Ivanova 2002), the numbers of individuals reported have to be considered with caution, they can either be over- or underestimated. External and cranial dimensions of examined specimens of *R. blasii* from Bulgaria are shown in Tab. 3.

Medium-sized *Rhinolophus* sp. (= *R. euryale*, *R. mehelyi*, or *R. blasii*)

RECORDS. **Original data**: K ă r d ž a l i: Ribino, Aina Ini cave, 29 Sept. 2002: obs. 3 ind. – R u s e: Beljanovo, small cave, 24 June 1967: obs. ca. 100 ind. (obs. E. Undžijan). – **Published data**: B u r g a s: Mladežko, Kaleto cave, summer visit: colony of several tens ind., winter visit: several ind. (Beškov 1993, Beshkov 1998); – Primorsko, Maslen Nos cape, summer months: ca. 500 ind. (mixed colony with *M. emarginatus*) (Beškov 1993, Beshkov 1998). – L o v e č: Složene, Ljastovicata cave, 30–40 ind. (Beškov 1993, Beshkov 1998). – M o n t a n a: Gorna Luka, Mišin Kamăk cave, April 1988: ca. 20 ind. (Beškov 1993, Beshkov 1998). – P l e v e n: Muselievo,

Nanin Kamăk cave, 1968–1989: ca. 50 ind. (Beškov 1993, Beshkov 1998); – Sadovec, Gininata Peštera cave, July 1988: ca. 50 ind. (Beškov 1993, Beshkov 1998). – R u s e: Červen, Zorovica cave, colonies (Undžijan 1998 [as *R. blasii*]); – Jantra river, cave, colonies (Undžijan 1998 [as *R. blasii*]); – Krivnja, Božkova Dupka cave, March 1989: ca. 200 ind. (Beškov 1993, Beshkov 1998); – Pepelina, Orlova Čuka cave, 5 April 1966: colony of several hundreds ind. (Undžijan 1998 [as *R. blasii*]).

Myotis myotis (Borkhausen, 1797)

Records. **Original data**: B l a g o e v g r a d: Bansko, Čalin Valog, rocky niche, 1160 m a. s. l., 9 August 2002: net. 2m; – Breznica, 25 June 1937: coll. 1 ind. juv. (NMNHS 038-5; leg. P. Drenski); – General Todorov, Pčelina hill, gallery, 23 July 1995: net. 1f (leg. J. Sádlová); – Ilindenci, Šaralijskata Peštera cave, 15 Febr. 1998: obs. 1 ind.; – Ploski, cave, 10 July 1976: obs. nurs. colony of ca. 1000 ind., coll. 3ms (NMP 49430–49432 [S+A]; cf. Hůrka 1984b, Benda & Horáček 1995), 18 July 1981: obs. colony of ca. 800 ind., net. 1fs, 17 July 1982: obs. nurs. colony of ca. 600 ind., net. 1fa, 1fj, 1mj, 3 July 1986: net. 1ma, 1fs; – Ribnovo, Manuilovata Peštera cave, 14 Febr. 1998: obs. 30 ind., 22 June 2000: net. 1ma. – B u r g a s: Mladežko, Lejarnicite cave, 25 August 1999: net. 3ma, 2fa. – D o b r i č: Tjulenovo, cave, 17 August 1983: net. 1fs. – G a b r o v o: Jantra, Prilepnata Peštera cave, 22 March 1991: obs. ca. 300 ind., 24 June 1995: obs. nurs. colony of ca. 300 ind., 27 July 1998: obs. nurs. colony of ca. 700 ind., coll. 2 subfossil ind. – H a s k o v o: Dăbovec, Arda, above stream, 30 June 1983: net. 1fa; – Knižovnik, over a brook, 21 July 1986: net. 1fa (cf. Hůrka 1997); – Madžarovo, gallery, 8 Febr. 1998: obs. 1 ind., 30 Sept. 2003: obs. 1m, 1f (leg. R. Lučan); – Spahievo, Aida hill, galleries, 14 July 1986: net. 3ma (NMP 50052–50054 [S+A]; cf. Benda & Horáček 1995, Hůrka 1997 [as *M. blythii*]). – J a m b o l: Melnica, Vodnata Drănči Dupka cave, 18 July 1998: net. 10ma, 2fa. – K ă r d ž a l i: Bjala Poljana, Manaf-Kojusju cave, 4 Jan. 1997: coll. 2 subfossil ind.; – Huhla, Ivajlovgrad dam power station, 5 July 1995: obs. 1 ind., 21 Sept. 1996: obs. 2 ind.; – Krumovgrad, Krumovica river, bridge, 3 Oct. 2003: net. 1ms (leg. R. Lučan); – Mădrec, Maarata cave, 10 Oct. 1995: obs. 1fa; – Orešari, Gouk-In cave, 8 Febr. 1998: obs. 1 ind.; – Orešari, Karangin cave, 20 Oct. 1995: net. 6ma, 11fa (cf. Ivanova 1997), 27 April 1996: net. 28fa (cf. Ivanova 1997), 17 Sept. 1996: net. 1ma, 1fa (cf. Ivanova 1997), 29 April 1997: obs. nurs. colony of ca. 1500 ind. (cf. Ivanova 1997), 14 July 1997: obs. nurs. colony (cf. Ivanova 1997), 17 May 1998: obs. nurs. colony of ca. 700 ind., 17 June 1998: obs. nurs. colony of ca. 500 ind., 20 July 1998: obs. nurs. colony of ca. 550 ind., 11 April 1999: obs. nurs. colony of ca. 1000 ind., 10 June 1999: obs. nurs. colony of ca. 700 ind., 3 July 1999: obs. nurs. colony of ca. 900 ind., 17 June 2000: obs. nurs. colony of ca. 2000 ind.; – Ribino, Aina Ini cave, 11 Oct. 1995: obs. 300 ind. (cf. Ivanova 1997), 22 Oct. 1995: obs. (cf. Ivanova 1997), 1 May 1996: obs. nurs. colony of ca. 3000 ind. (cf. Ivanova 1997), 11 June 1996: trap. 9ma, 23fa (cf. Ivanova 1997), obs. nurs. colony (cf. Ivanova 1997), 14 July 1997: obs. nurs. colony of ca. 3000 ind. (cf. Ivanova 1997), 18 Nov. 1997: obs. 20 ind. (cf. Ivanova 1997), 18 May 1998: obs. nurs. colony of ca. 1000 ind., 22 July 1998: obs. nurs. colony of ca. 250 ind., 11 Oct. 1998: obs. 20 ind., 4 July 1999: obs. nurs. colony of ca. 2000 ind., 18 June 2000: obs. nurs. colony of ca. 1000 ind., 11 Sept. 2000: net. 100 ind., 9 Sept. 2001: obs. ca. 100 ind., 29 Sept. obs. 30 ind.; – Ribino, Prilepnata Peštera cave, 2 Jan. 1997: obs. 1 ind.; – Ribino, Samara cave, 1 April 1995: obs. 15 ind. (cf. Ivanova 1997), 20 April 1995: net. 2fa (cf. Ivanova 1997), 7 July 1995: 3ma, 1mj, 1fa (cf. Ivanova 1997), 11 Oct. 1995: obs. 10 ind. (cf. Ivanova 1997), 21 Sept. 1996: net. 1ma (cf. Ivanova 1997), 2 Jan. 1997: obs. 30 ind. (cf. Ivanova 1997), 18 Nov. 1997: obs. 30 ind. (cf. Ivanova 1997), 9 Febr. 1998: obs. 40 ind., 18 May 1998: obs. 5 ind., 4 March 1999: obs. 40 ind., 30 Dec. 1999: obs. 35 ind., 29 Sept. 2002: obs. ca. 120 ind.; – Široko Pole, Karangil cave, 10 August 1995: obs. 2fa; – Visoka Poljana, Jarasă-Ini cave, 31 March 1991: obs. 800 ind., 16 Nov. 1991: obs. 100 ind., 31 March 1992: obs. 500 ind., 11 July 1995: obs. nurs. colony of ca. 8000 ind. (cf. Pandurska 1998), 12 August 1995: obs. nurs. colony of ca. 3500 ind. (cf. Pandurska 1998), 19 Oct. 1995: net. 200 ind., 6 May 1996: obs. nurs. colony of ca. 2500 ind. (cf. Pandurska 1998), 18 Sept. 1996: obs. 1500 ind., 28 April 1997: obs. nurs. colony of ca. 7000 ind. (cf. Pandurska 1998), 15 July 1997: obs. nurs. colony of ca. 10,000 ind. (cf. 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subfossil ind., 11 April 1999: obs. nurs. colony of ca. 600 ind (leg. S. Tanev), 30 April 1999: net. 2fa, obs. nurs. colony of ca. 1000 ind., 23 April 2000: obs. ca. 450 ind.; – Karlukovo, cave behind monastery, 8 August 1978: net. 3ma, 1fs (NMP 49767, 49769–49771 [S+A]; cf. Benda & Horáček 1995); – Karlukovo, cave near Prohodna, 9 August 1978: net. 2ma, 2fs (NMP 49754, 49755, 49760, 49761 [S+A]; cf. Benda & Horáček 1995); – Karlukovo, ridge above rocky amphitheatre, 15 June 1977: net. 2fa (NMP 49653, 49655 [S+A]; cf. Benda & Horáček 1995); – Karlukovo, ridge of a rocky amphitheatre, 6 August 1978: net. 1 ind.; – Karlukovo, Čerdženica cave, 6 July 1975: net. 1ma, 1fa (NMP 50245, 50246 [A]; cf. Benda & Horáček 1995), 8 July 1975: net. 1ms; – Karlukovo, Ovnarka cave, 7 July 1975: obs. 1ms; – Karlukovo, Prohodna cave, 13 June 1977: net. 1fa, 1fs (NMP 49640, 49641 [S+A]; cf. Benda & Horáček 1995), 7 August 1978: net. 1ma, 1fs (NMP 49744, 49745 [S+A]; cf. 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Hůrka 1984a, Benda & Horáček 1995); – Peštera, Snežanka cave, 5 Febr. 1965: coll. 3fa, 2fs (NMP 50075–50079 [S+B], IVB 127 [S+B]; cf. Hůrka 1984a, Benda & Horáček 1995); – Peštera, Vodnata Peštera cave, 30 Nov. 1991: obs. 20 ind., 2 March 1992: obs. 1ma, 2fa; – Velingrad, Lepenica cave, 9 July 1981: net. 1faL. – P l e v e n: Devenci, Hajduška Peštera cave, 7 July 1975: net. 1ma, 4fa (coll. 1m, 1f, NMP 50262, 50273 [A]), 14 June 1977: net. 4ma, 1fa (NMP 49642–49646 [S+A]; cf. Benda & Horáček 1995); – Muselievo, over Osăm river, 8 June 2001: net. 1ma; – Rakita, Sedlarkata cave, 14 May 1998: net. 1 ind., 18 July 2001: net. 2ma. – P l o v d i v: Bačkovo, Bačkovski monastery, 21 July 1979: coll. 1ma (NMP 49801 [S+A]; cf. Benda & Horáček 1995); – Dobrostan, Ahmet'ova Dupka cave, 28 Dec. 1999: obs. 6 ind.; – Dobrostan, Marciganica, Ivanova Voda cave, 23 July 1979: obs. nurs. colony (coll. 2ma, 1ms, 1fa, NMP 49785, 49802, 49803, 49805 [S+A]; cf. Benda & Horáček 1995), 12 July 1982: obs. past colony (skeletons), 20 Febr. 1997: obs. ca. 6500 ind. (coll. 1m, 1f; NMNHS 101, 102), 20 May 1998: obs. nurs. colony of ca 400 ind., 24 July 1998: net. 2ma, 2mj, 21faL, 5fj, obs. nurs. colony of ca. 500 ind., 27 June 2000: obs. nurs. colony of ca. 500 ind.; – Kalofer, Raj hut, Han Maara cave, 17 August 1997: net. 1m (cf. Ivanova 1998, Beron et al. 2000a); – Kărnare, Mazata cave, 25 Sept. 1997: obs. 1f, net. 2m (cf. Ivanova 1998), 3 Nov. 1997: obs. 4 ind. (leg. P. Beron & V. Beškov, cf. Ivanova 1998, Beron et al. 2000a). – R u s e: Beljanovo, small gallery, 29 July 1998: obs. 1ma, 1fa; – Krasen, Găbarnika cave, 28 July 1998: obs. nurs. colony of ca. 200 ind., 13 June 2000: obs. nurs. colony of ca. 200 ind.; – Pepelina, Orlova Čuka cave, 31 May 1990: obs. nurs. colony of ca. 50 ind. (cf. Pandurska 1998), 16 Oct. 1993: coll. 4 subfossil ind. (NMNHS), 2 July 1996: obs. nurs. colony of ca. 2000 ind. (exam. 1fa, 1mj; cf. Pandurska 1998). – S i l i s t r a: Onogur, Ergele Peštera cave, 20 April 2001: net. 2fa; – Vojnovo, Malkata Badžalija cave, 16 April 1999: net. 2ma, 3fa, 5 Oct. 1999: net. 2mj. – S l i v e n: Kotel, Nirica cave (8 km W of the town), 15 July 1979: obs. colony ca. 3000 ind. (34fa, 1fs, 7mj, 9fj); – Kotel, Zelenič, Orlovata Peštera cave, 4 May 1980: obs. nurs. colony of 13ma, 57fa (leg. V. Vasilev); – Kotel, Zlosten, Lednicata cave, 26 Febr. 1997: obs. ca. 2000 ind., 5 July 2000: obs. nurs. colony of ca. 5000 ind.; – Sliven, galleries, 12 August 1983: net. 1ma; – Tvărdica, Măglivijat Snjag cave, 26 Sept. 1996: net. 6 ind. (cf. Ivanova 1998). – S m o l j a n: Borikovo, Borikovskata cave, 1 Jan. 2003: obs. 40 ind.; – Čepelare, Samurski Dupki cave, 7 August 1971: net. 1fs (NMP 47/72/C42 [S+B]; cf. Horáček et al. 1971, 1974, Benda & Horáček 1995); – Gela, Ledenica cave, 1650 m a. s. l., 13 August 1978: net. 1 ind.; – Gela, Ledenica cave, 31 July 1971: net. 4ma, 2fs (cf. Horáček et al. 1971, 1974); – Jagodina, Dolna Karanska Dupka cave, 16 August 1978: net. 1ma; – Jagodina, Imamova (= Jagodinskata) cave, 2 August 1971: net. 1ma, 1fs (coll. 1ma, NMP 47/72/C31 [S+B]; cf. Horáček et al. 1971, 1974, Benda & Horáček 1995), 15 August 1978: net. 1m (cf. Benda & Horáček 1995); – Jagodina, Sančova Dupka cave, 3 August 1971: net. 1ma (cf. Horáček et al. 1971, 1974); – Mogilica, Uhlovica cave, 20 July 1996: net. 1ma, 31 Dec. 2002: obs. 21 ind.; – Orehovo, cave 100 m W of the village, 28 June 1984: net. 1ma (leg. T. Scholz & D. Král), 30 June 1984: net. 1ma (leg. T. Scholz & D. Král). – S o f i j a: Borovec, 1350 m, building, 22 July 1929: coll. 1fj

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(NMNHS; leg. I. Bureš). – Š u m e n: Divdjadovo, Zandana cave (Divdjadovski), 29 June 1995: obs. nurs. colony, coll. 1mj (NMNHS 0039; cf. Ivanova 2001), 28 Sept. 1996: coll. 1 subfossil ind.; – Madara, cave in the rocky wall (Hiljadite Očički), 28 June 1995: obs. 2fa (cf. Ivanova 2001). – T ă r g o v i š t e: Prolaz, Derventskata Peštera cave, 14 Jan. 1991: obs. 1 ind., 4 Oct. 1996: coll. 1 subfossil ind. (NMNHS), 2 July 2000: obs. nurs. colony of ca. 3500 ind. (cf. Ivanova 2001), coll. 1 subfossil ind.; – Tărgovište, Marina Dupka cave, 3 July 2000: obs. nurs. colony of ca. 1000 ind. (cf. Ivanova 2001). – V a r n a: Bălgarevo, Tjulenovata Peštera cave, 14 August 2003: obs. nursery colony of ca. 300 ind.; – Beloslav, Temnata Dupka cave, 9 Sept. 1962: coll. 1ma (IVB 71 [S+B]). – V e l i k o T ă r n o v o: Emen, Emenskata Peštera cave, 10 Oct. 1996: coll. 1 subfossil ind. (NMNHS), 19 April 2000: obs. 2 ind. – V i d i n: Car Petrovo, Vărkan cave, 27 Febr. 2000: obs. 3 ind.; – Gorni Lom, Desni Suhi Peč cave, 25 Febr. 2000: obs. 20 ind., 19 July 2000: obs. 60 ind.; – Kračimir, Kračimirsko Vrelo cave, 26 Febr. 2000: obs. 1 ind.; – Orešec, Peč cave (Suhi Peč), 24 Febr. 1995: coll. 1 subfossil ind. (NMNHS), 20 Febr. 1998: obs. 10 ind. (leg. R. Pandurska), 26 Febr. 2000: obs. 2 ind.; – Rabiša, Magura cave, 27 July 1948: coll. 1mj (NMNHS 201; leg. P. Drenski). – V r a c a: Čiren, Ponora cave, 24 March 1991: obs. ca. 200 ind., 22 April 1995: obs. colony of ca. 1000 ind.; – Kalen, Kalenskata Peštera cave, 8 March 1998: obs. 15 ind., 22 April 2000: obs. nurs. colony of ca. 2500 ind., coll. 1 subfossil ind. (leg. N. Simov); – Kunino, Čeloveča Dupka (Čeloveči Dol) cave, 1 May 1993: obs. 1ma, 2fa; – Kunino, Vasilica cave, 25 June 1929: coll. 2mj (NMNHS 038-1, 038-2; leg. L. Bozero); – Ljutibrod, Gara Čerepiš, Serapionovata Peštera cave, 11 May 1994: coll. 1ma (NMNHS), 10 Jan. 1999: obs. 23 ind.; – Zgorigrad, Ledenika cave, 22 May 1994: coll. 1 ind. (NMNHS; leg. P. Beron); – Zgorigrad, Părševiška Jama cave, 28 Nov. 1999: coll. 1 subfossil ind. (leg. N. Simov). – Bulgaria undef.: a cave in the Rodopi Mts., 24 Oct. 1954: 1 ind. (ZIN; leg. J. Gorelov); – Bulgaria undef., 14 Oct. 1956: coll. 1ma (NMP 50141 [S+B]; cf. Benda & Horáček 1995). – **Published data**: B l a g o e v g r a d: Leško, cave, 4–5 Oct. 1995: net. 10 ind. (Pandurska & Beshkov 1998b), 8 June 1996: net. 5 ind. (Pandurska & Beshkov 1998b). – B u r g a s: Karamlek [= Karamlăk = Mladežko], Stranjabalkan [= Strandža Mts.], 23 July 1935 (Hopkins & Rotschild 1956); – Primorsko, Južna Podmolna Peštera cave (Pandurska 1998); – Strandža Planina Mts., 1959 (Paspalev & Markov 1961). – G a b r o v o: Jantra, Prilepnata Peštera cave, May 1989: nurs. colony of ca. 5600 ind. (Beškov 1993, Beshkov 1998, cf. Pandurska 1998). – J a m b o l: Elhovo, monastery, 12 April 1931 [NMNHS] (Hanák & Josifov 1959); – Melnica, Vodnata Drănči Dupka cave, March 1971: several hundreds ind. (Beškov 1993, Beshkov 1998, cf. Pandurska 1998). – K j u s t e n d i l: Rilski Manastir, Kirilova Poljana, gallery, 1500 m a. s. l. (Beron et al. 2000b); – Vetren, Goljamata cave, 8–9 June 1996: obs. colony of hundreds of bats (Pandurska & Beshkov 1998b). – L o v e č: Bežanovo, Parnicite cave, May 1990 – Sept. 1991: nurs. colony of ca. 1500 ind. (Pandurska 1998), two visits in summer season: ca.700–800 ind. and ca. 2700–2800 ind. (mixed colony with *M. blythii*) (Beškov 1993, Beshkov 1998); – Brestnica, Săeva Dupka cave (Beron & Guéorguiev 1967); – Čavdarci, Mandrata cave, nurs. colony (Pandurska 1998); – Devetaki, Devetaškata Peštera cave, 4 June 1994: 2500 fa (Pandurska 1998), May–June 1997: mixed colony (with *M. blythii* and *M. capaccinii*) (Pandurska 1999, Pandurska & Paunović 1997); – Gložene, Ljastovicata cave, nurs. colony (Pandurska 1998, cf. Beškov 1993, Beshkov 1998); – Gložene, Morovica cave, net. (Beškov 1993, Beshkov 1998), nurs. colony (Pandurska 1998); – Goljama Željazna, Toplja cave, Oct. 1989: several ind. (Beškov 1993, Beshkov 1998, cf. Pandurska 1998); – Gradešnik, cave [= Gradežnica, Gradežniškata Peštera (= Krušovata Peštera) cave], 9 August 1987: colony of ca. 1500 ind. (Grimmberger 1993); – Karlukovo, Troevratica cave, summer 1992: 2 ind. (Popov & Ivanova 1995), spring 1993: 1 ind. (Popov & Ivanova 1995); – Karlukovo, Zadănen Dol, near Prohodna cave, summer 1988: 1 ind. (Popov & Ivanova 1995), summer 1989: 3 ind. (Popov & Ivanova 1995), summer 1990: 1 ind. (Popov & Ivanova 1995), summer 1991: 4 ind. (Popov & Ivanova 1995), summer 1992: 2 ind. (Popov & Ivanova 1995), spring 1993: 1 ind. (Popov & Ivanova 1995); – Kărpačevo, Fut'ovskata Peštera cave, 24 July 1959 (Beron 1962), 11 Sept. 1960: 1f (Beron 1963); – Krušuna, Uruška Maara cave, 24 July 1959: large colony (Beron 1961, 1962), 10 Sept. 1960: 1f (Beron 1963); – Mikre, Goljamata Peštera cave, 27 Jan. 1960 (Beron 1962); – Zlatna Panega, Dolnata Peštera cave, 28 Febr. 1960 (Beron 1961), 23 Oct. 1966 (Beron 1968, Jančev & Stojkova 1973). – M o n t a n a: Čerkaski, Grimnena Dupka cave, 29 Oct. 1971 (Beron 1972); – Gorna Bela Rečka, 1991–1998 (Pandurska & Beshkov 1998a); – Gorna Luka, Mišin Kamăk cave, 29 Jan. 1961 (Beron 1962), 1991–1998 [20 Febr. 1998: obs. 5 ind.] (Pandurska & Beshkov 1998a); – Gorna Luka, Peč cave, 1991–

1998 (Pandurska & Beshkov 1998a); – Prevala, Vreloto cave, 17 Sept. 1964 (Beron & Guéorguiev 1967). – P a z a r d ž i k: Gabrovica, Golak, Golaškata Peštera mine (Bureš 1917, Kovačev 1925, Martino 1955, Beškov 1962), 8 Nov. 1940: 4m, 5f (Bureš 1941, 1942), 31 March 1964 (Beron 1968, Kolebinova & Beron 1965), 1 April 1964 (Jančev & Stojkova 1973), 16–17 June 1991: 600 ind. (Pandurska 1998); – Peštera, cave (Drenski 1955); – Peštera, Jubilejna cave, 7 March 1992: 1 ind. (Pandurska & Beshkov 1998b); – Peštera, Snežanka cave, 3 Jan. 1961 (Markov & Džambazov 1962), 1 ind. (Pandurska & Beshkov 1998b); – Velingrad, Lepenica cave, 24 Dec. 1960 (Beron 1962), 17 Dec. 1961: 2 ind. (Beškov & Beron 1962), 6 Oct. 1994: 4 ind. (Pandurska & Beshkov 1998b). – P e r n i k: Bosnek, Duhlata cave (Beron 1958); – Krapec, Živata cave, 26 Dec. 1993 (Pandurska & Beshkov 1998b); – Ljulin, 12 June 1930 [NMNHS] (Hanák & Josifov 1959); – Studena, gallery, 17 Febr. 1996 (Pandurska & Beshkov 1998b). – P l e v e n: Devenci, Hajduška Peštera cave, nurs. colony (Pandurska 1998), May–June 1997: mixed colony (with *M. blythii* and *M. capaccinii*) (Pandurska & Paunović 1997, Pandurska 2003); – Muselievo, Nanin Kamăk cave, 9 August 1971 (Beron 1972, 1973a, b, 1974b); – Pleven, Golemata Peštera [= Kajaläškata Peštera] cave, 12 Oct. 1914: obs. many ind., coll. 1f (Bureš 1917, Kovačev 1925); – Rakita, Sedlarkata cave, nurs. colony (Pandurska 1998); – Sadovec, Genina [= Gininata] Peštera cave, 11 Sept. 1968 (Beron 1970). – P l o v d i v: Asenovgrad, Asenova Krepost fortress, 6 June 1957 [NMNHS] (Hanák & Josifov 1959); – Plovdiv, under bridge near the town, 1935: 8 ind. 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Beškov 1993, Beshkov 1998), 21 May 1968 (Jančev & Stojkova 1973); – Kotel, Ovčata cave, 23 Sept. 1977: 1m (Nowosad et al. 1987); – Kotel, Temnata Dupka cave, 10 April 1975: 1m (Nowosad et al. 1987). – S m o l j a n: Borikovo, Červenata [= Borikovskata] Dupka cave, 2 April 1967 (Beron 1968, Jančev & Stojkova 1973); – Gela, Ledenica cave, 10 March 1991: 12 ind. (Pandurska & Beshkov 1998b). – S o f i j a: Beledie Han, cave (Kvartirnikov 1956, Beron 1958); – Bov, Izdrimec peak, 1991–1998 (Pandurska & Beshkov 1998a); – Breze, Travninata cave, 1991–1998 (Pandurska & Beshkov 1998a); – Cerovo, Vodnata Peštera cave, 5 Nov. 1940: 4 ind. (Bureš 1941), May–June 1997: mixed colony (with *M. blythii* and *M. capaccinii*) (Pandurska & Paunović 1997), 1991–1998 (Pandurska & Beshkov 1998a); – Druževo, Razsovatata Jama cave, 1 and 2 Febr. 1958: 5 ind. (Beron 1958); – Gara Kurilo, Kătina, gallery, 30 Jan. 1914: 1m (Bureš 1917, Kovačev 1925); – Ginci, Dinevata Pešt cave, 5 Febr. 1959 (Beron 1962), 1991–1998 (Pandurska & Beshkov 1998a), nettings 1990–1994: 10 ind. (Pandurska et al. 1999); – Ginci, Podmola cave, 6 Febr. 1959 (Beron 1962); – Ginci, Svetata Voda cave, 1991–1998 (Pandurska & Beshkov 1998a); – Ginci, four caves, winter cesus 1991–1994: 5 ind. (Pandurska et al. 1999); – Iskrec, [Dušnika] cave, May 1911 (Bureš 1917, Kovačev 1925), 1991–1998 (Pandurska & Beshkov 1998a); – Jana, 17 April 1962: 1m (Beron 1963); – Kokaljane, Urvič, galleries, 3 Sept. 1957: 1m, 1f (Beron 1963), 15 Sept. 1957: 1m (Beron 1958, 1963), 20 Oct. 1957: 2m, 2f (Beron 1958, 1963), 3 Nov. 1957: 2m, 1f (Beron 1963), 8 Nov. 1957: 1m (Beron 1963), 8 May 1958: 1m (Beron 1958, 1963), 6 Sept. 1958: 2m, 2f (Beron 1963), 1 Oct. 1958: 1f (Beron 1963), 11 Sept. 1959: 1f (Beron 1963), 16 Oct. 1960: 1f (Beron 1963), 24 Jan. 1961: 1f (Beron 1963), 13 Oct. 1963 (Beron & Kolebinova 1964); – Komštica, Goljamata Balabanova cave, 1991–1998 (Pandurska & Beshkov 1998a); – Lakatnik, cave (Beron 1973a), 1 Sept. 1924 (Karaman 1939), 1 Oct. 1924 (Karaman 1939), 21 May 1961 (Jančev & Stojkova 1973); – Lakatnik, Goljama Vraža Dupka cave, 1991–1998 (Pandurska & Beshkov 1998a); – Lakatnik, Javoreckata Peštera cave, July 1948 (Beron 1962), 1991–1998 (Pandurska & Beshkov 1998a); – Lakatnik, Răžiškata Peštera cave (Beron & Guéorguiev 1967); – Lakatnik, Svinskata Dupka cave (Kvartirnikov 1956), 24 Jan. 1955 [NMNHS] (Hanák & Josifov 1959), 1991–1998 (Pandurska & Beshkov 1998a); – Lakatnik, Vražite Dupki cave (Kvartirnikov 1956); – Lipnica, Kozarnika cave, 1991–1998 (Pandurska & Beshkov 1998a); – Milanovo, Čavkite cave, 22–23 Nov. 1958: 13 ind. (Mičev & Beškov 1959); – Sofija, 20 July 1917 (Karaman 1939), 14 May 1932 [NMNHS] (Hanák & Josifov 1959), 20 July 1937 (Karaman 1939); – Zimevica, Elata cave, 4 Dec. 1960: 1m (Beron 1963), 1991–1998 (Pandurska & Beshkov 1998a); – S t a r a Z a g o r a: Kazanlăk (Kovačev 1925). – Š u m e n: Madara, Madarska Peštera cave, nurs. colony (Pandurska 1998); – Preslav, Hiža Patlejna hut, Meča Dupka cave, 14 Sept. 1988: several ind. (Beškov et al. 1994); – Šumen, Labirinta cave, 1 ind. (mummy) (Beškov et al. 1994). – V e l i k o T ă r n o v o: Beljakovec, Goljama Podlisca cave, 24 May 1924: many ind. (Bureš 1926); – Emen, Emenska Peštera cave, nurs. colony (Pandurska 1998), May–June 1997: mixed colony (with *M. blythii* and *M. capaccinii*) (Pandurska & Paunović 1997). – V i d i n: Belogradčik, Gornata Propast chasm, 6 Febr. 1960 (Beron 1962); – Belogradčik, Hajduškata Propast chasm, 7 Febr. 1960 (Beron 1962); – Dolni Lom, Desni Suhi Peč cave, 1991–1998 (Pandurska & Beshkov 1998a); – Dolni Lom, Levi Suhi Peč cave, 2 Febr. 1961: 1m (Beron 1962, Beškov & Beron 1962); – Dolni Lom, Vodni Peč cave, 14 July 1960 (Beron 1962); – Falkovec, Falkovskata Peštera cave, 18 Oct. 1971

(Beron 1972); – Orešec, Propast chasm, 20 Oct. 1971 (Beron 1972); – Orešec, Suhi Peč cave, 14 July 1960 (Beron 1962), 1991–1998 (Pandurska & Beshkov 1998a); – Rabiša, Magura cave, July 1948 (Beron 1962); – Vojnica, Studena cave, 19 Oct. 1969 (Beron 1972). – V r a c a: Čiren, Ponora cave, 26 Oct. 1960: 4–5 ind. (Beron 1961, 1962), summer 1988: colony of ca. 900 ind. (Beškov 1993, Beshkov 1998, cf. Pandurska 1998); – Drašan, Drašanskata Peštera cave, 22 Jan. 1966 (Beron & Guéorguiev 1967); – Glavaci, Kalna Mătnica cave, 1991–1998 (Pandurska & Beshkov 1998a), nurs. colony (Pandurska 1998); – Kalen, Kalenska Pešt cave, 8 Sept. 1959 (Beron 1962); – Liljače, Božija Most cave, 10 July 1986: net. 1m (Grimmberger 1993), nurs. colony (Pandurska 1998); – Liljače, Prilepnata Peštera cave, 7 July 1960 (Beron 1961); – Ljutadžik, Sokolskata Dupka cave, 6 Febr. 1967 (Beron 1968, Jančev & Stojkova 1973); – Ljutibrod, Gara Čerepiš, Serapionovata Peštera cave, summer visit: ca. 60 ind. (Beškov 1993, Beshkov 1998), winter visit: 21 ind. (Beškov 1993, Beshkov 1998), 1 May 1960 (Beron 1962), 6 July 1960: ca. 1000 ind. (Beron 1964b), 21 March 1963 (Jančev & Stojkova 1973), 5 July 1991 and 25 July 1992: 1500 ind. (Pandurska 1998), 1991–1998 (Pandurska & Beshkov 1998a); – Okolčica, Bezimenna cave, 1991–1998 (Pandurska & Beshkov 1998a); – Vraca, Lednica [= Ledenika] cave, 30 March 1915 (Bureš 1917, Kovačev 1925, Beron 1962). – Bulgaria undef.: Dubroviška cave, 1985: 1f (Belcheva et al. 1992).

DISTRIBUTIONAL STATUS (Fig. 7). In number of records (184 localities; Tab. 11), *M. myotis* is the most frequently found vespertilionid and the third most frequently found bat species in Bulgaria. It seems to be quite abundant over whole the country though a peak of its abundance is in karst regions rich in spacious caves. In contrast to Greece and Turkish Thrace (Benda & Horáček 1998, Hanák et al. 2001), where *M. blythii* overnumerates *M. myotis*, in Bulgaria *M. myotis* was recorded more frequently than *M. blythii* (the number of localities with *M. myotis* is about 1/3 higher than in *M. blythii*, see Tab. 11). The same is pertinent also for other regions situated either at the same latitude as Bulgaria or north of it, namelly for Macedonia and Albania (Kryštufek et al. 1992, Uhrin et al. 1996a) and Romania (Valenciuc 1994, Gheorghiu et al. 2001).

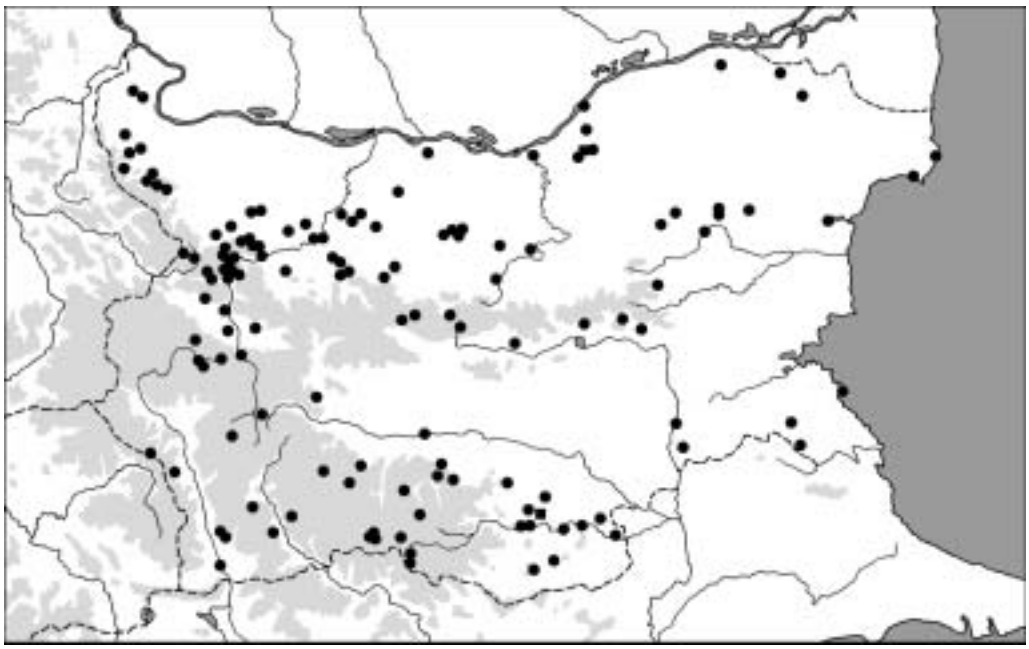

Fig. 7. Records of *Myotis myotis* (Borkhausen, 1797) in Bulgaria. Explanation of symbols as in Fig. 3.

Tab. 4. Basic biometric data for examined Bulgarian samples of *Myotis myotis* (Borkhausen, 1797), *M. blythii* (Tomes, 1857), and *M. bechsteinii* (Kuhl, 1817). For abbreviations see p. 250

	Myotis myotis					*Myotis blythii*					*Myotis bechsteinii*				
	n	min	max	M	SD	n	min	max	M	SD	n	min	max	M	SD
LC	77	68.0	82.0	74.4	2.894	28	52.0	76.0	68.5	5.182	13	43.0	54.0	48.5	3.017
LCd	77	48.0	64.0	56.8	2.889	26	54.0	66.0	60.0	3.092	13	43.0	53.0	45.7	2.626
LAt	79	58.0	66.3	61.6	1.945	36	54.8	63.0	58.1	1.991	13	41.1	47.5	43.6	2.093
LA	79	23.0	31.5	26.4	1.384	37	19.5	26.0	23.0	1.433	13	22.0	26.0	24.3	1.148
LTr	77	9.4	15.8	12.9	1.361	35	8.4	13.0	11.2	1.173	13	10.5	13.0	12.1	0.795
G	70	20.0	36.0	25.7	3.255	36	17.5	32.0	24.4	4.290	10	5.5	10.0	8.5	1.335
LCr	70	22.72	24.95	23.88	0.481	31	20.57	22.05	21.42	0.405	12	16.88	17.97	17.47	0.392
LCb	67	21.77	23.42	22.68	0.418	30	19.55	20.97	20.29	0.397	12	15.57	16.70	16.25	0.343
LaZ	65	14.05	15.75	15.10	0.327	23	12.87	14.19	13.63	0.317	12	9.92	10.58	10.31	0.197
LaI	71	4.83	5.65	5.15	0.162	35	4.75	5.43	5.06	0.170	12	4.01	4.25	4.11	0.077
LaN	72	9.47	10.61	10.03	0.235	32	9.38	10.22	9.64	0.206	12	7.57	8.18	7.86	0.178
AN	72	7.37	8.70	8.13	0.247	29	7.13	8.05	7.56	0.244	12	5.67	6.16	5.85	0.132
CC	71	5.35	6.55	6.21	0.211	37	5.22	6.17	5.67	0.209	12	3.92	4.21	4.06	0.075
M^3M^3	68	9.28	10.38	9.86	0.270	36	8.05	9.27	8.78	0.302	12	6.69	7.12	6.91	0.136
CM^3	71	9.52	10.42	10.03	0.210	38	8.06	9.13	8.74	0.268	12	6.72	7.23	6.95	0.147
LMd	72	17.32	18.87	18.14	0.353	39	15.30	17.15	16.18	0.376	12	11.98	13.08	12.60	0.345
ACo	72	5.50	6.80	6.21	0.233	36	4.65	5.92	5.14	0.248	12	3.75	4.98	4.13	0.352
CM_3	72	10.33	11.90	10.82	0.239	39	8.85	9.80	9.46	0.233	12	4.43	7.61	7.14	0.863

The records of underground roosts (caves and man made underground spaces) form a vast majority of data, the records from the roosts above ground (buildings, under bridges, etc.) and the mist netting captures are less frequent. Besides of numerous records of individual bats, a large number of nursery colonies were found varying in size from tens to several hundreds and even thousands of individuals (maximum up to 8000 ind., see Pandurska 1998), often appearing in joint clusters with some other species (mostly *M. blythii* and *M. capaccinii*). Winter records are less frequent and mostly concern solitary bats or small groups. *M. myotis* is nearly a strict cave-dweller in Bulgaria with all its breeding colonies in underground quarters (cf. Pandurska 1998). Such a roosting preference, common around the Mediterranean, clearly differ from the situation in northern regions of Europe and probably terminates just in Bulgaria (Horáček 1984). The altitudinal range of the Bulgarian records of *M. myotis* is from the sea level up to 1700 m a. s. l. in all Bulgarian mountain systems. Most of records, however, come from the karst region of medium altitudes. External and cranial dimensions of examined specimens of *M. myotis* from Bulgaria are shown in Tab. 4.

Myotis blythii (Tomes, 1857)

Records. **Original data**: B l a g o e v g r a d: Bansko, Čalin Valog [1], rocky niche, 1160 m a. s. l., 9 August 2002: net. 4m, 1f; – Bansko, Vihrenskata Propast chasm [2], 30 August 1972: coll. 1 subfossil ind. (NMNHS; leg. P. Beron); – General Todorov, Pčelina hill [3], gallery, 4 August 1994: net. 1ma (NMP 50398 [A]), 11 August 1994: net. 1ma (NMP 50404 [A]); – Kresna, Šejtan Dere [4], 2 July 1995: net. 1ma (NMNHS; cf. Petrov 2001), 16 August 1995: net. 1ma (NMNHS; cf. Petrov 2001); – Ploski [5], orchard, 14 August 1987: net. 1ma (NMP 50063 [S+B]); – Razlog, Meča Dupka cave [6], 30 August 1980: net. 3m, 1f; – Razlog, Propadnalata Peštera cave [7], 19 July 1982: net. 2ma, 1ms. – B u r g a s: Černomorec, Nos Atija cape [8], abri, 12 July 1987: 3m, 2f; – Černomorec, gallery n. town [9], 16 July 1987: net. 1m, 3f; – Mladežko, Lejarnicite cave [10], 11 July 1958: net. 2ma (coll. 1m, NMP 50204 [A]; cf. Hůrka 1962, Benda & Horáček 1995), 25 August 1999: net. 3mj, 4fa, 1fj; – Primorsko, Maslen Nos cape [11], cave, 5 June 1957: obs. large colony, coll. 3ma, 1mj, 15fa (NMP 49184, 48185, 48187, 48188, 49202–49204, 49212, 49213, 49215–49219, 49225, 49230, 49342, 49345 [S+A], 50200 [A]; cf. Hůrka 1958, Hanák & Josifov 1959, Benda & Horáček 1995), 27 August 1961: coll. 1ma, 2fs

(NMP 49704, 49705 [S+B], 49706 [B]; cf. Benda & Horáček 1995); – Primorsko, Maslen Nos cape, Tjulenovata Peštera cave [12], 17 August 1999: net. 1mj, obs. nurs. colony; – Primorsko, Perla [13], abandoned building, 23 July 2001: obs. 1ma. – D o b r i č: Kamen Brjag, cave 1 km NE of the town [14], 11 July 1986: net. 2ma (NMP 50047, 50048 [S+A]; cf. Benda & Horáček 1995, Hůrka 1997); – Kavarna [15], cave near sea, 11 Sept. 1962: coll. 2ma (IVB 7, 8 [S+B]; cf. Gaisler & Hanák 1964); – Tjulenovo [16], cave, 17 August 1983: net. 4ma, 4ms, 2fa, 5fs. – G a b r o v o: Skalsko [17], Rosica river, bridge, 24 June 1995: obs. 1ma. – J a m b o l: Melnica, Vodnata Drănči Dupka cave [18], 18 July 1998: net. 5ma, 1fa; – Ustrem, cave near the monastery Sveta Troica [19], 12 April 1931: coll. 1ma (NMNHS 199; leg. N. Radev). – L o v e č: Aprilci, Pleven hut, Vodnite Dupki cave [20], 24 July 1982: coll. 2 subfossil ind. (NMNHS, leg. P. Beron), 24 May 1999: coll. 3 subfossil ind., 29 Jan. 2001: coll. 3 subfossil ind.; – Bežanovo, Parnicite cave [21], 28 Jan. 1998: coll. 1ma (NMNHS 134); – Devetaki, Devetaškata Peštera cave [22], 20 May 1999: net. 3fa (leg. C. Dietz), 7 June 2001: coll. 1fa (NMNHS 173); – Černi Osam, Rajčova Dupka cave [23], 13 August 1997: coll. 1 subfossil ind.; – Karlukovo, cave behind monastery [24], 8 August 1978: net. 1ma; – Karlukovo, ridge above rocky amphitheatre [25], 6 July 1976: net. 1ma, 1faL (NMP 49364, 49365 [S+A]; cf. Hůrka 1984a, Benda & Horáček 1995), 12 June 1977: net. 1ma (NMP 49436 [S+A]; cf. Benda & Horáček 1995), 15 June 1977: net. 1ma (NMP 49654 [S+A]; cf. Benda & Horáček 1995); – Karlukovo, small cave near Prohodna [26], 9 August 1978: net. 1ma, 2fj (cf. Benda & Horáček 1995); – Krušuna, Boninskata Peštera cave [27], 22 May 1994: coll. 2 subfossil ind.; – Krušuna, Uruška Maara cave [28], 21 May 1994: net. 6ma, obs. nurs. colony. – P a z a r d ž i k: Peštera, Novata Peštera cave [29], 11 July 1981: net. 1ma; – Velingrad, a cave ca. 400 m above Lepenica cave [30], 9 July 1981: net. 1ma. – P l e v e n: Devenci, Hajduška Peštera cave [31], 7 July 1975: net. 1fa (NMP 50272 [A]); – Muselievo, niche in the rocks [32], 9 June 2001: net. 2ma; – Rakita, Sedlarkata cave [33], 14 May 1998: net. 1ma, 5fa, 18 July 2001: net. 1ma. – P l o v d i v: Dobrostan, Ivanova Voda cave [34], 20 Febr. 1997: coll. 2 subfossil ind. (NMNHS), 24 July 1998: net. 2 faL, obs. nurs. colony; – Plovdiv [35], 1836?, 1 ind. (NMW 18810; don. Ritter von Friedrichstal). – S i l i s t r a: Onogur, Ergele Peštera cave [36], 20 April 2001: net. 4ma, 4fa; – Vojnovo, Malkata Badžalija cave [37], 5 Oct. 1999: net. 2fj, 2 ind. – S l i v e n: Kotel, Nirica cave (8 km W of the town) [38], 15 July 1979: net. 1fa; – Kotel, Zelenič, Orlovata Peštera cave [39], 4 July 2000: obs. 1ma; – Sliven [40], galleries, 10 June 1982: coll. 1ma (NMP 40920 [S+B]; cf. Benda & Horáček 1995), 12 August 1983: net. 4ma; – Sliven, Zmejovi Dupki cave [41], 13 July 1979: net. 2ma (NMP 49791, 49792 [S+A]; cf. Benda & Horáček 1995). – S m o l j a n: Gela, small cave n. village [42], 12 August 1978: net. 1ma; – Gela, Ledenica cave [43], 1650 m a. s. l., 31 July 1971: net. 3ma, 2fa, 4fs (coll. 1ma, NMP 47/72/C19 [S+B]; cf. Horáček et al. 1971, 1974, Benda & Horáček 1995), 13 August 1978: net. 2ma, 1faNL; – Jagodina, Dolna Karanska Dupka cave [44], 16 August 1978: net. 1fa; – Jagodina, Imamova (= Jagodinska) cave [45], brook, 15 August 1978: net. 1fa; – Jagodina, Sančova Dupka cave [46], 2 August 1971: coll. 1 recent skeleton (cf. Horáček et al. 1971, 1974); – Orehovo, cave 100 m W of the village [47], 28 June 1984: net. 1ma (NMP 50045 [S+A]; leg. T. Scholz & D. Král, cf. Benda & Horáček 1995); – Orehovo, cave in a quarry [48], 24 August 1980: net. 2m, obs. 1ma, 1fa, 25 August 1980: net. 1ma. – S o f i j a: Lakatnik, Suhata (= Răžiškata) Peštera cave [49], 3 Jan. 1962: coll. 1 ind. (NMP 49828 [S]; leg. J. Sklenář); – Lakatnik, Temnata Dupka cave [50], 9 July 1982: net. 1ma. – S t a r a Z a g o r a: Tăža, Dždendema reserve [51], small caves, 29 August 1997: net. 1 ind. (cf. Ivanova 1998, Beron et al. 2000a). – Š u m e n: Divdjadovo, Zandana cave (Divdjadovski) [52], 29 May 1995: coll. 1 subfossil ind. (NMNHS; cf. Ivanova 2001). – V a r n a: Beloslav [53], 4 Sept. 1966: coll. 1ma (NMP 40692 [S+B], leg. B. Pražan; cf. Benda & Horáček 1995); – Komunari [54], rocky labyrinth NE of the town, 12 July 1979: net. 1ms (NMP 49790 [S+A]; cf. Benda & Horáček 1995). – V i d i n: Orešec, Suhi Peč cave [55], 24 Febr. 1995: coll. 2 subadult ind. (NMNHS). – V r a c a: Beli Izvor, Kalna Mătnica (Toškova Dupka) cave [56], 12 June 1994: coll. 1 subfossil ind. (NMNHS); – Kunino, Čeloveča Dupka cave (Čeloveči Dol) [57], 1 May 1993: obs. 1ma; – Ljutibrod, Gara Čerepiš, Serapionovata Peštera cave [58], 15 June 1994: coll. 1fa (NMNHS), 11 May 1995: coll. 1fa (NMNHS). – **Published data**: B l a g o e v g r a d: Gorno Osenovo [59], artificial tunnel, 848 m a. s. l (Beron et al. 2000b); – Leško [60], cave, 4–5 Oct. 1995: net. 3 ind. (Pandurska & Beshkov 1998b). – B u r g a s: Lozen [?= Lozenec] [61], small cave, colony of ca. 2000 ind. (mixed with *M. schreibersii*) (Kvartirnikov 1956); – Primorsko, Maslen Nos cape [10], cave (Kvartirnikov 1956, Beron 1958); – Strandja-Balkan [= Strandža Mts.], rocky cave, 1935: several ind. [= Mladežko, cave, 2 August 1935: coll. 1ma, NMNHS] [62] (Heinrich 1936); – Strandža Planina Mts. [63], 1959 (Paspalev & Markov 1961). – G a b r o v o: Buzludža [64], gallery, 15 April 1967 (Jančev & Stojkova 1973). – K j u s t e n d i l: Rilski Manastir, Kirilova Poljana [65], gallery, 1500 m a. s. l. (Beron et al. 2000b); – Vetren, Goljamata cave [66], 8–9 June 1996: obs. colony of hundreds of bats (Pandurska & Beshkov 1998b). – L o v e č: Bežanovo, Parnicite cave [21], May 1990 – Sept. 1991: nurs. colony of ca. 400 ind. (Pandurska 1998), two visits in summer season: ca. 700–800 ind. and ca. 2700–2800 ind. resp. (mixed colony with *M. myotis*) (Beškov 1993, Beshkov 1998); – Brestnica, Săeva Dupka cave [67], 3 March 1958 (Beron 1958); – Devetaki, Devetaškata Peštera cave [22], May–June 1997: mixed colony (with *M. myotis* and *M. capaccinii*) (Pandurska 1999, Pandurska & Paunović 1997); – Gložene, Morovica cave [68], net. (Beškov 1993, Beshkov 1998); – Karlukovo,

Svirčovica cave [69], 1 May 1958 (Beron 1958); – Karlukovo, Zadănen Dol near Prohodna cave [70], summer 1990: 1 ind. (Popov & Ivanova 1995), spring 1992: 1 ind. (Popov & Ivanova 1995), summer 1992: 1 ind. (Popov & Ivanova 1995); – Krušuna, Uruška Maara cave [28], 24 July 1959: large colony (Beron 1961); – Loveč, Bašbunar park, Kjuljuka cave [71], 25 July 1959 (Beron 1962). – M o n t a n a: Draganica [Čerkaski], Grimnena Dupka cave [72], 15 Sept. 1964 (Beron & Guéorguiev 1967, Beron 1968); – Gorna Bela Rečka [73], 1991–1998 (Pandurska & Beshkov 1998a); – Gorna Luka, Mišin Kamăk cave [74], April 1988: ca. 50 ind. (Beškov 1993, Beshkov 1998), 1991–1998 (Pandurska & Beshkov 1998a); – Prevala, Vreloto cave [75], 17 Sept. 1964 (Kolebinova 1967). – P a z a r d ž i k: Gabrovica, Golak, Golaškata Peštera mine [76], 31 March 1958: 1 ind. (Beron 1958, Beškov 1962); – Velingrad, Lepenica cave [77], 25 Dec. 1960 (Beron 1962). – P e r n i k: Bosnek, Duhlata cave [78] (Beron 1958); – Studena [79], galleries, 18 May 1957 (Beron 1958). – P l e v e n: Devenci, Hajduška Peštera cave [31], May–June 1997: mixed colony (with *M. myotis* and *M. capaccinii*) (Pandurska & Paunović 1997); – Muselievo, Nanin Kamăk cave [80], April 1968: several tens ind. (Beškov 1993, Beshkov 1998), 9 August 1971: several tens ind. (Beron 1972, 1973a, b, Beškov 1993, Beshkov 1998), Febr. 1989: several tens ind. (Beškov 1993, Beshkov 1998). – P l o v d i v: Dobrostan, Ivanova Voda cave [34], 25 August – 5 Sept. 1967: several skeleton/skeletal remains (Hazelton 1970); – Mostovo, Gargina Dupka cave [81], 19 March 1968 [coll. 1ma, NMNHS] (Beron 1970, 1974b, Jančev & Stojkova 1973); – Peruštica [82], rocky gate, 28 April 1985: 1 ind. (from owl pellets) (Obuch & Benda 1996). – R u s e: Červen [83], cave, 1966: mummy (Undžijan 1998), 1991 (Undžijan 1998); – Nisovo [84], 9 Sept. 1992 (Undžijan 1998); – Pepelina, Orlova Čuka cave [85], 26 July 1959 (Beron 1962). – S l i v e n: Kotel, Maarata cave [86], 7 April 1976: 1m, 1f, 1 ind. (Nowosad et al. 1987); – Kotel, Nirica cave [38], 16 April 1960: 1 ind. (Nowosad et al. 1987); – Kotel, Orlovata Peštera cave [39], 11 June 1958: obs. colony of together ca. 5000–6000 ind. (mixed with *M. myotis*) (Beron 1958, cf. Beškov 1993, Beshkov 1998); – Kotel, Temnata Dupka cave [87], 10 April 1975: 1m (Nowosad et al. 1987); – Kotel, Zlosten, Lednicata cave [88], Sept. 1989: 2 ind. (Beškov 1993, Beshkov 1998). – S m o l j a n: Borikovo, Červenata Dupka cave [89], 2 April 1967 (Jančev & Stojkova 1973); – Lăki [90], rocks in the valley bellow the town, 27 April 1985: 1 ind. (from owl pellets) (Obuch & Benda 1996); – Trigrad [Jagodina], Jagodinska cave [45], 6 Jan. 1976: 1f (Nowosad et al. 1987); – Turjan, Garvan'ovica cave [91], 3 April 1967 (Jančev & Stojkova 1973). – S o f i j a: Beledie Han, Kolibata cave [92], 400 ind. (Kvartirnikov 1956), 28 Oct. 1962

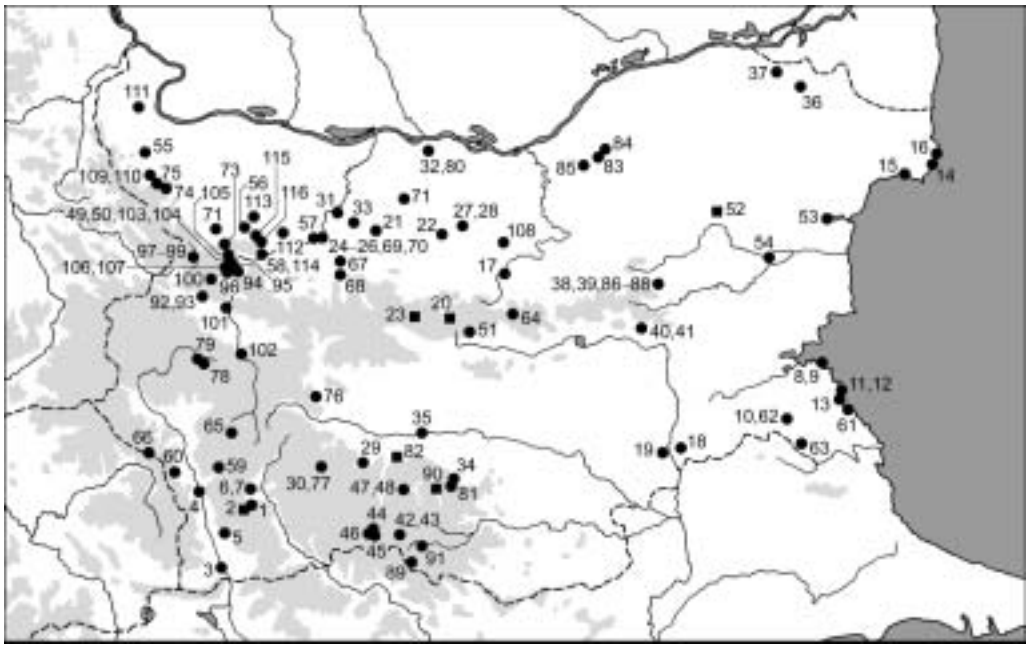

Fig. 8. Records of *Myotis blythii* (Tomes, 1857) in Bulgaria. Explanation of symbols as in Fig. 3. Numbers correspond with locality numbers in the text.

(Jančev & Stojkova 1973), 30 June 1964 (Beron 1968), 1991–1998 (Pandurska & Beshkov 1998a); – Beledie Han, Komina cave [93], 2 July 1959 (Beron 1962); – Bov, Izdrimec peak [94], 1991–1998 (Pandurska & Beshkov 1998a); – Bov, Mečata Peštera cave [95], 15 Febr. 1970 (Jančev & Stojkova 1973); – Cerovo, Vodnata Peštera cave [96], May–June 1997: mixed colony (with *M. myotis* and *M. capaccinii*) (Pandurska & Paunović 1997), 1991–1998 (Pandurska & Beshkov 1998a); – Ginci, Dinevata Pešt cave [97], 5 Dec. 1959 (Beron 1962), 16 Nov. 1963 (Beron 1968, 1974b), 30 Oct. 1967 (Jančev & Stojkova 1973), 1991–1998 (Pandurska & Beshkov 1998a), nettings 1990–1994: 3 ind. (Pandurska et al. 1999); – Ginci, Svetata Voda cave [98], 1991–1998 (Pandurska & Beshkov 1998a); – Ginci, four caves [99], winter cesus 1991–1994: 3 ind. (Pandurska et al. 1999); – Iskrec, Dušnika cave [100], 1991–1998 (Pandurska & Beshkov 1998a); – Kătina [101], gallery (Beron 1958); – Kokaljane, Urvič [102], gallery, 1 Oct. 1963 (Beron & Kolebinova 1964, Kolebinova & Beron 1965); – Lakatnik, Javorecka cave [103], 1991–1998 (Pandurska & Beshkov 1998a); – Lakatnik, Răžiškata Peštera cave [49] (Beron & Guéorguiev 1967), 1991–1998 (Pandurska & Beshkov 1998a); – Lakatnik, Vraži Dupki cave [104] (Kvartirnikov 1956); – Milanovo, Čavkite cave [105], 23 Nov. 1958 (Beron 1962); – Zimevica, Elata cave [106], 4 Dec. 1960 (Beron 1962); – Zimevica, Kacite cave [107], 11 Dec. 1960 (Beron 1962), 1991–1998 (Pandurska & Beshkov 1998a). – V e l i k o T ă r n o v o: Emen, Emenska Peštera cave [108], May–June 1997: mixed colony (with *M. myotis* and *M. capaccinii*) (Pandurska & Paunović 1997). – V i d i n: Dolni Lom, Desni Suhi Peč cave [109], 17 Sept. 1964 (Beron & Guéorguiev 1967); – Dolni Lom, Vodni Peč cave [110], 17 Sept. 1964 (Beron & Guéorguiev 1967); – Orešec, Suhi Peč cave [55], 1991–1998 (Pandurska & Beshkov 1998a); – Vojnica, Studena cave [111], 19 Oct. 1969 (Beron 1972). – V r a c a: Beli Izvor, Kalna Mătnica cave [56], 1991–1998 (Pandurska & Beshkov 1998a); – Kalen, Kalenska Peštera cave [112], 8 Sept. 1959: colony of ca. 100 ind. (Beron 1961, 1962); – Liljače, Prilepnata Peštera cave [113], 7 July 1960 (Beron 1961, 1962); – Ljutadžik, Sokolskata Dupka cave [114], 6 Febr. 1967 (Beron 1968); – Ljutibrod, Gara Čerepiš, Serapionovata cave [58], 1991–1998 (Pandurska & Beshkov 1998a); – Okolčica, Bezimenna cave [115], 1991–1998 (Pandurska & Beshkov 1998a); – Vraca, Golemata Meča Dupka cave [116], 7 Febr. 1967 (Beron 1968). – Bulgaria undef.: Dubroviška cave [*117*], 1985: 1f (Belcheva et al. 1992).

DISTRIBUTIONAL STATUS (Fig. 8). *M. blythii* was recorded in 117 localities (Tab. 11) covering most regions of Bulgaria. Although certain part of former records of this species may actually be included in the records ascribed to *M. myotis* and exact estimation of actuall abundances of both the species in large mixed colonies is almost impossible without, it seems clear – at least based on detailed recent data – that *M. blythii* is in Bulgaria less common than *M. myotis*. Surprisingly, in contrast to its sibling species, *M. blythii* has never been recorded in the well investigated regions of the Eastern Rhodopes Mts. (cf. Ivanova 2003, Ivanova & Gueorguieva in press) while it regularly occurs, even in colonies up to 2000 individuals, in the Greek part of the same mountain range (Ivanova 2000a).

In other parts of Bulgaria, large summer colonies of *M. blythii* are not rare at all. Typically, they consist of several thousands individuals (up to 6000), often forming mixed clusters with *M. myotis* and *M. capaccinii*. Percentage of mist netting captures and winter records (mostly individuals) corresponds to that in *M. myotis*. In Bulgaria, a tendency of *M. blythii* to synanthropy and roosting in buildings is even less pronounced than in *M. myotis*. Its altitudinal distribution is very similar to that in *M. myotis* (living individuals recorded up to 1650 m a. s. l. in the Rhodopes Mts., skeletal remains up to 2500 m a. s. l. in the Pirin Mts.). External and cranial dimensions of examined specimens of *M. blythii* from Bulgaria are shown in Tab. 4.

Large-sized *Myotis* sp. (= *M. myotis* or *M. blythii*)

RECORDS. **Original data**: B u r g a s: Primorsko, Maslen Nos cape, Tjulenovata Peštera cave, 23 August 1997: obs. colony of ca. 1000 ind., 16 July 1998: obs. nurs. colony of ca. 1500 ind.; – Primorsko, Perla, abandoned building (hotel), 29 August 2000: obs. ca. 200 ind. – G a b r o v o: Drjanovo, Andăka cave, 22 Feb. 1998: obs. ca. 20 ind., 20 Jan. 2000: obs. 4 ind.; – Drjanovo, Bačo Kiro cave, 22 Jan. 1998: obs. 20 ind. – J a m b o l: Melnica, Vodnata Drănči Dupka cave, 30 June 2000: obs. ca. 1000 ind. – L o v e č: Aprilci, Pleven hut, Vodnite Dupki cave, 24 May 1999: net. 16 ind., 29 Jan. 2000: obs. ca. 130 ind., 4 Feb. 2001: obs. ca. 250 ind.; – Bežanovo, Parnicite cave, 12 May 1990: obs. colony of ca. 2500 ind., 21 Jan. 1995: obs. 2 ind., 20 Jan. 1996: obs. ca. 150 ind., 28 Jan. 1998: obs. 30 ind., 15 May 1998: obs. ca. 140 ind., 5 Dec. 1999: obs. ca. 150 ind., 26 May

2000: obs. nurs. colony of ca. 1000 ind., 13 Jan. 2002: obs. 20 ind.; – Devetaki, Devetaškata Peštera cave, 13 August 1994: obs. nurs. colony of ca. 1000 ind., 2 Nov. 1996: obs. ca. 100 ind., 15 May 1998: obs. ca. 3000 ind., 30 July 1998: obs. nurs. colony of ca. 6000 ind., 11 Sept. 1998: obs. ca. 150 ind., 7 Nov. 1999: obs. 20 ind., 19 Jan. 2000: obs. ca. 350 ind., 4 June 2000: obs. ca. 1000 ind., 14 July 2000: obs. nurs. colony of ca. 8000 ind., 24 Sept. 2000: obs. ca. 100 ind., 7 June 2001: obs. nurs. colony of ca. 3000 ind., 12 Jan. 2002: obs. 10 ind.; – Čavdarci, Mandrata cave, 7 June 2001: obs. ca. 900 ind.; – Karlukovo, Troevratica cave, 4 April 1995: obs. ca. 500 ind., 21 May 2000: obs. nurs. colony of ca. 2000 ind.; – Krušuna, Uruška Maara cave, 30 July 1998: obs. nurs. colony of ca. 4500 ind., 18 May 1999: obs. ca. 1000 ind. (leg. N. Simov), 7 Nov. 1999: obs. 10 ind., 3 June 2000: obs. nurs. colony of 2000 ind., 7 June 2001: obs. nurs. colony of ca. 500 ind. – P l e v e n: Devenci, Hajduškata Peštera cave, 10 May 1997: obs. ca. 1200 ind., 4 Dec. 1999: obs. 20 ind. – R u s e: Pepelina, Orlova Čuka cave, 31 Jan. 1998: obs. 90 ind., 21 Jan. 2000: obs. 70 ind. – S l i v e n: Kotel, Zelenič, Orlovata Peštera cave, 4 July 2000: obs. nurs. colony of ca. 2000 ind. – Š u m e n: Divdjadovo, Zandana cave (Divdjadovski), 29 June 1995: obs. nurs. colony of ca. 500 ind. (cf. Ivanova 2001), 30 June 2000: obs. nurs. colony of ca. 2000 ind. (cf. Ivanova 2001); – Madara, Hiljadite Očički cave, 28 June 1995: obs. nurs. colony of ca. 3000 ind. (cf. Ivanova 2001), 4 Oct. 1996: obs. ca. 1000 ind. (cf. Ivanova 2001), 1 July 2000: obs. nurs. colony of ca. 5000 ind. (cf. Ivanova 2001); – Šumen, Zandana cave, 29 Sept. 1996: obs. ca. 100 ind. (cf. Ivanova 2001), 23 Jan. 2000: obs. ca. 450 ind. (cf. Ivanova 2001), 29 June 2000: obs. 3 ind. (cf. Ivanova 2001). – T ă r g o v i š t e: Prolaz, Derventskata Peštera cave, 2 July 2000: obs. nurs. colony of ca. 4000 ind. (cf. Ivanova 2001); – Prolaz, Marina Dupka cave, 1 July 2000: obs. nurs. colony of ca. 4000 ind. (cf. Ivanova 2001). – V e l i k o T ă r n o v o: Emen, Emenskata Peštera cave, 22 Oct. 1989: obs. ca. 200 ind (cf. Beškov 1993, Beshkov 1998), 29 April 1995: obs. ca. 500 ind., 13 April 1996: obs. ca. 2000 ind., 15 May 1998: obs. ca. 600 ind., 27 July 1998: obs. nurs. colony ca. 1000 ind., 12 Sept. 1998: obs. 20 ind., 25 May 1999: obs. ca. 1000 ind., 19 April 2000: obs. 5 ind. (leg. T. Troanski), 29 May 2000: obs. ca. 1000 ind., 23 Sept. 2000: obs. ca. 200 ind. – V i d i n: Orešec, Suhi Peč cave, 20 July 2000: obs. ca. 800 ind. – V r a c a: Beli Izvor, Kalna Mătnica cave, 12 June 1994: obs. nurs colony, 22 August 1998: obs. 20 ind. (leg. N. Simov), 11 Dec. 1999: obs. 25 ind., 22 July 2000: obs. nurs. colony of ca. 3000 ind.; – Čiren, Ponora cave, 3 March 1997: obs. 30 ind., 27 Jan. 1998: obs. ca. 70 ind., 27 July 2000: obs. 10 ind.; – Kunino, Čeloveča Dupka cave, 4 April 1995: obs. 20 ind., 22 July 1995: obs. ca. 50 ind., 11 August 1999: obs. 2 ind., 11 Dec. 1999: obs. 7 ind., 21 May 2000: obs. 3 ind.; – Ljutibrod, Gara Čerepiš, Serapionovata cave, 24 Nov. 1988: obs. ca. 50 ind., 7 Jan. 1989: obs. ca. 60 ind., 1 June 1991: obs. nurs. colony of ca. 4000 ind., 15 April 1993: obs. ca. 1000 ind., 11 May and 15 June 1994: obs. nurs. colony of ca. 4000 ind. – **Published data**: B u r g a s: Burgaskite Ezera lakes, Sept.–Oct. 2002 (Pandurski 2003); – Primorsko, Maslen Nos cape, Južnata Podmolna Peštera cave, Oct. 1989: several tens ind. (Beškov 1993, Beshkov 1998). – G a b r o v o: Jantra, Prilepnata Peštera cave, May 1989: nurs. colony of ca. 5600 ind. (Beškov 1993, Beshkov 1998). – J a m b o l: Melnica, Vodnata Drănči Dupka cave, August 1970: several ind. (Beškov 1993, Beshkov 1998), March 1971: several hundreds ind. (Beškov 1993, Beshkov 1998), Nov. 1989: several ind. (Beškov 1993, Beshkov 1998). – K ă r d ž a l i: Visoka Poljana, Jarasă-Ini cave, April 1989 (Beškov 1993, Beshkov 1998), June 1989: nurs. colony of 7000–8000 ind. (Beškov 1993, Beshkov 1998). – L o v e č: Čiflik, Hajduška Pesen hut, gallery (Beron et al. 2000a); – Gložene, Ljastovicata cave, two visits: 900 and 80 ind. (Beškov 1993, Beshkov 1998); – Goljama Željazna, Toplja cave, Oct. 1989: several ind. (Beškov 1993, Beshkov 1998, cf. Pandurska 2003); – Karlukovo, Zadănen Dol, near Prohodna cave, summer 1988: 7 ind. (Popov & Ivanova 1995), summer 1989: 18 ind. (Popov & Ivanova 1995), summer 1990: 4 ind. (Popov & Ivanova 1995), summer 1991: 9 ind. (Popov & Ivanova 1995), summer 1992: 15 ind. (Popov & Ivanova 1995), spring 1993: 3 ind. (Popov & Ivanova 1995); – Krušuna, Uruška Maara cave, 1958–1966: several ind. (Beškov 1993, Beshkov 1993), August 1988: several tens ind. (Beškov 1993). – M o n t a n a: Gorna Luka, Mišin Kamăk cave, Dec. 1988: 13 ind. (Beškov 1993, Beshkov 1998). – P l e v e n: Bohot, Kirov Vărtop chasm, winter visit: several ind. (Beškov 1993, Beshkov 1998); – Devenci, Hajduška Peštera cave, April 1989: several ind. (Beškov 1993, Beshkov 1998); – Reselec, Temnata Dupka cave (Beškov 1993, Beshkov 1998); – Sadovec, Gininata Peštera cave, July 1988: several ind. (Beškov 1993, Beshkov 1998). – P l o v d i v: Kărnare, Trojanski Prohod pass, Mazata cave (Beron et al. 2000a). – R u s e: Pepelina, Orlova Čuka cave, summer and winter colonies (Beškov 1993, Beshkov 1998), March 1989: tens ind. (Beškov 1993, Beshkov 1998), Nov. 1989: several ind. (Beškov 1993, Beshkov 1998). – S o f i j a: Beledie Han, Kolibata cave, August 1955: colony of 600–800 ind. (mixed with *M. schreibersii*) (Beškov 1993, Beshkov 1998), August 1989: colony of 60–80 ind. (mixed with *M. schreibersii*) (Beškov 1993, Beshkov 1998), 24 June and 2 August 1995: 200 f+j (Pandurska 1998). – Š u m e n: Madara, Madarskija Konnik crevice [= Hiljadite Očički], summer visits: colonies of 2900–3000 ind., resp. 3000–4000 ind. (Beškov 1993, Beškov et al. 1994, Beshkov 1998). – T ă r g o v i š t e: Prolaz, Prolazkata Peštera cave [= Derventskata Peštera], summer 1958: several hundreds ind. (Beškov 1993, Beshkov 1998), summer 1970: several hundreds ind. (Beškov 1993, Beshkov 1998), winter 1971: 300–400 ind. (Beškov 1993, Beshkov 1998), summer 1988: ca. 350 ind. (Beškov 1993, Beshkov 1998), winter 1988: ca. 150 ind. (Beškov 1993, Beshkov 1998). – V i d i n:

Orešec, Suhi Peč cave, April 1988: several ind. (Beškov 1993, Beshkov 1998, cf. Pandurska 2003). – V r a c a: Beli Izvor, Kalna Mătnica cave, 1965–1971: several ind. (Beškov 1993, Beshkov 1998), 24 April 1997: ca. 1000 ind. (Pandurska 2003); – Čiren, Ponora cave, 1958–1966: large colony (Beškov 1993, Beshkov 1998), summer 1988: colony of ca. 900 ind. (Beškov 1993, Beshkov 1998); – Kalen, Kalenska Pešt cave, March 1989: 2 ind. (Beškov 1993, Beshkov 1998); – Liljače, Božijat Most cave, July 1958: colony of several thousands ind. (mixed with *M. schreibersii*) (Beškov 1993, Beshkov 1998); – Vraca, Jamata chasm, Nov. 1988: 55 ind. (Beškov 1993, Beshkov 1998).

Myotis bechsteinii (Kuhl, 1817)

Records. **Original data**: B l a g o e v g r a d: Kresna, Gara Pejo Javorov [1], on the road, 5 Oct. 1995: coll. 1ma (NMNHS 053; leg. P. Tenčev); – Ribnovo, Manuilovata Peštera cave [2], 22 June 2000: net. 2ma. – B u r g a s: Mladežko, Lejarnicite cave [3], 25 Aug. 1999: net. 1ma; – Primorsko, Arkutino [4], 6 June 1972: coll. 2fs (NMP 50415, 50416 [S+B]; leg. Z. Bárta; cf. Horáček et al. 1974). – H a s k o v o: Dolno Čerkovište [5], Orešari reserve, rock crevice, 30 Sept. 2003: obs. 1mj (leg. R. Lučan). – J a m b o l: Ustrem, Bozkite cave [6], 10 April 1998: net. 2ma. – K ă r d ž a l i: Ribino, Samara cave [7], 20 April 1995: net. 1ma (cf. Ivanova 1997). – L o v e č: Aprilci, Vodnite Dupki cave [8], 15 August 1997: net. 9ma (cf. Ivanova 1998, Beron et al. 2000a); – Brestnica, Săeva Dupka cave [9], 1 May 1999: net. 1ma; – Divčovoto, Graždenica cave [10], 28 Sept. 1997: net. 1m (cf. Ivanova 1998, Beron et al. 2000a); – Goljama Željazna, Toplja cave [11], 2 Febr. 1997: coll. 1ma (NMNHS 099); – Karlukovo, cave behind monastery [12], 8 August 1978: net. 2ma (NMP 49759 [S+B], 49764 [S+A]), 9 August 1978: net. 1ma (NMP 49776 [S+B]); – Karlukovo, cave in the monastery [13], 9 August 1978: net. 4fs (NMP 49772–49774 [S+B], 49775 [S+A]); – Karlukovo, ridge above rocky amphitheatre [14], 15 June 1977: net. 1ms (NMP 49651 [S+B]); – Karlukovo, ridge of a rocky amphitheatre [15], 6 August 1978: net. 1ma (NMP 49743 [S+A]; cf. Hůrka 1984a). – M o n t a n a: Gorna Bela Rečka [16], gallery, 3 April 1996: net. 1ma (leg. R. Pandurska & V. Beškov). – P l o v d i v: Kărnare, Mazata cave [17], 25 Sept. 1997: net. 1m (cf. Ivanova 1998, Beron et al. 2000a). – S m o l j a n: Jagodina, Imamova (= Jagodinskata) cave [18], 2 August 1971: net. 1ma (NMP 49349 [B]; cf. Horáček et al. 1971, 1974), 15 August 1978: net. 1ms (NMP 49789 [S+B]). –

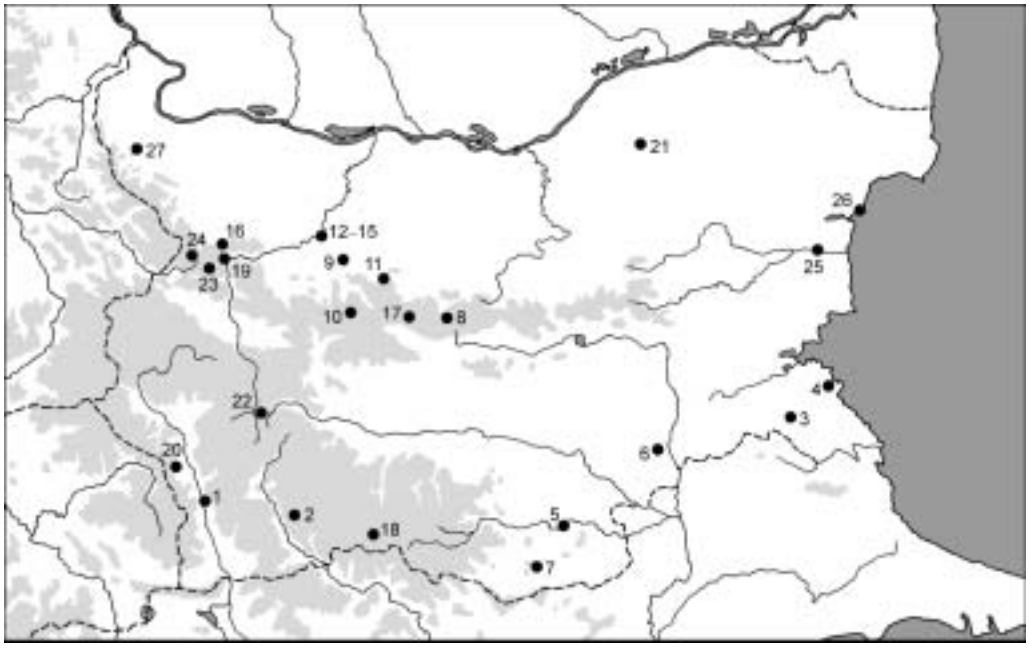

Fig. 9. Records of *Myotis bechsteinii* (Kuhl, 1817) in Bulgaria. Numbers correspond with locality numbers in the text.

S o f i j a: Lakatnik, Svinskata Dupka cave [19], 24 August 1995: coll. 1ma (NMNHS). – **Published data**: B l a g o e v g r a d: Leško, cave [20], 8 June 1996: net. 1 ind. [1ma] (Pandurska & Beshkov 1998b). – R a z g r a d: Krivnja, Božkova Dupka cave [21], March 1989: [1ma] (Beškov 1993, Beshkov 1998). – S o f i j a: Borovec [22], 1350 m, 18 July 1950 [NMNHS] (Hanák & Josifov 1959); – Breze, Travninata cave [23], 1991–1998 [5 Sept. 1994] (Pandurska & Beshkov 1998a, Pandurska et al. 19994); – Ginci, Dinevata Pešt cave [24], 1991–1998 [15 Sept. 1996] (Pandurska & Beshkov 1998a), nettings 1990–1994: 1 ind. (Pandurska et al. 1999). – V a r n a: Kamčija river [25], June 1935: 1m, 1f (Heinrich 1936); – Varna, Evksinograd [26], 3 August 1935: 1ma, 2fa [NMNHS 037-1–3] (Hanák & Josifov 1959). – V i d i n: Belogradčik, Gornata Propast chasm [27], 6 Febr. 1960: coll. 1ma (Beron 1961, 1962).

DISTRIBUTIONAL STATUS (Fig. 9). First record of *M. bechsteinii* from the Bulgarian territory was published by Heinrich (1936), further records by Hanák & Josifov (1959) and Beron (1961). At that time, the data were very important as represented the southern marginal records of the east European range of this species. Up to present, the species has been recorded in 27 localities (Tab. 11) which are dispersed throughout the whole Bulgaria. Most findings come from the mountain regions in the western part of the country but there is also a number of records from maritime regions and from lowlands. It seems that in Bulgaria *M. bechsteinii*, in contrast with some other central European forest species (e. g., *Barbastella barbastellus* and *Plecotus auritus*), inhabits wooded areas irrespectively of their elevation.

Major part of records are mist netting captures at cave entrances (mostly in late summer and spring period with clear predominance of males), two are captures in riparian habitats along river valleys and three are winter records in cave hibernacula. Until now, no nursery colony was discovered. The highest altitudinal record of *M. bechsteinii* is from 1400 m a. s. l. (Vodnite Dupki cave, Balkan Mts.). As in other dendrophilous species, actual abundance of *M. bechsteinii* may be not directly related to the number of available records and may be underestimated. In any case, the species still must be considered rare in Bulgaria with a population splitted into local patches of broadleaf woodland habitats. Such a conclusion is in a good accord with the situation in neighbouring countries which suggests that the total range of the species extends much more to the south than previously supposed, up to the Peloponnese and Anatolia (Helversen & Weid 1990, Uhrin et al. 1996a, Benda & Horáček 1998, Hanák et al. 2001). External and cranial dimensions of examined specimens of *M. bechsteinii* from Bulgaria are shown in Tab. 4.

Myotis nattereri (Kuhl, 1817)

RECORDS. **Original data**: B l a g o e v g r a d: General Todorov, Pčelina hill [1], gallery, 23 July 1995: net. 1ma, 1fa (leg. J. Sádlová); – Gorna Breznica, over a brook [2], 15 July 1982: net. 1ma, 2fa (NMP 50176–50178 [S+B]; cf. Benda & Horáček 1995), 11 July 1983: net. 2faL (NMP 50180, 50181 [S]); – Gorna Breznica, spring N of village [3], 16 July 1981: net. 1ms (NMP 50174 [S+B]; cf. Benda & Horáček 1995); – Ilindenci, rocky fissure [4], 7 July 1986: net. colony 27 ind. (exam. 8faL, 5mj, 3fj); – Ploski, cave [5], 16 July 1982: net. 1fa (NMP 50179 [S+A]; cf. Benda & Horáček 1995), 3 July 1986: net. 1ms, 14 August 1987: net. 2fa (NMP 50066, 50067 [S+B]); – Razlog, Propadnalata Peštera cave [6], 19 July 1982: net. 1ma. – B u r g a s: Černomorec, lake in a quarry [7], 18 July 1987: net. 1ms. – H a s k o v o: Spahievo, galleries in Aida hill [8], 14 July 1986: net. 1ma (NMP 50159 [S+B]). – K j u s t e n d i l: Rilski Manastir, Ilijna Reka river [9], gallery, 1000 m a. s. l., 5 July 2001: net. 1ma (leg. N. Simov). – L o v e č: Brestnica, Săeva Dupka cave [10], 1 May 1999: net. 1ma; – Devetaki, Devetaškata Peštera cave [11], 20 May 1999: net. 1fa (leg. C. Dietz); – Karlukovo, cave behind monastery [12], 8 August 1978: net. 1fa (NMP 50162 [S+A]; cf. Benda & Horáček 1995); – Karlukovo, ridge above rocky amphitheatre [13], 12 June 1977: net. 1ma (NMP 50161 [S+A]; cf. Benda & Horáček 1995). – M o n t a n a: Gorna Bela Rečka, gallery [14], 4 April 1995: coll. 2ma (NMNHS 013, 014), 26 Oct. 1997: net. 1 ind. (leg. R. Pandurska, cf. Pandurska & Beshkov 1998a), 14 April 1998: obs. 1ma. – P a z a r d ž i k: Sărnica, Dospat dam [15], forest, 10 August 2002: net. 1fa; – Velingrad, Suhata Peštera cave (near Lepenica quarry) [16], 27 June 2000: net. 1ma. – S i l i s t r a: Vojnovo, Malkata Badžalija cave [17], 5 Oct. 1999: net. 1ma. – S m o l j a n: Gela, small cave n. village [18], 12 August 1978: net. 1ms (NMP 50163 [S+A]; cf. Benda & Horáček 1995), 13 August 1978: net. 1ms (NMP 50164 [S+A]; cf. Benda & Horáček 1995); – Gela, Ledenica cave [19], 1650 m a. s. l., 13 August 1978:

net. 2ma, 3ms, 1mj, 1fa (NMP 50165–50171 [S+A]; cf. Benda & Horáček 1995); – Jagodina, Dolna Karanska Dupka cave [20], 16 August 1978: net. 1fa (NMP 50172 [S+A]; cf. Benda & Horáček 1995); – Jagodina, Gorna Karanska Dupka cave [21], 3 August 1971: net. 1ma (NMP 50182 [S]; cf. 1971, Horáček et al. 1974); – Orehovo, cave 100 m W of the village [22], 24 August 1980: net. 1ma (NMP 50173 [S+B]; cf. Benda & Horáček 1995). – S o f i j a: Sofija [23], 23 May 1905: coll. 1 ind. (NMNHS, leg. I. Bureš). – Š u m e n: Šumen, Zandana cave [24], 23 Jan. 2000: obs. 7 ind. (cf. Ivanova 2001). – **Published data**: B l a g o e v g r a d: Leško [25], cave, 4–5 Oct. 1995: net. 2 subad. ind. (Pandurska & Beshkov 1998b). – K j u s t e n d i l: Rilski Manastir, Kirilova Poljana [26], gallery, 1500 m a. s. l. (Beron et al. 2000b); – Vetren, Goljamata cave [27], 8–9 June 1996: net. 1 ind. (Pandurska & Beshkov 1998b). – L o v e č: Karlukovo, Zadănen Dol near Prohodna cave [28], summer 1988: 1 ind. (Popov & Ivanova 1995), summer 1991: 2 ind. (Popov & Ivanova 1995). – P a z a r d ž i k: Sestrimo, Kriva Reka river valley, Stankovi Baraki [29], 1200 m a. s. l. (Beron et al. 2000b); – S o f i j a: Bov, Izdrimec peak [30], 1991–1998 (Pandurska & Beshkov 1998a); – Breze, Travninata cave [31], 1991–1998 (Pandurska & Beshkov 1998a); – Ginci, Dinevata Pešt cave [32] [22 Sept. 1991: net. 1ma] (Pandurska et al. 1999); – 1991–1998 (Pandurska & Beshkov 1998a); – Iskrec, Dušnika cave [33], 1991–1998 (Pandurska & Beshkov 1998a). – V r a c a: Okolčica, Bezimenna cave [34], 1991–1998 (Pandurska & Beshkov 1998a).

DISTRIBUTIONAL STATUS (Fig. 10). The total of 34 localities (Tab. 11) shows that *M. nattereri* was recorded in different parts of Bulgaria but particularly in the medium and high altitude regions of the western part of the country (the average altitude was 740 m and the maximum 1650 m a. s. l., Ledenica cave in the Western Rhodopes Mts.). This, however, can be due to certain bias since the activity of researches was concentrated to karstic and woody areas at such elevations. Most records resulted of mist netting at entrances to caves and mines (mostly in late summer and spring), four of netting over water sky. No winter record is available and one maternity colony of 27 individuals was found in a rocky fissure in Struma region.

Despite of a higher number of records, the status of *M. nattereri* in Bulgaria is similar to that in neighbouring south-Balkan countries (Chytil & Vlašín 1994, Benda & Horáček 1998, Kryštufek et

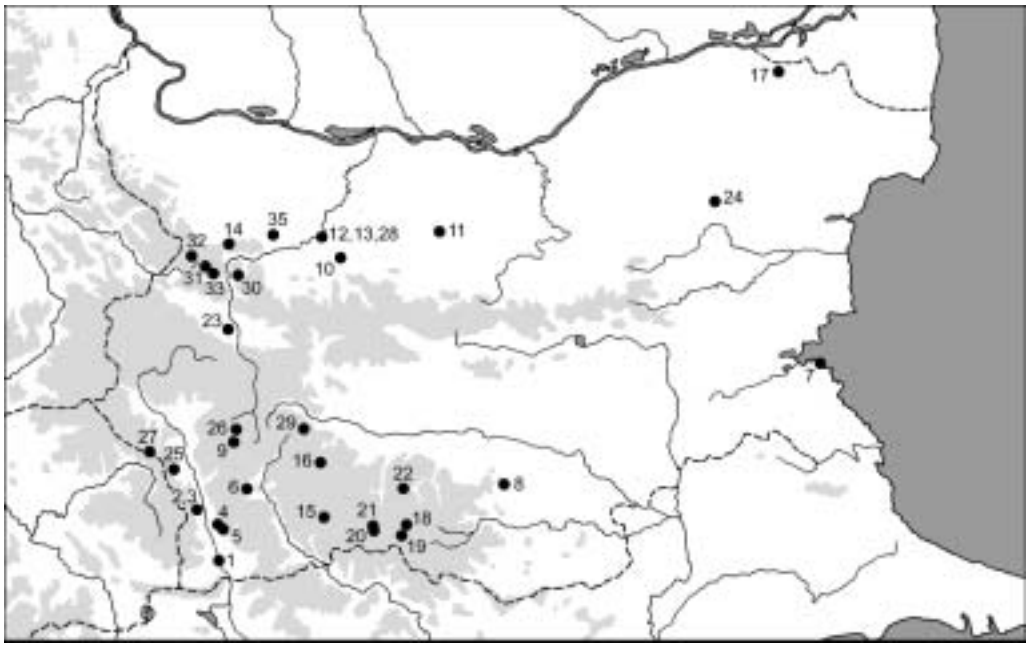

Fig. 10. Records of *Myotis nattereri* (Kuhl, 1817) in Bulgaria. Numbers correspond with locality numbers in the text.

Tab. 5. Basic biometric data for examined Bulgarian samples of *Myotis nattereri* (Kuhl, 1817), *M. emarginatus* (Geoffroy, 1806), and *M. capaccinii* (Bonaparte, 1837). For abbreviations see p. 250

	Myotis nattereri					*Myotis emarginatus*					*Myotis capaccinii*				
	n	min	max	M	SD	n	min	max	M	SD	n	min	max	M	SD
LC	23	39.0	50.0	45.5	2.921	69	42.0	53.0	48.4	2.080	30	45.0	58.0	50.9	2.888
LCd	23	39.0	49.0	44.7	2.636	68	27.0	50.0	44.2	3.305	26	35.0	48.0	41.3	3.496
LAt	23	37.8	42.8	40.2	1.170	83	33.5	45.0	39.9	1.652	31	39.4	44.0	41.7	1.068
LA	22	15.3	20.0	17.3	1.186	69	15.0	20.0	17.4	1.247	28	13.0	17.2	15.2	1.074
LTr	23	7.2	14.0	11.3	1.368	58	8.5	11.0	9.8	0.625	28	6.5	10.5	7.9	0.915
G	20	5.0	9.0	6.5	0.883	79	4.0	12.0	8.5	1.482	31	6.0	15.0	10.0	2.633
LCr	23	15.30	16.35	15.67	0.290	55	14.91	16.33	15.60	0.351	23	15.18	15.82	15.50	0.204
LCb	21	14.25	15.15	14.57	0.282	54	14.13	15.62	14.77	0.367	25	14.01	14.75	14.35	0.203
LaZ	18	9.40	10.47	9.91	0.291	46	9.21	10.15	9.63	0.228	18	9.07	9.82	9.44	0.190
LaI	23	3.51	3.95	3.72	0.107	59	3.38	3.77	3.54	0.105	28	3.42	3.83	3.66	0.110
LaN	24	7.59	8.35	7.87	0.187	59	7.03	7.75	7.33	0.125	26	7.65	8.22	7.96	0.151
AN	24	5.35	6.15	5.72	0.185	53	5.42	6.02	5.71	0.137	25	5.58	5.97	5.73	0.105
CC	21	3.83	4.20	4.02	0.105	59	3.53	4.27	3.95	0.146	28	3.48	4.17	3.92	0.150
M^3M^3	22	6.08	6.82	6.43	0.207	59	5.62	6.45	6.08	0.184	28	5.27	6.45	6.05	0.219
CM^3	23	5.77	6.42	6.07	0.155	59	5.95	6.59	6.30	0.168	29	5.35	5.91	5.65	0.143
LMd	24	10.80	11.95	11.37	0.277	55	10.84	12.20	11.57	0.328	28	10.38	11.38	10.87	0.257
ACo	23	2.85	3.60	3.28	0.195	54	3.11	3.67	3.46	0.120	27	2.75	3.28	2.99	0.135
CM_3	25	6.11	6.83	6.49	0.189	55	5.93	7.11	6.69	0.228	28	5.69	6.53	5.99	0.164

al. 1998, Hanák et al. 2001): it appears among recedent but regular elements of the Mediterranan bat fauna (Horáček et al. 2000). The species is uncommon in Romania as well (Valenciuc 1994, Gheorghiu et al. 2001), while it is common in mesic regions of central Europe (Mitchell-Jones et al. 1999). External and cranial dimensions of examined specimens of *M. nattereri* from Bulgaria are shown in Tab. 5.

Myotis emarginatus (Geoffroy, 1806)

Records. **Original data**: B l a g o e v g r a d: Kresna, Gara Pejo Javorov, building [1], 7 May 1994: obs. nurs. colony of ca. 400 ind., 30 April 2001: obs. nurs. colony of ca. 800 ind.; – Kresna, Gara Pejo Javorov, gallery [2], 20 July 1990: obs. nurs. colony, 18 May 1991: obs. nurs. colony of ca. 350 ind., 7 May 1994: obs. nurs. colony of ca. 300 ind., 14 May 1999: obs. nurs. colony of ca. 800 ind., 30 April 2001: obs. nurs. colony of ca. 70 ind.; – Ploski, cave [3], 3 July 1986: net. 2faL; – Razlog, Meča Dupka cave [4], 30 August 1980: net. 6ma (NMP 50339–50344 [S+A]); – Ribnovo, Manuilovata Peštera cave [5], 22 June 2000: net. 2ma. – B u r g a s: Bilka, Goljam Kamăk hill [6], cave, 13 July 1979: obs. colony of ca. 180 ind., net. 70fa+j (coll. 5fa, NMP 50326–50330 [S+A]); – Černomorec, Nos Atija cape [7], abri, 12 July 1987: obs. 2ma; – Primorsko, Arkutino, water station building [8], 13 May 1983: obs. colony of 30 ind., coll. 9fa (NMP 50360–50368 [A]; leg. T. Scholz & D. Král); – Primorsko, Arkutino, Solenka area, building [9], 3 July 1995: obs. nurs. colony of ca. 400 ind., 7 July 1996: obs. nurs. colony of ca. 1200 ind., 16 July 1998: obs. nurs. colony of ca. 2700 ind.; – Primorsko, Karaul Taš, rocks [10], 27 June 1968: coll. 1fa (NMNHS; leg. P. Beron, cf. Beron 1970), 17 August 1971: coll. 1fs (NMP 47/72/C96 [S+B]; cf. Horáček et al. 1974). – G a b r o v o: Armenite, Černata Peštera cave [11], 26 July 1998: obs. nurs. colony of ca. 50 ind. (exam. 1faL, 1fj, 1mj). – H a s k o v o: Gaberovo, Gjurgen Dere [12], caves, 13 July 1997: obs. nurs. colony of ca. 7000 ind., 19 May 1998: obs. nurs. colony of ca. 50 ind., 14 June 1998: obs. nurs. colony of ca. 500 ind., 19 July 1998: obs. nurs. colony of ca. 500 ind. – J a m b o l: Ustrem, Bozkite cave [13], 10 April 1998: net. 1ma. – K ă r d ž a l i: Ribino, Samara cave [14], 1 April 1995: obs. 1 ind. (cf. Ivanova 1997), 20 April 1995: net. 1fa (cf. Ivanova 1997), 18 Nov. 1997: obs. 1 ind. (cf. Ivanova 1997), 18 May 1998: obs. 1ma, 30 Dec. 1999: obs. 3 ind.; – Ribino, Aina Ini cave [15], 11 June 1996: trap. 1faL+j (cf. Ivanova 1997). – K j u s t e n d i l: Rilski Manastir, Kirilova Poljana [16], gallery, 18 Dec. 2002: obs. 1ma. – L o v e č: Aprilci, Vodnite Dupki cave [17], 15 August 1997: net. 1m, 1f (cf. Ivanova 1998, Beron et al. 2000a); – Bežanovo, Parnicite cave [18], small cave near the lower entrance, 15 May 1998: obs. colony of ca. 600 ind.; – Čavdarci, Mandrata cave [19], 25 June 2001: obs. nurs. colony; – Devetaki, Devetaškata Peštera cave [20], 15 May 1998. obs. colony of ca. 600 ind., 20 May 1999: net. 4fa (leg. C. Dietz), 25 June 2001: obs. nurs. colony

of ca. 400 ind.; – Gložene, Morovica cave [21], 25 Febr. 1998: obs. 1 ind.; – Goljama Željazna, Toplja cave [22], 2 Febr. 1997: obs. 1 ind.; – Karlukovo, small cave near Prohodna [23], 9 August 1978: net. 1fs (NMP 50303 [S+A]); – Karlukovo, ridge above rocky amphitheatre [24], 3 July 1976: net. 1fs (NMP 50207 [A]), 12 June 1977: net. 2fa (NMP 50222 [S+A], 50223 [A]), 15 June 1977: net. 2fa, 1fs (NMP 50231–50233 [S+A]); – Krušuna, Uruška Maara cave [25], 21 May 1994, net. 2fa, obs. nurs. colony, 27 June 2001: obs. nurs. colony of ca. 50 ind. – M o n t a n a: Belimel, Parasinskata Propast chasm [26], 18 July 2000: obs. nurs. colony of ca. 100 ind.; – Mitrovci, Goljamata Mitrovska Peštera cave [27], 18 July 2000: obs. 20 ind. – P a z a r d ž i k: Peštera, Snežanka cave [28], 19 Sept. 1962: coll. 2fa (NMP 50205 [A], IVB 11 [S+B]); – Peštera, Ušatovi Dupki cave [29], 8 August 1967: coll. 1fs (IVB 38 [S+B]); – Peštera, Vodnata Peštera cave [30], 2 March 1992: obs. 1fa; – Velingrad, Lepenica cave [31], 9 July 1981: net. 2ma (NMP 50150, 50151 [S+B]); – Velingrad, a cave ca. 400 m above the Lepenica cave [32], 9 July 1981: net. 1ms. – P l e v e n: Devenci, Hajduška Peštera cave [33], 10 May 1997: obs. 1ind.; – Muselievo, Nanin Kamăk cave [34], 10 May 1997: obs. 10 ind., 21 June 1997: obs. nurs. colony of ca. 40 ind., 26 May 2000: obs. 50 ind., 30 May 2001: obs. 20 ind.; – Pleven, park Kajlăka [35], underground channel, 8 August 1997: obs. 1 ind.; – Rakita, Sedlarkata cave [36], 14 May 1998: net. 1fa. – P l o v d i v: Kalofer, Raj hut, Han Maara cave [37], 17 August 1997: net. 2m (cf. Ivanova 1998, Beron et al. 2000a); – Kărnare, Mazata cave [38], 3 Nov. 1997: obs. 1fa (leg. P. Beron & V. Beškov, cf. Ivanova 1998). – R a z g r a d: Krivnja, Božkova Dupka cave [39], 22 Jan. 2000: obs. 1ma. – S i l i s t r a: Balik [40], cave No. 405, 19 April 1999: obs. 1ma; – Vojnovo, Malkata Badžalija cave [41], 16 April 1999: net. 3ma. – S l i v e n: Sliven, Zmejovi Dupki cave [42], 25 May 1957: obs. colony of ca. 50 ind., coll. 27fa, 1fj (NMP 50185–50197 [S+A], 49147, 49149, 49154–49157, 49159–49161, 49164 [S+B], 50183 [S], 50184, 49153, 49158, 49163 [B]; cf. Hůrka 1958, Hanák & Josifov 1959, Dusbábek 1964a), 15 July 1975: net. 5fa, 1fj (NMP 50278, 50281, 50283, 50285–50287 [A]). – S m o l j a n: Borikovo, Borikovskata cave [43], 1 Jan. 2003: obs. 1m, 9 ind.; – Gela, Ledenica cave [44], 31 July 1971: net. 2ma (coll. 1 ind., NMP 38562 [S+B]; cf. Horáček et al. 1971, 1974); – Jagodina, Gorna Karanska Dupka cave [45], 3 August 1971: net. 1ma (NMP 38561 [S+B]; cf. Horáček et al. 1971, 1974); – Jagodina, Imamova (= Jagodinskata) cave [46], 2 August 1971: net. 6ma (NMP 38559, 38560, 38563, 4 unnumbered spec. [S+B]; cf. Horáček et al. 1971, 1974), 15 August 1978: net. 2ma, 1ms (NMP 50317–50319 [S+A]); – Jagodina, Sančova Dupka cave [47], 3 August 1971: net. 3ma (cf. Horáček et al. 1971, 1974),

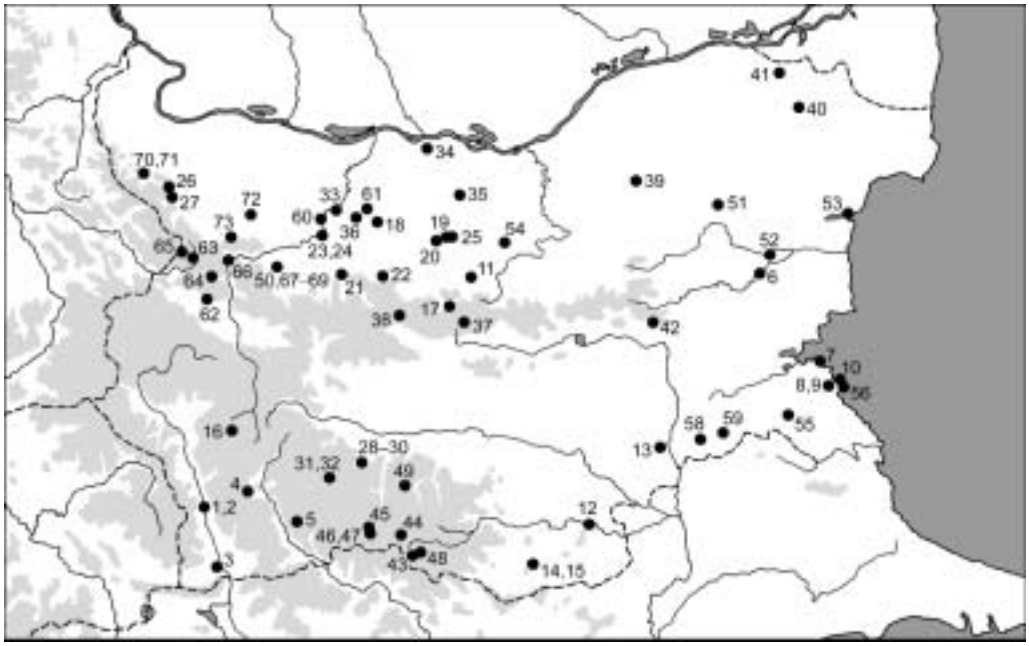

Fig. 11. Records of *Myotis emarginatus* (Geoffroy, 1806) in Bulgaria. Numbers correspond with locality numbers in the text.

15 August 1978: net. 3ma (NMP 50314–50316 [S+A]); – Mogilica, Uhlovica cave [48], 20 July 1996: net. 4ma; – Orehovo, cave 100 m W of the village [49], 28 June 1984: net. 1fa (leg. T. Scholz & D. Král). – S o f i j a: Lipnica, Krivata Pešt cave [50], 5 May 1971: coll. 1fa (NMNHS; leg. V. Beškov). – Š u m e n: Šumen, Zandana cave [51], 29 June 2000: obs. 1 ind. (cf. Ivanova 2001). – V a r n a: Komunari, rocky labyrinth NE of the town [52], 12 July 1979: net. 1fa, 3ms, 6fj, 1 ind. (coll. 1fa, NMP 50325 [S+A]); – Varna [53], 28 July 1954: 1 ind. (ZMMU). – V e l i k o T ă r n o v o: Emen, Emenskata Peštera cave [54], 15 May 1998: obs. nurs. colony of ca. 100 ind., 27 July 1998: obs. nurs. colony of ca. 60 ind., 29 May 2000: obs. nurs. colony of ca. 20 ind. – **Published data**: B u r g a s: Mladežko [55] (Pešev 1985a); – Primorsko, Maslen Nos cape [56], July 1957 (Beron 1958), 10 August 1957 (Beron 1958), 7 August 1958 (Beron 1961), 10 July 1959 (Beron 1961), 27 June 1968 (Beron 1973a, b, 1974b), 26 July 1968 (Beron 1970), summer months: ca. 500 ind. (mixed colony with middle-sized *Rhinolophus* sp.) (Beškov 1993, Beshkov 1998); – Strandja-Balkan [= Strandža Mts.], large cave [*57*], 1935: 1f (Heinrich 1936). – J a m b o l: Goljam Dervent hills [58], small caves, 1 April 1971: 6 ind. (Pešev 1985a, Pandurska 2000); – Ustrem, Sveti Duh [Sveta Troica] monastery, Bozkite cave [13], 7 July 1959: obs. nurs. colony of ca. 200 ind. (Beron 1961, 1962, 1964b), 1958–1970: significant colony (up to one hundred ind.) (Beškov 1993, Beshkov 1998); – Voden [59] (Pešev 1985a). – L o v e č: Bežanovo, Parnicite cave [18], 30 June 1996: 100f (Pandurska 2000), rocky complex, 14 May 1997: 500 ind. (Pandurska 2000).– P a z a r d ž i k: Peštera, Snežanka cave [28], 14 and 15 Dec. 1961: 2 ind. (Beškov & Beron 1962, cf. Jančev & Stojkova 1973); – Peštera, Ušatovi [Dupki] caves [29], 31 July 1989: colony of ca. 50 ind. (Grimmberger 1993). – P l e v e n: Reselec, Temnata Dupka cave [60] (Pešev 1985a, Beškov 1993, Beshkov 1998); – Sadovec, Gininata Peštera cave [61], 29 June 1996: 100faL (Pandurska 2000). – R a z g r a d: Krivnja, Božkova Dupka cave [39], March 1989: several ind. (Beškov 1993, Beshkov 1998). – S l i v e n: Sliven, Zmejovi Dupki cave [42], 120 ind. (Beron 1958, cf. 1973b). – S o f i j a: Beledie Han, Kolibata cave [62], 24 June 1995: 3faL (Pandurska 2000), 1991–1998 (Pandurska & Beshkov 1998a); – Ginci, Dinevata Pešt cave [63] [4 Sept. 1994: net. 1ma (NMNHS 153)] (Pandurska et al. 1999), 1991–1998 (Pandurska & Beshkov 1998a); – Iskrec, Dušnika cave [64], 25 June 1998: 4faL (Pandurska 2000), 1991–1998 (Pandurska & Beshkov 1998a); – Komštica, Goljama Balabanova cave [65], 3 Sept. 1994: 1m (Pandurska 2000), 1991–1998 (Pandurska & Beshkov 1998a); – Lakatnik, Suhata Peštera (= Ražiškata Peštera) cave [66], 3 Jan. 1962 (Dusbábek 1964a, Beron & Gueorguiev 1967); – Lipnica, Boženiški Urvič [67], 1991–1998 (Pandurska & Beshkov 1998a); – Lipnica, Kozarnika cave [68], 29 July 1995: 1fj (Pandurska 2000), 28 June 1996: 8faL (Pandurska 2000), 10 July 1997: 30faL (Pandurska 2000), 1991–1998 (Pandurska & Beshkov); – Lipnica, Vodnata Pešt cave [69], 5 May 1971 (Beron 1973a, b, 1974b). – V e l i k o T ă r n o v o: Emen, Emenskata Peštera cave [54], summer 1984 (Ivanov 1985). – V i d i n: Dolni Lom, Levi Suhi Peč cave [70], 14 July 1960: obs. nurs. colony (Beron 1961, 1962); – Dolni Lom, Vodni Peč cave [71], 14 July 1960: obs. nurs. colony (Beron 1961, 1962). – V r a c a: Liljače, Božija Most cave [72], 10–11 July 1986: obs. nurs. colony of ca. 50 ind. (Grimmberger 1993), 28 July 1989: obs. nurs. colony of ca. 50 ind. (Grimmberger 1993); – Ljutadžik, Sokolskata Peštera cave [73], 27 June 1998 (Pandurska 2000), 1991–1998 (Pandurska & Beshkov 1998a).

DISTRIBUTIONAL STATUS (Fig. 11). In comparison with other countries, *M. emarginatus* is a common bat in Bulgaria (73 localities; Tab. 11) and its records are dispersed almost proporationally in all regions of the country. The core of its distribution is in karstic areas at low and medium altitudes, as demonstrated already by Pandurska (2000). Mass aggregations were found from the sea level up to 400–500 m a. s. l., records from higher elevations are rare and concern individuals netted at cave entrances or found hibernating (highest altitudinal records: Rila Mts. ca. 1600 m, Western Balkan Mts. ca. 1500 m, Central Balkan Mts. ca. 1600 m, Rhodopes Mts. 1540 m a. s. l.). The winter records of *M. emarginatus* were quite a rare (four cases only) while, in contrast, at least 30 breeding colonies were repeatedly recorded. Their size varied from 20 to 7000 individuals, the colonies amounting several hundreds individuals were not exceptional. In most cases, the colonies roosted in caves and mines, rarely also in roost of an other type (such as a building near Primorsko with a colony of 2700 ind.). The altitudinal span of breeding colonies varies from the sea level up to ca. 700 m (cf. Pandurska 2000). *M. emarginatus* was regularly recorded in colonies as an admixed element in colonies of medium-sized horseshoe bats, *Rhinolophus ferrumequinum* and, less frequently also with other cave-dwelling bat species of the genera *Myotis* and *Miniopterus*. *M. emarginatus* is one of two bat species in the Red Data Book of Bulgaria (Pešev 1985a) though it undoubtedly does not belong to the particularly rare species.

Although number of records is much smaller than in Bulgaria, *M. emarginatus* has also been considered abundant in Greece (Hanák et al. 2001) and Turkish Thrace (Karataş & Özgül 2003), large colonies with 500–1000 individuals were recorded also in Macedonia (Kryštufek et al. 1992) and Albania (Hanák 1964). The whole Balkan Peninsula can be considered an important part of distribution range of this Mediterranean species and, according to the number of records, Bulgaria is of particular importance in this respect (cf. Topál 2001). External and cranial dimensions of examined specimens of *M. emarginatus* from Bulgaria are shown in Tab. 5.

Myotis mystacinus (Kuhl, 1817) s. l.

Records. **Original data**: B l a g o e v g r a d: General Todorov, Pčelina hill, gallery, 23 July 1995: net. 1m (leg. J. Sádlová); – Goce Delčev, small pond in a town park, 15 July 1982: net. 1fs, obs. colony of ca. 10 ind. – M o n t a n a: Gorna Bela Rečka, gallery, 4 April 1995: obs. 1ma (leg. V. Beškov & R. Pandurska), 14 April 1998: obs. 1ma. – P l e v e n: Muselievo, over Osăm river, 26 June 2001: net. 1faG. – P l o v d i v: Dobrostan, Ivanova Voda cave, 20 May 1998: obs. 1ma; – Kalofer, Raj hut, Rogačevata cave, 17 August 1997: net. 1mj (cf. Ivanova 1998, Beron et al. 2000a); – Kărnare, Mazata cave, 3 Nov. 1997: obs. 1m (leg. P. Beron & V. Beškov, cf. Ivanova 1998, Beron et al. 2000a). – S o f i j a: Borovec, 1 August 1951: coll. 1mj (NMNHS, leg. P. Popov); – Ginci, Dinevata Pešt cave, 22 Sept. 1991: net. 1ma, 23 Jan. 1994: obs. 1ma (cf. Pandurska & Beshkov 1998a, Pandurska et al. 1999); – Sofija, 9 May 1938: coll. 1fa (leg. B. Petrov, NMNHS), 17 Sept. 1938: coll. 1 ind. (NMNHS, leg. B. Kitanov), Sofija, Vranja park, 26 August 1916: coll. 1ma (NMNHS). – Š u m e n: Šumen, Zandana cave, 23 Jan. 2000: obs. 1fa (cf. Ivanova 2001). – S t a r a Z a g o r a: Tăža, Dzendema reserve, small caves, 29 August 1997: net. 2 ind. (leg. V. Beškov & R. Pandurska, cf. Ivanova 1998, Beron et al. 2000a). – **Published data**: B l a g o e v g r a d: [Černa Mesta], Sofanica river valley, 1200–1300 m a. s. l. (Beron et al. 2000b). – P l o v d i v: Sadovo, behind tree bark, 18 July 1913: 1f (Bureš 1917, Kovačev 1925). – S m o l j a n: Lăki, rocks in the valley bellow the town, 27 April 1985: 1 ind. (from owl pellets) (Obuch & Benda 1996). – S o f i j a: Buhovo, Murgaš peak, building, 1991–1998 (Pandurska & Beshkov 1998a); – Cerovo (Pešev & Boev 1962); – Ginci, four caves, winter census 1991–1994: 1 ind. (Pandurska et al. 1999); – Iskrec, Dušnika cave, 1991–1998 (Pandurska & Beshkov 1998a); – Komštica, Balabanova Dupka cave, 27 April 1966: 1 ind. (Beron & Guéorguiev 1967, Beron 1968, Jančev & Stojkova 1973), 1991–1998 (Pandurska & Beshkov 1998a); – Kostenec, Čavča river valley, 1200–1300 m a. s. l. (Beron et al. 2000b); – Sofija, loft of the Museum building, 15 July 1931: 1f [NMNHS 178] (Hanák & Josifov 1959), 5 Sept. 1931: 1 ind. [NMNHS] (Hanák & Josifov 1959, Beron 1973a, b, 1974b). – V a r n a: Krivnja, 8 May 1958: 1ma (Bureš & Beron 1962, Pokrovskij & Ščadilov 1962), this record was assigned to *P. nathusii* by Panjutin (1968).

Myotis mystacinus (Kuhl, 1817) s. str. and *Myotis alcathoe* Helversen et Heller, 2001

Records. **Original data**: B l a g o e v g r a d: Gorna Breznica, over a brook [1], 18 July 1982: coll. 1mj (NMP 48505 [S+B]; cf. Benda & Tsytsulina 2000), 19 July 1982: net. 1fa (NMP 48507 [S+B]; cf. Benda & Tsytsulina 2000), 25 July 1994: net. 1ma, 1fj (NMP 48343, 48344 [S+A]; cf. Benda & Tsytsulina 2000); – Gorna Breznica, spring N of village [2], 14 July 1981 net. 1faL (NMP 48487 [S+B]; Benda & Tsytsulina 2000), 22 July 1981: net. 1mj (NMP 48501 [S+B]; cf. Benda & Tsytsulina 2000), 15 July 1982: net. 1faL (NMP 48504 [S+B]; cf. Benda & Tsytsulina 2000). – B u r g a s: Izgrev, over a brook [3], 15 August 1971: net. 3ms (NMP 38771, 38775, 49235 [S+B]; cf. Horáček et al. 1974, Benda & Tsytsulina 2000). – D o b r i č: Durankulak [4], 10 July 1980: coll. 1fj (SMO 5221 [S]; leg. B. Beneš; cf. Benda & Tsytsulina 2000, Beneš & Hanák 2003). – K j u s t e n d i l: Rilski Manastir, Kravarski Dol [5], Ilijna Reka river, gallery, 5 July 2001: net. 1ma (NMNHS 148 [S+A]; leg. N. Simov). – S m o l j a n: Čepelare, river 1 km N of the town [6], 5 August 1971: net. 1fa (NMP 38769 [S+B]; cf. Horáček et al. 1974, Benda & Tsytsulina 2000); – Čepelare, Samurski Dupki cave [7], 1240 m a. s. l., 7 August 1971: net. 1ms (NMP 38770 [S+B]; cf. Horáček et al. 1971, 1974, Benda & Tsytsulina 2000); – Gela, Ledenica cave [8], 31 July 1971: net. 4ma, 1ms, 1fs (NMP 38762, 38763, 38767, 38768, 38772, 38773, 49233 [S+B]; cf. Horáček et al. 1971, 1974, Benda & Tsytsulina 2000), 13 August 1978: net. 2ms, 1mj (NMP 48483–48485 [S+B]; cf. Benda & Tsytsulina 2000); – Pamporovo [9], cave, 1420 m a. s. l., 8 August 1971: net. 1ms (NMP 38774 [S+B]; cf. Horáček et al. 1971, 1974, Benda & Tsytsulina 2000). – Bulgaria undef.: Bulgaria, 1948: 1fj (NMNHS 141 [S+A]). – **Published data**: R u s e: [Rusenski Lom NP], small cave [10], 1957: 1 ind. (Undžijan 1998 [as *M. cf. ikonnikovi*]). – S o f i j a: Kubratovo [= Sofija, building] [11], 1956: 1m [NMNHS] (Kvartirnikov 1957 [as *M. ikonnikovi*]).

COMMENTS. The complex of morphologically closed forms, originally classified as broadly understood *M. mystacinus* (Ellerman & Morisson-Scott 1951, Hanák 1965), has recently been split into four species, viz. *M. mystacinus* s. str., *M. brandtii*, *M. aurascens*, and *M. alcathoe* (see Helversen 1989, Benda & Tsytsulina 2000, and Helversen et al. 2001). Most of the data published so far do not allow a reliable allocation to any of the above mentioned species and, unfortunately, the same concerns some recent field data not published as yet. Here we treat such uncertain records under a separate labelling as "*M. mystacinus* s. l.". However, with respect to the present knowledge on the distribution of the respective species (Benda &Tsytsulina 2000, Helversen et al. 2001, Benda et al. 2003b, Benda in press) we can expect that most records of *M. mystacinus* s. l. may well concern *M. aurascens* which seems to be the most common species of the group in the Balkans (see below). Nevertheless, an appearance of all four species in close vicinity of Bulgaria demonstrated by recent taxonomic studies (Benda & Tsytsulina 2000, Helversen et al. 2001) suggests that they all can come in account in this country, too.

Based on morphologic and metric characters, the complex can be subdivided into two basic groups composed of either (a) large forms (*M. aurascens* and *M. brandtii*) and (b) small forms (*M. mystacinus* s. str. and *M. alcathoe*). The large forms can be well separated with aid of several morphologic characters while the small forms, in contrast, can be identified with aid of molecular genetic markers only (Ruedi et al. 2002, Benda et al. 2003b). That is why we treat each of the large forms separately below.

The records of (b) group of *M. mystacinus* s. l., i. e. the small bats belonging to either *M. mystacinus* s. str. or *M. alcathoe*, have been summarized in Fig. 12. There are 11 records from

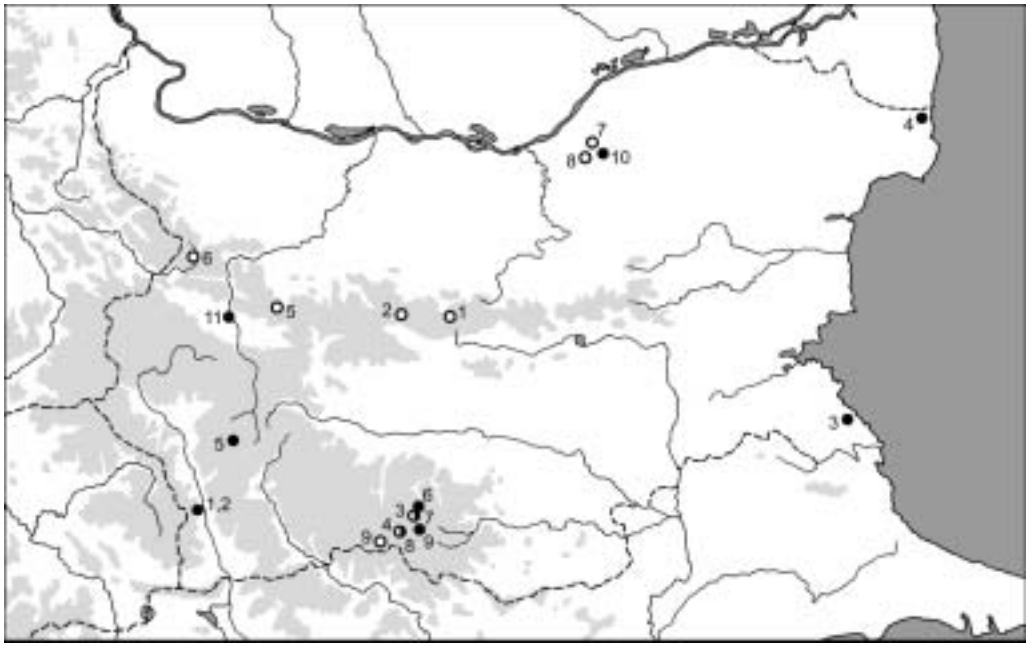

Fig. 12. Records of *Myotis brandtii* (Eversmann, 1845) (open symbols) and small individuals of the *M. mystacinus* group, i.e. *M. mystacinus* (Kuhl, 1817) or *M. alcathoe* Helversen et Heller, 2001 (closed symbols) in Bulgaria. Numbers correspond with locality numbers in the text.

mountain regions (Rila Mts., Rhodopes Mts.; up to 1600 m a. s. l.), as well as lowland and/or maritime parts of the country. The only plausible conclusion from these records is that small forms of *M. mystacinus* s. l. are less common in Bulgaria than the larger forms (*M. aurascens* and *M. brandtii*) but may occur in rather different parts of the country which corresponds to the situation in Greece (Hanák et al. 2001) or Macedonia (Benda & Tsytsulina 2000) from where the corresponding data are available. Out of the two species of the (b) group, *M. alcathoe* is more likely to be a member of Bulgaria fauna since its records in the Greek Rhodopes Mts. are only ca. 20 km distant from the Bulgarian border (Helversen et al. 2001). However, potential occurrence of *M. mystacinus* s. str. can be inferred from the presence of other boreal forest bat species such as *Myotis brandtii*, *M. daubentonii* and *Eptesicus nissonii* in the Balkans including Bulgaria.

Myotis aurascens Kusjakin, 1935

Records. **Original data**: B l a g o e v g r a d: Gorna Breznica, over a brook [1], 14 July 1982: net. 1ma (NMP 48503 [S+B]; cf. Benda & Tsytsulina 2000), 19 July 1982: net. 2fj (NMP 48506, 48507 [S+B]; cf. Benda & Tsytsulina 2000), 9 July 1983: net. 2faL (NMP 48509 [S+B], 48510 [S]; cf. Hůrka 1984a, Benda & Tsytsulina 2000), 13 July 1983: net. 1faL (NMP 48511 [S]; cf. Benda & Tsytsulina 2000), 25 July 1994: net. 1fa (NMP 48342 [S+A], cf. Benda & Tsytsulina 2000); – Gorna Breznica, village theatre [2], 15 July 1981: coll. 1ms (NMP 48488 [S+B]; cf. Hůrka 1984a, Benda & Tsytsulina 2000), 16 July 1981: net. 1ma, 1ms (NMP 48493, 48494 [S+B]; cf. Benda & Tsytsulina 2000), 20 July 1981: net. 2ma (NMP 48497, 48498 [S+B]; cf. Benda & Tsytsulina 2000); – Gorna Breznica, spring N of village [3], 15 July 1981: net. 1faL (NMP 48489 [S+B]; cf. Benda & Tsytsulina 2000), 16 July 1981: net. 2faL (NMP 48491, 48492 [S+A]; cf. Benda & Tsytsulina 2000), 22 July 1981: net. 1ma, 1fa, 1fs (NMP 48499, 48500, 48502 [S+B]; cf. Benda & Tsytsulina 2000); – Kalimanci, over Kalimanska river [4], 2 June 2002: net. 1ma (NMNHS 213 [S+A]); – Melnik, above a brook [5], 17 July 1981:

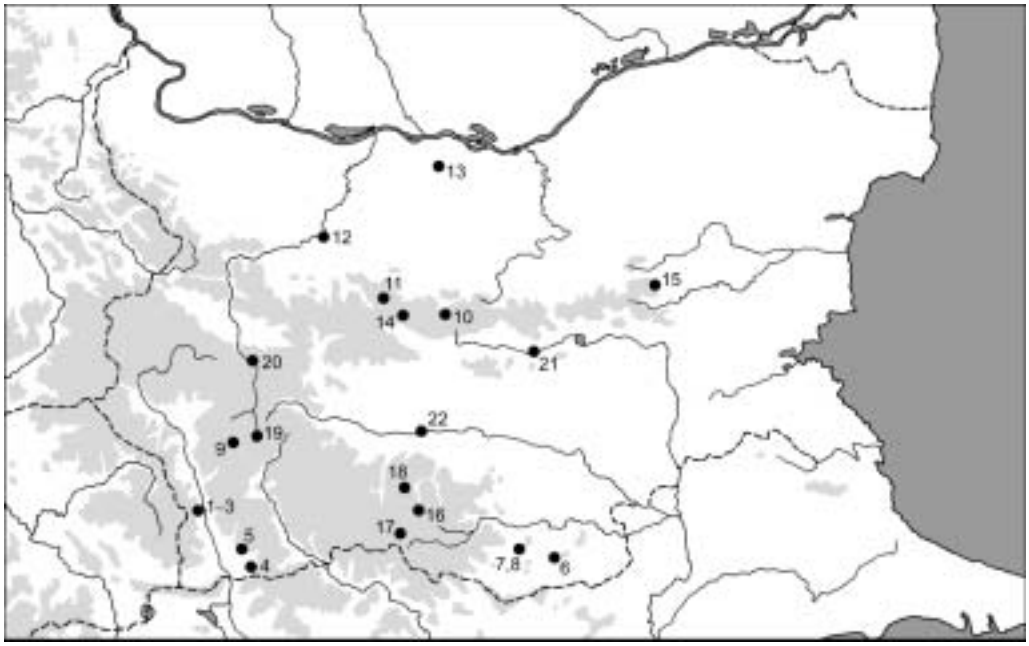

Fig. 13. Records of *Myotis aurascens* Kusjakin, 1935 in Bulgaria. Numbers correspond with locality numbers in the text.

Tab. 6. Basic biometric data for examined Bulgarian samples of *Myotis aurascens* Kusjakin, 1935, *M. brandtii* (Eversmann, 1845), and *M. daubentonii* (Kuhl, 1817). For abbreviations see p. 250

	Myotis aurascens					*Myotis brandtii*					*Myotis daubentonii*				
	n	min	max	M	SD	n	min	max	M	SD	n	min	max	M	SD
LC	23	41.0	49.0	45.1	2.181	–	–	–	–		3	40.0	47.0	44.0	3.606
LCd	22	37.0	44.0	40.7	2.147	–	–	–	–		3	32.0	39.0	36.0	3.606
LAt	36	33.1	38.0	35.0	1.034	9	34.3	35.9	35.3	0.652	3	32.6	36.0	34.6	1.778
LA	31	12.4	16.0	14.2	0.861	9	12.5	16.5	14.7	1.129	3	12.5	13.5	12.8	0.577
LTr	32	6.8	9.0	7.9	0.597	9	6.4	8.0	7.2	0.555	3	5.5	7.0	6.3	0.764
G	15	4.5	9.0	6.1	1.177	–	–	–	–		–	–	–	–	–
LCr	41	13.48	14.42	14.04	0.214	9	13.70	14.50	14.14	0.264	4	13.62	14.33	13.99	0.362
LCb	39	12.88	13.67	13.30	0.207	9	12.93	13.73	13.41	0.232	4	12.67	13.78	13.23	0.453
LaZ	31	8.08	8.75	8.50	0.169	6	8.23	8.83	8.55	0.216	3	8.35	9.04	8.66	0.349
LaI	41	3.15	3.65	3.43	0.123	9	3.47	3.82	3.60	0.102	4	3.76	3.91	3.85	0.070
LaN	41	6.44	7.18	6.82	0.170	9	6.68	7.05	6.92	0.130	4	7.01	7.91	7.42	0.373
AN	41	4.57	5.20	4.89	0.147	9	4.50	4.82	4.65	0.125	4	4.98	5.62	5.28	0.269
CC	40	3.17	3.67	3.48	0.111	9	3.17	3.52	3.35	0.120	4	3.42	3.67	3.57	0.105
M^3M^3	41	5.08	5.62	5.41	0.132	9	5.02	5.47	5.32	0.131	4	5.18	5.58	5.44	0.177
CM^3	41	4.94	5.42	5.20	0.103	9	5.28	5.52	5.41	0.078	4	4.72	5.22	4.97	0.269
LMd	40	9.62	10.28	9.91	0.172	9	9.62	10.30	10.02	0.240	4	9.38	10.37	9.93	0.427
ACo	40	2.54	3.12	2.82	0.105	9	2.65	2.82	2.73	0.059	4	2.72	2.92	2.83	0.083
CM_3	40	5.43	5.92	5.63	0.120	9	5.62	5.95	5.76	0.107	4	5.06	5.72	5.34	0.331

net. 1faL, 1fs (NMP 48495, 48496 [S+A]). – K ă r d ž a l i: Krumovgrad, Krumovica river [6], bridge, 3 Oct. 2003: net. 1fa, 1fj (leg. R. Lučan); – Momčilgrad, river bank [7], May 1978: coll. 1fa (NMP 48480 [S+A]; cf. Benda & Tsytsulina 2000); – Momčilgrad, over a water pool [8], 17 June 1977: net. 1fa (NMP 48479 [S+A]; Benda & Tsytsulina 2000). – K j u s t e n d i l: Rilski Manastir, Kravarsko Dere [9], Ilijna Reka river, 28 June 2001: net. 3ma (NMNHS 149–151 [S+A]; leg. N. Simov). – L o v e č: Aprilci, Vodnite Dupki cave [10], 15 August 1997: net. 6m, 1fj (coll. 2ma, NMNHS 116, 117 [S]; cf. Ivanova 1998, Benda & Tsytsulina 2000, Beron et al. 2000a); – Čiflik, Hajduška Pesen hut [11], gallery, 2 Nov. 1997: coll. 1ma (NMNHS 167 [S+A]; leg. P. Beron & V. Beškov, cf. Ivanova 1998, Beron et al. 2000a); – Karlukovo, ridge of a rocky amphitheatre [12], 8 August 1978: net. 1ma (NMP 48481 [S+B]; cf. Benda & Tsytsulina 2000). – P l e v e n: Debovo, bridge on the road Debovo–Ljubenovo [13], 30 June 2001: coll. 1ma (NMNHS 180 [S+A]). – P l o v d i v: Hristo Danovo, Mazata cave [14], 25 Sept. 1997: coll. 1ma (NMNHS 138 [S]; cf. Benda & Tsytsulina 2000). – S l i v e n: Kotel, over a brook (near Nirica cave) [15], 14 July 1979: net. 1ma (NMP 48486 [S+B]; cf. Benda & Tsytsulina 2000). – S m o l j a n: Čepelare, Samurski Dupki cave [16], 7 August 1971: net. 1ms (NMP 38778 [S+B]; cf. Horáček et al. 1971, 1974, Benda & Tsytsulina 2000); – Gela, Ledenica cave [17], 31 July 1971: net. 1ma (NMP 38767 [S+B]; cf. Horáček et al. 1971, 1974, Hůrka 1976, Benda & Tsytsulina 2000); – Orehovo, Modarskata Peštera cave [18], 26 Sept. 1994: net. 1ma (NMNHS 011 [S]; cf. Benda & Tsytsulina 2000). – S o f i j a: Beli Iskar, building near Beli Iskar dam [19], 1900 m a. s. l., 16 July 1994: coll. 1ma (NMNHS 092 [S]; leg. V. Beškov, cf. Benda & Tsytsulina 2000, Beron et al. 2000b); – Pasarel [20], Iskar river, 18 August 1994: net. 1fa, 1ms (NMNHS 094, 095 [S]; cf. Benda & Tsytsulina 2000). – S t a r a Z a g o r a: Gara Tulovo [21], 24 May 1957: coll. 1fa (NMP 48478 [S]; leg. M. Josifov, cf. Hanák & Josifov 1959, Benda & Tsytsulina 2000). – **Published data**: P l o v d i v: Plovdiv, E of the town [22], 3 Sept. 1935: 1fa [BZM 47264 (S+B), holotype specimen of *M. mystacinus bulgaricus* Heinrich, 1936] (Heinrich, 1936, Benda & Tsytsulina 2000), 10 Sept. 1935: 2ma [MTD B13208 (S+B), NMNHS] (Heinrich 1936, Feiler 1999 [as *M. m. bulgaricus*]; Benda & Tsytsulina 2000), 21 Sept. 1935: 2ma [BZM 47265, 47266 (S+B)] (Heinrich 1936 [as *M. m. bulgaricus*]; Benda & Tsytsulina 2000).

DISTRIBUTIONAL STATUS (Fig. 13). *M. aurascens* has only recently been defined as a species different from *M. mystacinus* (Benda & Tsytsulina 2000) and its distributional range as a whole is still subject to further research. According to present data (Benda in press), north-Bulgarian records of the species represent a part of its northern margin of distribution in Europe. The border leads from Dalmatia through Montenegro, Kosovo and Macedonia to western Bulgaria (Rila and Vitoša Mts.) and further north-eastwards along the Iskar River valley up to Debovo (in the Pleven Dist.), which

is the most northerly situated locality known so far in the Balkans. *M. aurascens* has not yet been found in Romania but it is known from Moldavia and Ukraine (Benda & Tsytsulina 2000, Benda in press).

The hitherto records (22 localities; Tab. 11) confirm the assumption of Benda & Tsytsulina (2000) that *M. aurascens* is the most common from the four species of the *M. mystacinus* morphocomplex in the Balkans. Although most records come from mountains and highlands, the species seems to inhabit the whole territory of Bulgaria. The biogeographic classification of *M. aurascens* as a steppe or a forest-steppe element (Benda & Tsytsulina 2000) has yet to be elucidated. Generally, the situation is similar to that in continental Greece with 19 localities (Hanák et al. 2001) or Macedonia with at least nine localities (Benda & Tsytsulina 2000). External and cranial dimensions of examined specimens of *M. aurascens* from Bulgaria are shown in Tab. 6.

NOTE. From central Bulgaria, Heinrich (1936) described *M. mystacinus bulgaricus* (terra typica: "östl. von Plovdiv"). Later on, Hanák (1965) synonymized that name with the nominotypic form *M. mystacinus mystacinus*. However, according to the revision by Benda & Tsytsulina (2000), *M. m. bulgaricus* is a junior synonym of *Myotis mystacinus aurascens* Kusjakin, 1935. Therefore, Heinrich's records together with the records of "*M. mystacinus brandtii*" by Martino (1932) from Macedonia, have been the first confirmed findings of *M. aurascens* in the Balkans (Benda 1999).

Myotis brandtii (Eversmann, 1845)

RECORDS. **Original data**: L o v e č: Aprilci, Vodnite Dupki cave [1], 15 August 1997: net. 3m (cf. Ivanova 1998, Beron et al. 2000a). – P l o v d i v: Kărnare, Mazata cave [2], 25 Sept. 1997: coll. 1ma (NMNHS 120 [S]; cf. Ivanova 1998, Benda & Tsytsulina 2000, Beron et al. 2000a), 3 Nov. 1997: 1ma (NMNHS 138 [S]; leg. P. Beron & V. Beškov, cf. Ivanova 1998). – S m o l j a n: Čepelare, Samurski Dupki cave [3], 7 August 1971: net. 1ms (cf. Horáček et al. 1971, 1974); – Gela, Ledenica cave [4], 31 July 1971: net. 4ma, 1ms (NMP 38764–38766, 38776, 38777 [S+B], cf. Horáček et al. 1971, 1974, Benda & Tsytsulina 2000), 12 August 1978: net. 1ma (NMP 48482 [S+A]; cf. Benda & Tsytsulina 2000). – S o f i j a: Buhovo, Murgaš hut [5], 3 August 1994: obs. nurs. colony of ca. 20 ind., net. 1mj, 1fj (NMNHS 096, 097 [S]; cf. Ivanova 1998, Benda & Tsytsulina 2000); – Ginci, Dinevata Pešt cave [6], 22 Sept. 1991: net. 2ma (cf. Pandurska & Beshkov 1998a, Pandurska et al. 1999). – **Published data**: R u s e: Košov [7], cave, 12 May 1991: net. (Undžijan 1998); – Pepelina, Orlova Čuka cave [8], 7 Jan. 1991 (Undžijan 1998). – S m o l j a n: Čairska Reka river [9], 950 m, 11 August 1994: net. 1 ind. (Pandurska & Beshkov 1998b).

DISTRIBUTIONAL STATUS (Fig. 12). Shortly after discovery of a separate species status of *M. brandtii* (Hanák 1970, Gauckler & Kraus 1970), Horáček et al. (1971, 1974) recorded several individuals of this species in the Rhodopes Mts. This was the first record of *M. brandtii* in Bulgaria and even in the Balkans, including all the museum specimens previously identified as *M. mystacinus*. Since that time the number of well identified records increased to nine, including the record of a maternity colony in a chalet ca. 1400 m a. s. l. (Ivanova 1998). *M. brandtii* thus seems to be a regular member of Bulgarian bat fauna. However, all the records are confined to forest enclaves in mountainous areas (Rhodopes Mts., Balkan Mts.) within 950–1540 m a. s. l. (mean altitude 1130 m a. s. l.). According to the present knowledge, these boreal enclaves represent the southern border of the species distribution in Europe. The records published by Undžijan (1998) from the Danubian Lowland need revision due to possible confusion with several other *Myotis* species and an unlikeliness of occurrence of *M. brandtii* in habitats of the Danubian floodplain. Except the records by Pandurska & Beshkov (1998a, b), specimens collected in Bulgarian mountains were morphologically reexamined and their allocation to *M. brandtii* confirmed.

In contrast to multiple records of *M. brandtii* in Bulgaria, in some of the Balkan countries (Greece, Albania, Macedonia, Serbia) the species has never been found or it was found quite a rare in others (Romania, Montenegro, Croatia) (Grimmberger 1993, Benda & Tsytsulina 2000, Borda

1999, Gheorghiu et al. 2001, cf. Rauschert 1963). External and cranial dimensions of examined specimens of *M. brandtii* from Bulgaria are shown in Tab. 6.

Myotis daubentonii (Kuhl, 1817)

Records. **Original data**: B l a g o e v g r a d: Gorna Breznica [1], 16 July 1981: net. 1m (NMP 48490 [S]). – B u r g a s: Gramatikovo, Kačul [2], over Veleka river, 20 August 1999: net. 1ma (NMNHS 161, leg. B. Milčev); – Izgrev [3], over a brook, 15 August 1971: net. 1ms (NMP 50160 [S+B]; cf. Horáček et al. 1974); – Kosti, Maharata cave [4], 8 Jan. 2000: obs. 1fa; – Mladežko [5], 25 August 1999: net. 1ma; – Zvezdec [6], over Veleka river, 22 August 1999: net. 1ma, 1fa. – D o b r i č: Albena [7], sea shore, river mouth, 21 August 1983: net. 1ma, 1ms. – G a b r o v o: Skalsko [8], Rosica river, bridge, 24 June 1995: obs. 1ma. – H a s k o v o: Dolno Lukovo [9], over the Bjala Reka river, 11 June 1999: net. 2fa (1fa with 1mj). – L o v e č: Aprilci, Vodnite Dupki cave [10], 15 August 1997: net. 2ma (cf. Ivanova 1998, Beron et al. 2000a); – Bežanovo, Parnicite cave [11], 16 Dec. 1995: coll. 1ma (NMNHS 044), 20 Jan. 1996: obs. 1 ind.; – Devetaki, Devetaškata Peštera cave [12], 20 May 1999: net. 2ma (leg. C. Dietz), 25 June 2001: obs. 2 ind; – Divčovoto, Boroveška Dupka cave [13], 29 Sept. 1997: obs. 1fa (cf. Ivanova 1998, Beron et al. 2000a). – S i l i s t r a: Onogur, Ergele Peštera cave [14], 20 April 2001: net. 3fa. – S m o l j a n: Gela, Ledenica cave [15], 1650 m a. s. l., 13 August 1978: net. 1ma (NMP 50172 [S+B]). – S o f i j a: Berende Izvor, Temnata Dupka cave [16], 2 March 1991: obs. 1fa; – Ginci, Dinevata Pešt cave [17], 23 Jan. 1994: obs. 1fa. – S t a r a Z a g o r a: Tăža, Dzendema reserve [18], small caves, 29 August 1997: net. 1 ind. (leg. V. Beškov & R. Pandurska, cf. Ivanova 1998, Beron et al. 2000a). – Š u m e n: Šumen, Zandana cave [19], 23 Jan. 2000: obs. 20 ind. (cf. Ivanova 2001), 10 Sept. 2000: obs. 1ma. – **Published data**: B u r g a s: Burgaskite Ezera lakes [20], Sept.–Oct. 2002 (Pandurski 2003). – K j u s t e n d i l: Pastra, Rilska Reka valley, Krusta [= Krăsta] rock [21], 700 m a. s. l. (Beron et al. 2000b). – L o v e č: Karlukovo, Zadănen Dol near Prohodna cave [22], summer 1988: 1 ind. (Popov & Ivanova 1995); – Krušuna, Uruška Maara cave [23], 24 July 1959: 1 ind. juv. (Beron 1961, 1962). – M o n t a n a: Gorna Bela Rečka [24], gallery, 1991–1998 (Pandurska & Beshkov 1998a). – P l e v e n: Muselievo, Nanin Kamăk cave [25], 28 Jan. 1971 (Beron 1972); –

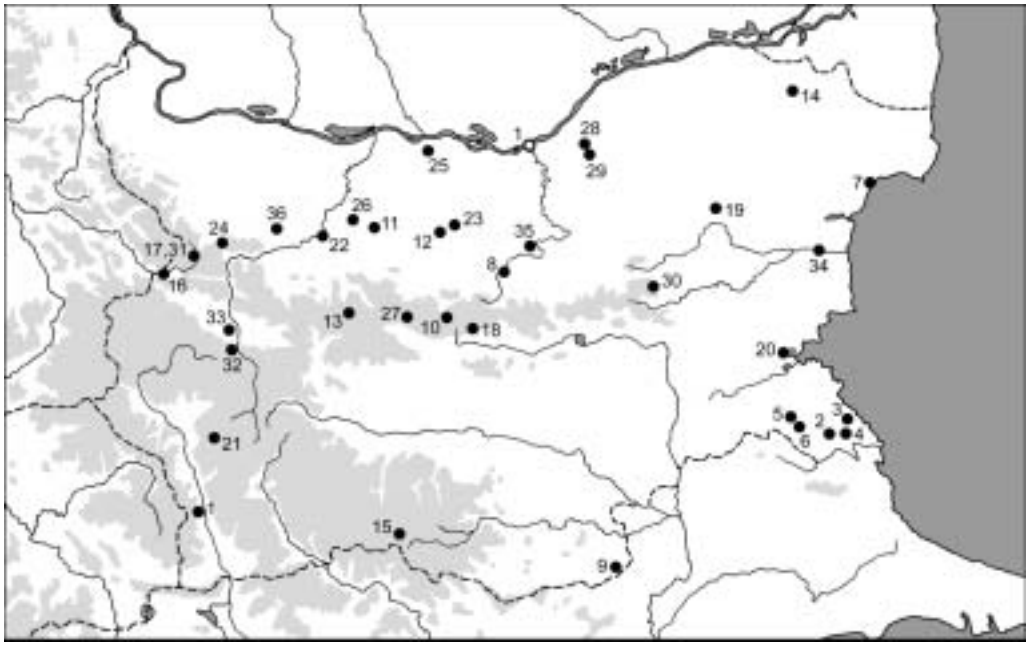

Fig. 14. Records of *Myotis daubentonii* (Kuhl, 1817) (closed symbols) and *M. dasycneme* (Boie, 1825) (open symbol) in Bulgaria. Numbers correspond with locality numbers in the text.

Rakita, Sedlarkata cave [26], July 1988: ca. 20 ind. (Beškov 1993, Beshkov 1998). – P l o v d i v: Kărnare, Trojanski Prohod pass, Mazata cave [27] (Beron et al. 2000a). – R u s e: Košov [28], cave, Sept. 1991: net. 1 ind. (Undžijan 1998); – Červen [29], cave, Sept. 1991: net. 1 ind. (Undžijan 1998). – S l i v e n: Kotel, Orlovata Peštera cave [30], 1 ind. (Beron 1961, 1962). – S o f i j a: Ginci, Dinevata Pešt cave [17], winter census 1991–1994: 1 ind. (Pandurska et al. 1999), 1991–1998 (Pandurska & Beshkov 1998a); – Ginci, Krivata Pešt cave [31], 20 Nov. 1963: 1 ind. (Jančev & Stojkova 1973); – Kokaljane, Urvič [32], Lozenska Planina Mts., gallery, 5 April 1959: 1m (Beron 1961); – Sofija [33], loft of the museum building, 20 May 1932: 1 ind. [NMNHS 198] (Hanák & Josifov 1959, Beron 1974b). – V a r n a: Kamčija river [34], 1935: 1m (Heinrich 1936). – V e l i k o T ă r n o v o: Beljakovec, Carskata Peštera cave [35], March 1988: ca. 20 ind. (Beškov 1993, Beshkov 1998). – V r a c a: Kalen, Kalenska Pešt cave [36], 8 Sept. 1959: 1f (Beron 1961, 1962).

DISTRIBUTIONAL STATUS (Fig. 14). Heinrich (1936) was the first who published a record of *M. daubentonii* in Bulgaria, in the valley of the Kamčija River. It was one of the first records of the occurrence of this species in the Balkans. Three records were obtained in the second half of the 20th century (Hanák & Josifov 1959, Beron 1961, Horáček et al. 1974) and with essential contribution from the recent decade the total number of records grew to 36 (Tab. 11). A conspisuous increase in number of records since eighties can be well correlated with rapid population increase of this species in central Europe (Řehák 1997). Most of the Bulgarian records resulted of mist netting over water bodies and/or at cave entrances in the late summer period while only six winter records are available and no summer colony was discovered as yet. The records from low altitudes of the Predbalkan area and maritime regions predominate while those from the mountain areas (Rila Mts., Rhodopes Mts., Balkan Mts.) are apparently less frequent. Altitudinal distribution ranges from the sea level up to 1650 m a. s. l. (Ledenica cave in Rhodopes Mts.). Records of netted individuals in river valleys at different elevations (rivers of Iskar, Veleka, Rosica, Kamčija, Rilska reka, Bjala reka, etc.) correspond to the known trophic strategy of the species (scanning the water surface) and it is probable that its summer roosts are in trees within the riverine forests. Interestingly, the species was also found in the attic of a museum in Sofia (Hanák & Josifov 1959).

In conclusion, *M. daubentonii* is undoubtedly a resident species in Bulgaria that is neither too common but at the same time not very rare. As in other dendrophilous species the current knowledge of its distributional status is apparently incomplete. The souther Bulgarian records closely neighbouring the marginal records of the species' range in northern Greece (Helversen & Weid 1990, Hanák et al. 2001) and Turkish Thrace (Benda & Horáček 1998). Nevertheless, close to them the densities of local populations may be quite a high as evidenced in the humid region around the Prespa Lakes on the Albanian, Macedonian and Greek sides (Helversen & Weid 1990, Kryštufek et al. 1992, Chytil & Vlašín 1994, Uhrin et al. 1996a). External and cranial dimensions of examined specimens of *M. daubentonii* from Bulgaria are shown in Tab. 6.

Myotis dasycneme (Boie, 1825)

RECORD. **Published datum**: R u s e: Krivina, over the Dunav river [1], 30 Sept. 1999: det. one hunting ind. (Limpens 2000).

DISTRIBUTIONAL STATUS (Fig. 14). The only datum suggesting appearance of *M. dasycneme* in Bulgaria is a field observation of an individual over the Danube River near Ruse recorded by means of ultrasonic detector (Limpens 2000). This is not only the first record of this species in Bulgaria but also the southernmost record of *M. dasycneme* in Europe and probably in its whole distribution range (Horáček & Hanák 1989, Roer 2001). The nearest resident populations of this species are (1) in Pannonia (Horáček & Hanák 1989), which size seems to increase during the last decade (Matis et al. 2000) and which range extends at least into the south-eastern Hungary and south-western Romania, where the species also has recently been found (Borda 1999, Gheorghiu et al. 2001), and

(2) in Moldavia where *M. dasycneme* ranks among quite common species (cf. Skvorcov & Dorošenko-Kučuk 1974, Horáček & Hanák 1989). Until now, no records are available from Romanian Dobrogea and/or the Danube delta region which both could be considered candidate areas of distribution for this species. Thus, under the present state of knowledge, the Bulgarian record is quite isolated and until further records will be obtained the actual status of the species in Bulgaria cannot be properly estimated. Further data, including those mediating an other line of evidence than a detectoring record are urgently needed (cf. Limpens 2001).

Myotis capaccinii (Bonaparte, 1837)

Records. **Original data**: B l a g o e v g r a d: General Todorov, Pčelina hill [1], gallery, 20 Dec. 2002: obs. 2 ind. (coll. 1ma, NMP 50443 [A]); – Gorna Breznica [2], water spring N of village, 22 July 1981: net. 1faL (NMP 50175 [S+B]). – B u r g a s: Černomorec [3], rocky sea shore, 13 July 1987: net. 1ms; – Mladežko, Lejarnicite cave [4], 25 August 1999: net. 1ma, 3 Jan. 2000: obs. 1 ind.; – Primorsko, Maslen Nos cape, cave [5], 5 June 1957: obs. large colony, coll. 2ma, 9fa (NMP 49189, 49210, 49211, 49224, 49340, 49344 [S+A], 49190, 49193, 49208, 49209, 49223 [S+B]; cf. Hůrka 1958, Hanák & Josifov 1959), 27 August 1961: coll. 1fs (IVB 1 [S+B]); – Primorsko, Maslen Nos cape, Tjulenovata Peštera cave [6], 16 July 1998: obs. nurs. colony of ca. 300 ind. – G a b r o v o: Armenite, Černata Peštera cave [7], 26 July 1998: obs. 1ma; – Drjanovo, Andăka cave [8], 27 July 1998: obs. nurs. colony of ca. 30 ind., 20 Jan. 2000: obs. 5 ind.; – Jantra, Prilepnata Peštera cave [9], 24 June 1995: obs. nurs. colony of ca. 100 ind. – H a s k o v o: Careva Poljana [10], 7 Oct. 2003: obs. and det. several ind. (leg. R. Lučan); – Lozen, gallery (betw. Lozen and Černa Mogila) [11], 12 April 1998: obs. 1fa; – Madžarovo, gallery [12], 11 May 1996: net. 1fa, 28 Oct. 2002: obs. 9 ind. (exam. 1fa, 1fs; leg. R. Lučan), 28 Sept. 2003: net. 1ma, 3fa (leg. R. Lučan). – J a m b o l: Melnica, Vodnata Drănči Dupka cave [13], 25 Nov. 1997: obs. 150 ind., 18 July 1998: net. 20ma, obs. nurs. colony of ca. 200 ind., 2 Jan. 2000: obs. 480 ind., 30 June 2000: obs. colony of ca. 500 ind.; – Ustrem, Bozkite cave [14], 10 April 1998: net. 6 ind. – K ă r d ž a l i: Malko Kamenjane [15], Krumovica river, 4 Oct. 2003: net. 1mj (leg. R. Lučan); – Orešari, Karangin cave [16], 27 April 1996: net. 3ma, 9fa (cf. Ivanova 1997), 29 Sept. 1996: net. 1ma (cf. Ivanova 1997), 29 April 1997: obs. (cf. Ivanova 1997), 14 July 1997: obs. (cf. Ivanova 1997), 17 May 1998: obs., 17 June 1998: obs., 20 July 1998: net. 10 ind., obs. nurs. colony, 11 April 1999: obs. 130 ind., 3 July 1999: net. 50 ind., obs. nurs. colony, 17 June 2000: obs. 10 ind.; – Ribino, Aina Ini cave [17], 22 July 1998: trap. 20 ind., 4 March 1999: obs. 3 ind., 11 Sept. 2000: net. 10 ind., 15 Sept. 2001: net. 1ma; – Ribino, Samara cave [18], 29 Sept. 2002: obs. ca. 100 ind.; – Visoka Poljana, Jarasă-Ini cave [19], 31 March 1991: obs. 10 ind. (cf. Ivanova 1997), 16 Nov. 1991: obs. ca. 100 ind. (cf. Ivanova 1997), 12 August 1995: obs. ca. 100 ind. (cf. Ivanova 1997), 11 Oct. 1995: obs. 20 ind. (cf. Ivanova 1997), 19 Oct. 1995: obs. 130 ind. (cf. Ivanova 1997), 6 May 1996: obs. 2ma, 2fa (cf. Ivanova 1997), 18 Sept. 1996: obs. ca. 200 ind. (cf. Ivanova 1997), 5 Jan. 1997: obs. 20 ind. (cf. Ivanova 1997), 28 April 1997: obs. (cf. Ivanova 1997), 15 July 1997: obs nurs. colony of ca. 500 ind. (cf. Ivanova 1997), 22 Nov. 1997: obs. ca. 100 ind. (cf. Ivanova 1997), 17 May 1998: obs. ca. 500 ind., 23 July 1998: obs. nurs. colony of ca. 1000 ind., 13 Oct. 1998: obs ca. 250 ind., 5 July 1999: obs. 10 ind., 20 June 2000: obs. nurs. colony of ca. 6000 ind. – L o v e č: Bežanovo, Parnicite cave [20], 12 May 1990: obs., 11 Nov. 1990: obs. ca. 5000 ind., 14 Dec. 1990: obs. ca. 7000 ind., 21 Jan. 1995: obs. ca. 8000 ind., 20 Jan. 1996: obs. ca. 12,000 ind., 28 Jan 1998: obs. ca. 10,000 ind., 5 Dec. 1999: obs. ca. 50,000 ind., 26 May 2000: obs. colony of ca. 300 ind., 13 Jan. 2002: obs. ca. 22,000 ind.; – Čavdarci, Mandrata cave [21], 25 June 2001: obs.; – Devetaki, Devetaškata Peštera cave [22], 2 Nov. 1996: obs. ca. 300 ind., 1 Febr. 1997: obs. ca. 1000 ind., 24 Febr. 1998: obs. 1 ind., 15 May 1998: obs. 10 ind., 20 May 1999: net. 41ma, 27fa, obs. nurs. colony (leg. C. Dietz), 7 Nov. 1999: obs. 60 ind., 19 Jan. 2000: obs. ca. 2000 ind., 14 July 2000: obs. nurs. colony of ca. 1000 ind., 24 Sept. 2000: obs. ca. 100 ind., 7 June 2001: obs. nurs. colony of ca. 500 ind., 25 June 2001: coll. 1fj (NMNHS 174), 12 Jan. 2002: obs. ca. 3000 ind.; – Dragana, Skoka cave [23], 8 April 1995: obs. ca. 500 ind., 22 March 1997: obs. 140 ind.; – Gložene, Ljastovicata cave [24], 30 April 1999: net. 1ma, 1fa; – Gložene, Morovica cave [25], 25 Febr. 1998: obs. ca. 100 ind.; – Goljama Željazna, Toplja cave [26], 2 Febr. 1997: coll. 1ma (NMNHS 100), 28 June 1998: obs. 10 ind.; – Karlukovo, ridge above rocky amphitheatre [27], 12 June 1977: net. 1fa (NMP 49442 [S+A]; cf. Kučera 1979), 6 August 1978: net. 1fa (NMP 49742 [S+A]); – Karlukovo, Bankovica cave [28], 7 Febr. 1965: coll. 1ma (IVB 3 [S+B]; cf. Hůrka 1984a); – Karlukovo, Troevratica cave [29], 21 May 2000: obs. 1 ind.; – Krušuna, Uruška Maara cave [30], 30 July 1998: obs. nurs. colony of ca. 1500 ind., 18 May 1999: obs. nurs. colony of ca. 500 ind. (leg. N. Simov), 7 June 2001: obs. nurs. colony of ca. 600 ind.; – Mikre, Malkata Mikrenska Peštera cave [31], 25 April 1991: obs 4ma; – Zlatna Panega, Panežka (Izvora) cave [32], 8 Febr. 1965: coll. 7ma (NMP 50098–50100 [S+B], IVB 4–7 [S+B]; cf. Hůrka 1984a). – M o n t a n a: Gorna Luka,

Vodni Peč cave [33], 25 Febr. 2000: obs. 2 ind., 19 July 2000: obs. nurs. colony of ca. 100 ind.; – Mitrovci, Goljamata Mitrovska Peštera cave [34], 18 July 2000: obs. 10 ind. – P a z a r d ž i k: Gabrovica, Golaškata Peštera mine [35], 31 March 1963: coll. 3fa (NMNHS; leg. P. Beron), 26 June 1990: net. 1ma, 2fa, 17 Oct 1993: obs. 2ma, 23 Jan. 1997: obs. 10 ind., 7 June 1998: obs. nurs. colony, 11 Dec. 1998: obs. 1 ind., 27 Jan. 2002: obs. 3 ind.; – Peštera, Ušatovi Dupki cave [36], 8 August 1967: obs. 2ma (coll. 1ma, IVB 14 [S]). – P l e v e n: Devenci, Hajduškata Peštera cave [37], 7 July 1975: net. 1ma, 4fa, 1fj (NMP 49668–49673 [S+A]), 18 Febr. 1998: obs. ca. 400 ind. (cf. Pandurska 2003), 4 Dec. 1999: obs. 6 ind.; – Dolna Mitropolija [38], over Vit river, 6 July 1996: net. 1f (NMNHS 060; leg. P. Dimitrov); – Muselievo, cave No. 419 [39], 30 May 2001: obs. nurs. colony of ca. 600 ind.; – Muselievo, cave No. 420 [40], 20 Oct. 2002: obs. ca. 400 ind. (leg. I. Borissov); – Muselievo, Nanin Kamăk cave [41], 12 August 1994: net. 3ma, 2mj, 4fa, 1fj, obs. nurs. colony, 28 July 1998: obs. nurs. colony of ca. 200ind.; – Pleven, Kajlăka park [42], underground channel, 8 August 1997: obs. 1 ind.; – Rakita, Sedlarkata cave [43], 14 April 1991: obs. 30 ind., 14 May 1998: net. 10fa, obs colony of ca. 100 ind., 4 Dec. 1999: obs. 10 ind., 22 March 1997: obs. 150 ind., 29 Jan. 1998: obs. 17 ind., 18 July 2001: net. 47ma, 10fa; – Sadovec, Gininata Peštera cave [44], 10 Sept. 1968: coll. 1ma, 1fa (NMNHS; leg. P. Beron). – P l o v d i v: Dobrostan, Ahmet'ova Dupka cave [45], 28 Dec. 1999: obs. 6 ind.; – Dobrostan, Ivanova Voda cave [46], 20 Febr. 1997: obs. ca. 9000 ind., 27 July 1998: net. 3ma; – Mostovo, Gargina Dupka cave [47], 4 August 1995: net. 1ma, 7 Febr. 1998: obs. 1 ind., 21 May 1998: obs. 92 ind., 25 July 1998 obs. colony of ca. 500 ind., exam. 60ma, 29 Dec. 1999: obs. 15 ind. – R u s e: Červen, Zorovica cave [48], 23 Sept. 2002: obs. ca. 100 ind.; – Krasen, Găbarnika cave [49], 30 June 1996: obs. nurs. colony of ca. 3000 ind. (cf. Undžijan 1998), 29 Jan. 1998: obs. 500 ind., 28 July 1998: obs. nurs. colony of ca. 6000 ind., 2 Oct. 1999: obs. ca. 1000 ind. (incl. mating), 22 Jan. 2000: obs. 550 ind., 13 June 2000: obs. nurs. colony of ca. 3000 ind.; – Pepelina, Orlova Čuka cave [50], 21 Jan. 2000: obs. 1 ind. – S m o l j a n: Trigrad, Djavolskoto Gărlo cave [51], 23 June 1996: net. 4ma, 1fa, 1fj, 29 June 2000: net. 1ma, 2 Dec. 2000: obs. 5 ind. – S o f i j a: Ginci, Dinevata Pešt cave [52], 22 Sept. 1991: net. 1ma, 2fa (cf. Pandurska et al. 1999), 18 April 1993: net. 1ma, 11 Oct. 1997: obs. ca. 200 ind., 18 Jan. 1998: obs. 2 ind. – V e l i k o T ă r n o v o: Emen, Emenskata Peštera cave [53], 22 Oct. 1989: obs. ca. 50 ind., 23 Nov. 1990: obs. ca. 90 ind., 29 April 1995: obs. ca. 200 ind., 13 April 1996: obs. ca. 50 ind., 21 Febr. 1998: obs. ca.

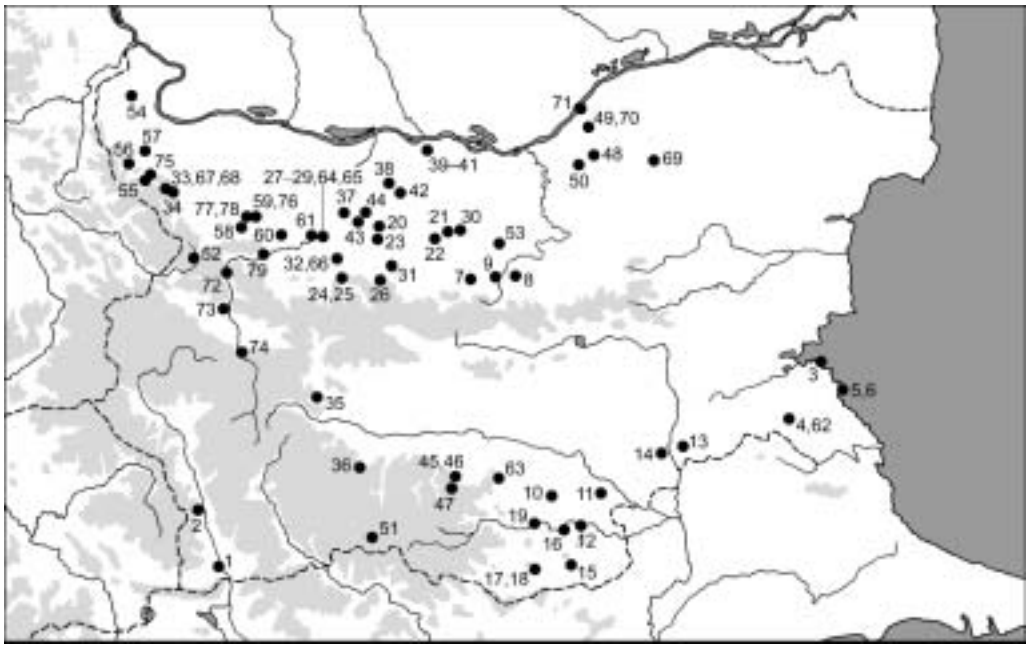

Fig. 15. Records of *Myotis capaccinii* (Bonaparte, 1837) in Bulgaria. Numbers correspond with locality numbers in the text.

150 ind., 15 May 1998: obs. 60 ind., 27 July 1998: obs. nurs. colony of ca. 150 ind., 12 Sept. 1998: obs. 15 ind., 25 May 1999: obs. 8 ind., 19 April 2000: obs. 2 ind., 29 May 2000: obs. 10 ind., 23 Sept. 2000: obs. ca. 50 ind. – V i d i n: Car Petrovo, Vărkan cave [54], 27 July 2000: obs. ca. 200 ind.; – Gorni Lom, Desni Suhi Peč cave [55], 25 Febr. 2000: obs. 30 ind.; – Kračimir, Kračimirsko Vrelo cave [56], 26 Febr. 2000: obs. 1 ind.; – Orešec, Peč cave (Suhi Peč) [57], 24 Febr. 1995: obs. 1fa, 26 Febr. 2000: obs. 20 ind., 20 July 2000: obs. colony of ca. 200 ind. – V r a c a: Beli Izvor, Kalna Mătnica cave (Toškova Dupka) [58], 11 Dec. 1999: obs. 60 ind., 22 July 2000: obs. nurs. colony of ca. 1000 ind.; – Čiren, Ponora cave [59], 22 April 1995: obs. colony of ca. 200 ind., 3 March 1997: obs. 1 ind., 27 Jan. 1998: obs. ca. 90 ind., 27 July 2000: obs. 10 ind.; – Kalen, Kalenskata Peštera cave [60], 8 March 1998: obs. 70 ind.; – Kunino, Čeloveča Dupka (Čeloveči Dol) cave [61], 1 May 1993: obs. 2ma, 1fa, 22 July 1995: obs. ca. 100 ind., 11 Dec. 1999: obs. 1 ind. – **Published data**: B u r g a s: Karamlek [= Karamlăk = Mladežko] [62], Strandjabalkan [= Strandža Mts.], 2 July 1935: 5m, 1f (type series of *Leuconoe capaccinii bureschi* Heinrich, 1936) [2 August 1935: 1 ind. NMNHS] (Heinrich 1936, Feiler 1999). – H a s k o v o: Mečkovec Mts. [= Spahievo, Aida hill, galleries] [63], 14 July 1986: 1 ind. (Hůrka 1997). – L o v e č: Bežanovo, Parnicite cave [20], colony of ca. 1500 ind. (Beron 1964b), 17 Febr. 1963 (Jančev & Stojkova 1973), May 1990 – Sept. 1991: colony of ca. 700 ind. (Pandurska 1998), summer visit: hundreds ind. (Beškov 1993, Beshkov 1998), winter visit: 2000–2500 ind. (Beškov 1993, Beshkov 1998); – Devetaki, Devetaškata Peštera cave [22], May–June 1997: mixed colony (with *M. myotis* and *M. blythii*) (Pandurska 1999, Pandurska & Paunović 1997); – Karlukovo, Svirčovica cave [64], 2 March 1936: 1m [NMNHS 035-1] (Hanák & Josifov 1959); – Karlukovo, Troevratica cave [29], summer 1992: 29 ind. (Popov & Ivanova 1995), spring 1993: 3 ind. (Popov & Ivanova 1995); – Karlukovo, Zadănen Dol near Prohodna cave [65], spring 1992: 1 ind. (Popov & Ivanova 1995); – Zlatna Panega, Dolnata Peštera cave [66], 28 Febr. 1960: "plus nombreuse" (Beron 1961, 1962); – Zlatna Panega, Panežka Izvora cave [32], 8 Febr. 1965: 1m (Sklenář 1969). – M o n t a n a: Gorna Luka, Mišin Kamăk cave [67], 1991–1998 [20 Febr. 1998: obs. ca. 300 ind.] (Pandurska & Beshkov 1998a); – Gorna Luka, Peč cave [68], 1991–1998 (Pandurska & Beshkov 1998a). – P a z a r d ž i k: Gabrovica, Golak, cave [35], 31 March 1964 (Jančev & Stojkova 1973), Golaškata cave, 16–17 June 1991: 300 ind. (Pandurska 1998); – P l e v e n: Devenci, Hajduška Peštera cave [37], May–June 1997: mixed colony (with *M. myotis* and *M. blythii*) (Pandurska & Paunović 1997, Pandurska 2003); – Muselievo, Nanin Kamăk cave [41], 9 August 1971 [coll. 1 ind., NMNHS] (Beron 1972, 1973a, 1974b, cf. Beškov 1993, Beshkov 1998), 1968–1989: 400–1500 ind. (Beškov 1993, Beshkov 1998); – Sadovec, Gininata Peštera cave [44], July 1988: ca. 100 ind. (Beškov 1993, Beshkov 1998), Dec. 1988: ca. 20 ind. (Beškov 1993, Beshkov 1998). – P l o v d i v: Mostovo, Garvanica cave [= Gargina Dupka] [47], 21 August 1959: 1 ind. (Beron 1961, 1964b, Beron & Kolebinova 1964, Nowosad et al. 1987), 21 Sept. 1959: 1 ind. (Nowosad et al. 1987), 6 June 1978: 1 ind. (Nowosad et al. 1987), 16 June 1978: 2 ind. (Nowosad et al. 1987), 6 July 1978: 3 ind. (Nowosad et al. 1987). – R a z g r a d: Krivnja, Božkova Dupka cave [69], March 1989: several ind. (Beškov 1993, Beshkov 1998). – R u s e: Krasen [70], 23 Sept. 1991: net. 1 ind. (Undžijan 1998); – Ruse, gallery near the Lom river estuary [71], 28 Nov. 1962: 1 ind. (Undžijan 1998). – S o f i j a: Cerovo, Vodnata Peštera cave [72], May–June 1997: mixed colony (with *M. myotis* and *M. blythii*) (Pandurska & Beshkov 1998a, Pandurska & Paunović 1997); – Ginci, Dinevata Pešt cave [52], nettings 1990–1994: 6 ind. (Pandurska et al. 1999), 1991–1998 (Pandurska & Beshkov 1998a); – Kătina [73], gallery, 28 Oct. 1957 (Beron 1958), 11 Dec. 1957 (Beron 1958), 12 Jan. 1958 (Beron 1958); – Kokaljane, Urvič [74], gallery, 9 May 1965 (Jančev & Stojkova 1973). – V e l i k o T ă r n o v o: Emen, Emenskata Peštera cave [53], nurs. colony (Pandurska 1993), May–June 1997: mixed colony (with *M. myotis* and *M. blythii*) (Pandurska & Paunović 1997). – V i d i n: Dolni Lom, Desni Suhi Peč cave [75], 1991–1998 (Pandurska & Beshkov 1998a); – Orešec, Suhi Peč cave [57], 25 Dec. 1969 (Beron 1973a), 27 Dec. 1969 (Beron 1972), Dec. 1988: 15–20 ind. (Beškov 1993, Beshkov 1998), 1991–1998 (Pandurska & Beshkov 1998a). – V r a c a: Čiren, Malkata Peštera cave [76], 26 Oct. 1960: 4 ind. (Beron 1961, 1962); – Čiren, Ponora cave [59], 26 Oct. 1960: "quelques dizaines" (Beron 1961, 1962), 1958–1966: large colony (Beškov 1993, Beshkov 1998); – Liljače, Božija Most cave [77], 11 July 1986: obs. nurs. colony of ca. 400–600 ind. (Grimmberger 1993), Prilepnata Peštera cave, 7 July 1960 (Beron 1961, 1962); – Liljače, Tigančeto cave [78], 16 August 1963 (Beron & Guéorguiev 1967); – Ljutibrod, Gara Čerepiš, Serapionovata cave [79], 1991–1998 (Pandurska & Beshkov 1998a, Pandurska 2003).

DISTRIBUTIONAL STATUS (Fig. 15). Heinrich (1936) was the first who published a record of *M. capaccinii* in Bulgaria, further records were published in 1950s and 1960s (Hanák & Josifov 1959, Beron 1958, 1961, 1962, 1964, Beron & Gueorguiev 1967, etc.) and, in particular, during the last decades. The species has been recorded on the whole Bulgarian territory in a total of 79 localities (Tab. 11). In the eastern Balkans, the northern border of its distribution seems to be represented by the Danube from western Bulgaria to southern Dobrogea in Romania (Raduleț 1994a), in the western Balkans, the distribution reaches further northward up to the Carpathian Basin (Raduleț 1994a,

Valenciuc 1994, Spitzenberger & Helversen 2001). The core regions of distribution of *M. capaccinii* in Bulgaria are in the northern foothils of the Balkan Mts., in the Predbalkan area, and in the Eastern Rhodopes Mts. where numerous large colonies were found in caves. At the same time, in many other regions of Bulgaria, such as the mountain areas of south-western Bulgarian or in Dobrogea, *M. capaccinii* is quite a rare species. Such a type of distributional discontinuity is characteristic of this species also in the neighbouring southern countries, i. e., the Turkish and Greek Thrace (Hanák et al. 2001, Karataş et al. 2003). The reasons for this may lie in combination of three well pronounced specificities of this species: (1) foraging strategy demanding reservoirs of eutrophic stagnant water, (2) strict cave-dwelling with preference of spacious caves suitable for continous whole year occupancy, and (3) extremely high sociality of *M. capaccinii* that is well pronounced not only in particularly large size of its breeding colonies (up to 6000 individuals in Bulgaria) but also in the fact that vast majority of its record from both winter and transient autumn or spring periods are just the large colonies (up to 9000 individuals) while records of individual bats are rather exceptional. All this produce a set of demands to which only few regions may respond – namely the extensive karst areas integrated into warm and humid surrounding habitats. And, apparently, only few regions of the Mediterranean provides a combination of these qualities completely.

All the above mentioned specificities of the species are well examplified by the Bulgarian records of *M. capaccinii*. Most of them come from lower altitudes, 0–700 m a. s. l., except for four, viz., Gargina Dupka cave near Mostovo (ca. 1000 m a. s. l.), Dinevata cave near Ginci (1150 m a. s. l.), Ivanova Voda cave near Dobrostan (1350 m a. s. l.), and Djavolskoto Gărlo cave near Trigrad (ca. 1500 m a. s. l.), which at the same time are the maximum altitudinal records for the species in Europe according to Spitzenberger & Helversen (2001) who report highest elevation at ca. 900 m a. s. l. *M. capaccinii* is strictly cavernicolous element forming large nursery colonies (up to several thousands of individuals) in spacious caves situated in river valleys of karstic regions. It often forms mixed colonies with *Miniopterus schreibersii*, *Myotis myotis* and *M. blythii*. Records in man-made underground shelters are rare. *M. capaccinii* is one of two bat species which have been incuded into the Red Data Book of Bulgaria (Pešev 1985b). The present data suggests that it is relatively abundant species which is not directly endangered. External and cranial dimensions of examined specimens of *M. capaccinii* from Bulgaria are shown in Tab. 5.

NOTE. Heinrich (1936) described from Bulgaria a separate form, *Leuconoe capaccinii bureschi* (terra typica: Dorf Karamlek, Strandjabalkan, 250 m [= Mladežko, Strandža Mts.]). The name was applied as a valid for the east-Mediterranean subspecies (see DeBlase 1980, Koopman 1994, or Guillén in Mitchell-Jones et al. 1999), recent authors, however, mostly consider *M. capaccinii* to be monotypic and taxonomically homogenous in the north-western Mediterranean (for details see Benda & Horáček 1998, Horáček et al. 2000, Hanák et al. 2001, Spitzenberger & Helversen 2001, Albayrak & Aşan 2002, etc.).

Vespertilio murinus Linnaeus, 1758

RECORDS. **Original data**: B l a g o e v g r a d: Bansko, Bănderica hut [1], Nišata cave, 21 Febr. 1992: obs. 1ma; – Kresna, Šejtan Dere valley [2], May 2000: 1m (cf. Petrov 2001); – Liljanovo, Popina Lăka [3], wooden building, 10 July 1976: obs. colony of ca. 80 ind., net. 60ma (NMP 49373–49376, 49378–49381, 49383–49429 [S+A], 49377, 49382 [S], 50219–50221 [A]; cf. Hůrka 1984b). – L o v e č: Aprilci, Pleven hut [4], 14 August 1997: obs. colony of ca. 15 ind., net. 2ma (cf. Ivanova 1998, Beron et al. 2000a); – Ribarica, Vežen hut [5], wooden building, 13 July 2001: coll. 1ma (NMNHS 172; leg. D. Vasilev). – S i l i s t r a: Nova Černa [6], building, 15 Oct. 1996: obs. 1ma; – Pop Kralevo [7], 1993: coll. 1ma (NMNHS 049; leg. M. Marinov). – S m o l j a n: Arda [8], village, 1 Nov. 2003: obs. and det. display behaviour of ca. 10 ind. around lamps; – Jagodina, on the road

Jagodina–Bujnovo [9], 27 Sept. 2003: found 1m (NMNHS); – Orehovo, cave 100 m W of the village [10], 29 June 1984: net. 1ma (NMP 50042 [S+A]; leg. T. Scholz & D. Král); – Pamporovo, Hotel Murgavec [11], 25–26 Sept. 2003: obs. and det. display behaviour of ca. 20 ind. around the building. – S o f i j a: Borovec [12], building, 24 Nov. 2003: obs. 1f; – Ginci, Dinevata Pešt cave [13], 22 Sept. 1991: net. 1ma (cf. Pandurska et al. 1999); – Lozen [14], building, 22 Nov. 2003: obs. 1m; – Sofija [15], building in the town, 13 Dec. 1991: obs. 1ma, 16 Dec. 2002: obs. 1m, 25 Oct. 2003: coll. 1m (NMNHS); Sofija, Institute of Botany building, Oct. 1998: coll. 1ma (NMNHS 156). – S t a r a Z a g o r a: Tăža, Džendema reserve [16], small cave, 29 August 1997: net. 1 ind. (leg. V. Beškov & R. Pandurska, cf. Ivanova 1998, Beron et al. 2000a). – **Published data**: B l a g o e v g r a d: Bansko [17], 25 Nov. 1914: 1ma, 1ms (Bureš 1917, Kovačev 1925). – L o v e č: Karlukovo, Zadănen Dol near Prohodna cave [18], summer 1991: 2 ind. (Popov & Ivanova 1995), summer 1992: 1 ind. (Popov & Ivanova 1995). – R u s e: Božičen [19], 1991: 1 ind. (from owl pellets) (Mitev 1995); – Pisanec [20], 1 ind. (from owl pellets) (Mitev 1995); – Ruse [21], town, 4 July 1968: 1 ind. (Undžijan 1998). – S o f i j a: Bojana, Zlatni Mostove [22], lake, 1400 m, 22 August 1994: net. 1m (Pandurska & Beshkov 1998b); – Borovec [12], 1350 m (Markov 1955a), 1400 m, 1 August 1955 [NMNHS] (Hanák & Josifov 1959), building, 21 Dec. 1995: obs. 1ma (Beron et al. 2000b); – Ginci, Dinevata Pešt cave [13], nettings 1990–1994: 2 ind. (Pandurska et al. 1999), 2 Sept. 1994 (Beron 1994), 1991–1998 (Pandurska & Beshkov 1998a); – Lakatnik [Temnata Dupka cave] [23], 16 Sept. 1932 [NMNHS 046-1] (Hanák & Josifov 1959); – Sofija [15], 25 Oct. 1922 [NMNHS] (Hanák & Josifov 1959).

DISTRIBUTIONAL STATUS (Fig. 16). Although the occurrence of *V. murinus* in the Balkans was considered long time unprobable (cf. Hanák et al. 2001), from Bulgaria was a records of this species from the Pirin Mts. published (Bureš 1917, Kovačev 1925), and further data were obtained in period between World Wars and later (Markov 1955a, Hanák & Josifov 1959). The total of 23 localities where the species was found in Bulgaria (Tab. 11) concern mostly mountainous regions in central

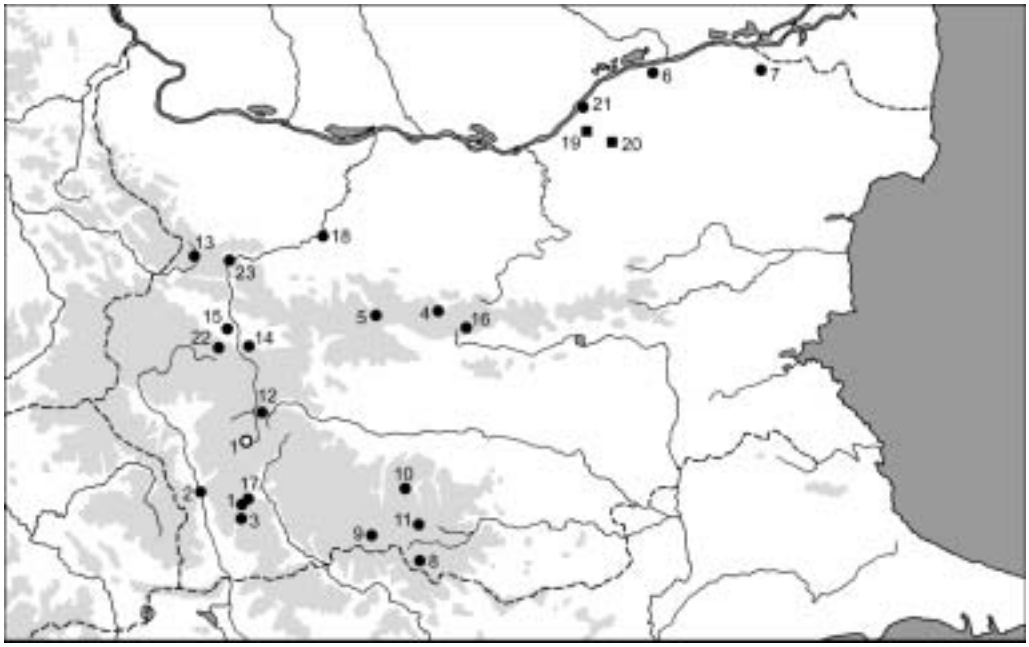

Fig. 16. Records of *Vespertilio murinus* Linnaeus, 1758 (closed symbols) and *Eptesicus nilssonii* (Keyserling et Blasius, 1839) (open symbol) in Bulgaria. Explanation of symbols as in Fig. 3. Numbers correspond with locality numbers in the text.

and south-western Bulgaria (Balkan Mts., Rila Mts., Pirin Mts., Western Rhodopes Mts.) up to the elevation of 2000 m. A minor part of the records (22%) concern lowlands in the north-east of the country (Ludogorie Plateau). Thus, *V. murinus* is distributed over much of the Bulgarian territory (contra Baagøe 2001a). According to the present evidence, Western Rhodopes Mts., Central Balkan Mts., and Bulgarian Dobrogea (Dobrudža) represent a part of the southern border of its distribution in Europe. The species is missing in most of SE Bulgaria as well as in the Turkish Thrace and the eastern part of Greek Thrace, but it was recorded in Asia Minor and in northern Greece (Benda & Horáček 1998, Hanák et al. 2001). The latter records represent the southernmost margin of European distribution range of the species (Hanák et al. 2001, Baagøe 2001a).

In agreement with postulates by Strelkov (1997, 1999, 2000), Strelkov & Abramov (2001) and Baagøe (2001a), *V. murinus* does not form nursery colonies in Bulgaria and in other Balkan countries within its distribution range; only males and not reproducing females live there, either temporarily or permanently. The data we summed up correspond to that idea. Most Bulgarian records concerned solitary males found either in late summer (migrating?) or in winter (hibernating). Such cases may have represented transient sojourns of individuals of northern origin. Anyhow, two large male summer colonies of *V. murinus* were discovered both roost behind wooden panels of mountain huts (Pirin Mts., 10 July, 1400 m a. s. l.; Balkan Mts., 14 August, 1500 m a. s. l.). Only one female *V. murinus* was recorded in Bulgaria (Rila Mts., 24 November). To conclude, permanent male population may live in woody Bulgarian mountains and in the neighbouring Greek Rhodopes Mts. (see Weid 1988). In late summer and in autumn, the region is invaded by immigrants of both sexes from northern Europe which supposedly hibernate there (cf. Strelkov 1997, 1999, 2000). External and cranial dimensions of examined specimens of *V. murinus* from Bulgaria are shown in Tab. 7.

Eptesicus serotinus (Schreber, 1774)

Records. **Original data**: B l a g o e v g r a d: Goce Delčev [1], streets, 15 July 1982: obs. hunting individuals; – Kresna, Šejtan Dere [2], 2 July 1995: net. 1ma (NMNHS; cf. Petrov 2001); – Ploski, cave [3], 18 July 1981: net. 2ma (NMP 50154, 50155 [S+B]), 3 July 1986 net. 2ma, 31 July 1994: net. 1ma (NMP 50396 [A]); – Ribnovo, Manuilovata Peštera cave [4], 22 June 2000: net. 1 ma. – B u r g a s: Černomorec, Nos Atija cape [5], abri, 12 July 1987: net. 3ma; – Černomorec [6], town, 14 July 1987: net. 1ma; – Mladežko, Lejarnicite cave [7], 25 August 1999: net. 1ma. – D o b r i č: Kavarna, cave near sea [8], 11 Sept. 1962: coll. 1ma (IVB 9 [S+B]; cf. Gaisler & Hanák 1964, Gaisler 1970b); – Tjulenovo [9], cave, 17 August 1983: net. 1fs. – G a b r o v o: Jantra, Prilepnata Peštera cave [10], 27 July 1998: coll. 1 subfossil ind. (NMNHS). – H a s k o v o: Careva Poljana [11], 7 Oct. 2003: obs. and det. several ind. (leg. R. Lučan). – J a m b o l: Ustrem, Bozkite cave [12], 10 April 1998: net. 1ma. – K ă r d ž a l i: Orešari, Karangin cave [13], 20 July 1998: net. 1ma; – Tatul [14], small volcanic cave, 3 May 1996: obs. 1ma (cf. Ivanova 1997). – L o v e č: Devetaki, Devetaškata Peštera cave [15], 20 May 1999: net. 1ma (leg. C. Dietz); – Karlukovo, cave behind monastery [16], 8 August 1978: net. 7ma, 1fa (NMP 50295–50302 [S+A]), 9 August 1978: net. 1ma, 2ms (NMP 50306–50308 [S+A]); – Karlukovo, cave in the monastery [17], 9 August 1978: net. 1ma, 1fa (NMP 50304, 50305 [S+A]); – Karlukovo, small cave near Prohodna [18], 9 August 1978: net. 3ma, 1ms, 1fa (NMP 50309–50313 [S+A]); – Karlukovo, ridge of a rocky amphitheatre [19], 5 July 1976: net. 2ma (NMP 50210, 50212 [S+A]; cf. Kučera 1979), 6 July 1976: net. 3ma (NMP 50214, 50215, 50218 [S+A]), 12 June 1977: net. 1ma (NMP 50224 [S+A]), 15 June 1977: net. 5ma (NMP 50226–50230 [S+A]); – Karlukovo, Prohodna cave [20], 7 August 1978: net. 1fs (NMP 50290 [S+A]); – Karlukovo, Temnata Dupka cave [21], 7 August 1978: net. 1ma, 1ms (NMP 50291, 50292 [S+A]). – P a z a r d ž i k: Batak, Cigov Čark [22], among fishermen cottages, 10 July 1981: net. 1ma (NMP 50153 [S+B]); – Peštera, Ušatovi Dupki cave [23], 4 Febr. 1965: coll. 1ma (IVB 24 [S+B]; cf. Hůrka 1965, Gaisler 1970b); – Velingrad, a cave ca. 400 m above the Lepenica cave [24], 9 July 1981: net. 1ma (NMP 50152 [S+B]). – P l e v e n: Muselievo, niche near the cave Nanin Kamăk [25], 12 August 1994: net. 2ma (NMNHS 144, 145); – Rakita, niche near the cave Sedlarkata [26], 14 May 1998: net. 1 ind.; – Reselec [27], 18 August 1984: coll. 1ma (NMP 50373 [A]). – P l o v d i v: Plovdiv, town [28], 14 July 1975: coll. 1ma dead on a boulevard; obs. in streets, 17 August 1978: obs. ca. 5–10 flying ind. – R u s e: Nisovo, near the village and over a river [29], 2 Oct. 1999: det. several ind.; – Pepelina [30], rocky cliff near the village, 4 Oct. 1999: det. several ind.; – Pisanec, Goljama Peštera cave [31],

Tab. 7. Basic biometric data for examined Bulgarian samples of *Vespertilio murinus* Linnaeus, 1758, *Eptesicus serotinus* (Schreber, 1774), and *Hypsugo savii* (Bonaparte, 1837). For abbreviations see p. 250

	Vespertilio murinus					*Eptesicus serotinus*					*Hypsugo savii*				
	n	min	max	M	SD	n	min	max	M	SD	n	min	max	M	SD
LC	62	58.0	67.0	62.3	2.138	44	63.0	82.0	73.9	3.513	38	43.0	54.0	49.1	2.798
LCd	62	40.0	49.0	43.7	2.235	44	45.0	61.0	54.8	3.356	36	29.0	44.0	38.6	3.165
LAt	62	40.0	46.3	43.8	1.302	45	47.0	55.2	51.4	1.742	39	31.2	37.0	33.6	1.060
LA	62	14.5	18.0	16.2	1.034	44	17.0	21.0	18.9	0.809	36	10.6	18.0	12.8	1.482
LTr	62	4.4	8.0	6.8	0.672	44	7.0	10.0	8.8	0.664	32	4.0	7.5	5.8	0.908
G	27	10.0	14.0	11.7	1.058	41	17.0	34.0	22.7	4.035	29	5.0	10.0	6.8	1.246
LCr	58	13.97	15.76	14.80	0.334	44	19.07	21.40	20.42	0.547	45	12.82	14.03	13.39	0.275
LCb	58	14.08	15.53	14.74	0.345	44	18.48	20.62	19.57	0.549	45	12.45	13.55	12.98	0.287
LaZ	58	9.20	10.39	9.75	0.242	43	12.74	14.53	13.78	0.411	42	8.30	9.20	8.70	0.216
LaI	58	3.78	4.56	4.08	0.162	45	3.93	4.64	4.28	0.167	47	3.11	3.82	3.53	0.136
LaN	58	7.28	8.15	7.69	0.174	44	8.93	9.97	9.37	0.260	46	6.30	7.97	6.78	0.261
AN	58	4.53	5.51	5.04	0.161	43	5.93	6.83	6.47	0.207	45	4.19	4.85	4.59	0.151
CC	57	4.82	5.48	5.10	0.162	45	6.12	6.84	6.52	0.182	47	3.80	5.33	4.23	0.233
M^3M^3	58	4.90	6.59	6.27	0.267	45	8.16	8.88	8.47	0.191	47	5.38	6.07	5.77	0.172
CM^3	58	4.98	5.60	5.29	0.143	45	7.35	8.24	7.70	0.194	47	4.32	4.80	4.53	0.112
LMd	58	10.12	11.32	10.86	0.232	45	14.22	15.78	15.08	0.406	47	9.03	9.96	9.42	0.213
ACo	58	3.07	3.73	3.38	0.152	44	4.62	6.25	5.54	0.284	16	2.52	3.08	2.78	0.130
CM_3	57	5.32	5.88	5.59	0.135	45	7.71	8.93	8.48	0.236	47	4.57	5.07	4.85	0.118

3 Oct. 1999: det. several ind.; – Pisanec, over a large fishpond [32], 3 Oct. 1999: det. several ind. – S i l i s t r a: Onogur, Ergele Peštera cave [33], 20 April 2001: net. 1fa; – Vojnovo, Malkata Badžalija cave [34], 16 April 1999: net. 6ma, 5 Oct. 1999: net. 1fa, 19 April 2001: net. 5ma (coll. 1m, NMNHS 146). – S l i v e n: Sliven [35], 13 June 1982: coll. 1ma (NMP 40921 [S+B]). – S m o l j a n: Borino, Eminovata cave [36], 6 Nov. 1993: coll. 1 subfossil ind. (NMNHS); – Gela, Ledenica cave [37], 31 July 1971: net. 1ma (NMP 50414 [S]; cf. Horáček et al. 1971, 1974); – Jagodina, Dolna Karanska Dupka cave [38], 16 August 1978: net. 1ma (NMP 50320 [S+A]); – Jagodina, Imamova (= Jagodinskata) cave [39], 2 August 1971: net. 2ma (coll. 1 ind., NMP 47/72/C29 [S+B]; cf. Horáček et al. 1971, 1974); – Jagodina, Sančova Dupka cave [40], 3 August 1971: net. 1ms (NMP 49350 [S+B]; cf. Horáček et al. 1971, 1974); – Mogilica, Uhlovica cave [41], 20 July 1996: net. 1ma; – Orehovo, cave 100 m W of the village [42], 28 June 1984: net. 1ma (leg. T. Scholz & D. Král), 29 June 1984: net. 2ma (leg. T. Scholz & D. Král). – S o f i j a: Ginci, Dinevata Pešt cave [43], 22 Sept. 1991: net. 1ma (cf. Pandurska et al. 1999); – Lipnica, Kozarnika cave [44], 30 July 1995: coll. 1mj (NMNHS 045; cf. Pandurska & Beshkov 1998a), 21 May 1997: net. 3 ind. (leg. R. Pandurska); – Sofija [45], building, 31 May 1991: obs. 1 ind. (leg. Z. Boev), building of the National Library, 20 July 1995: obs. nurs. colony of ca. 70 ind., net. 6fa, 1fj, 13 July 1998: obs. nurs. colony of ca. 60 ind.; – Zasele, near the waterfall Skaklja [46], 13 Jan. 2002: coll. 1fa (NMNHS 154). – V a r n a: Komunari [47], rocky labyrinth NE of the town, 12 July 1979: net. 1ma, 1mj, 1fj (coll. 1ma, NMP 50324 [S+A]). – V e l i k o T ă r n o v o: Emen, Emenskata Peštera cave [48], over the Negovanka river, 15 May 1998: net. 1fa. – **Published data**: B l a g o e v g r a d: Leško [49], cave, 8 June 1996: net. 1 ind. (Pandurska & Beshkov 1998b); – Ploski, rocky crevice [50], 6 June 1990: obs. large colony (Pandurska 1992, Pandurska & Beshkov 1998b); – Simitli, the Struma river valley south of the town [51], 30 April 1985: 1 ind. (from owl pellets) (Obuch & Benda 1996). – B u r g a s: Burgaskite Ezera lakes [52], Sept.–Oct. 2002 (Pandurski 2003); – Strandjabalkan [= Strandža Mts.] [53], 1935: 1 ind. (Heinrich 1936). – D o b r i č: Dobrudža [*54*], undefined (Markov & Hristov 1960). – K j u s t e n d i l: Rila-Gebirge, beim Rila-Kloster [= Rilski Manastir] [55], 30 May 1938: 1ma [ZFMK 39.24 (S+B), leg. A. v. Jordans] (Wolf 1940). – L o v e č: Gložene, Morovica cave [56], net. (Beškov 1993, Beshkov 1998); – Karlukovo, Zadănen Dol near Prohodna cave [57], summer 1988: 3 ind. (Popov & Ivanova 1995), summer 1989: 5 ind. (Popov & Ivanova 1995), summer 1990: 1 ind. (Popov & Ivanova 1995), summer 1991: 16 ind. (Popov & Ivanova 1995), autumn 1991: 2 ind. (Popov & Ivanova 1995), spring 1992: 1 ind. (Popov & Ivanova 1995), summer 1992: 16 ind. (Popov & Ivanova 1995). – M o n t a n a: Gorna Bela Rečka [58], gallery, 1991–1998 (Pandurska & Beshkov 1998a). – P a z a r d ž i k: Veličkovo [59], building, 12 July 1961: 1faL (Beškov & Beron 1962). – P l e v e n: Sadovec, Gininata Peštera cave [60], Dec. 1988: 2 ind. (Beškov 1993, Beshkov 1998). – P l o v d i v: Plovdiv, lowland in the vicinity of town [61], 1935: 5 ind. (Heinrich 1936); – Sadovo [62], 24 April 1915: 1f (Bureš 1917, Kovačev 1925). – R u s e: Červen [63],

cave, 1966: mummy (Undžijan 1998); – Košov [64], 10 Oct. 1958: 1 ind. (Beškov & Beron 1962); – Nisovo [65], 2 ind. (from owl pellets) (Mitev 1995); – Pisanec, Lom river valley [66], 1935 (Heinrich 1936), Pisanec, 10 ind. (from owl pellets) (Mitev 1995); – Ruse [67], town, 10 May 1963 (Undžijan 1998). – S m o l j a n: Lăki, rocks in the valley bellow the town [68], 27 April 1985: 1 ind. (from owl pellets) (Obuch & Benda 1996). – S o f i j a: Borovec [69], 1350 m, 10 August 1954 (Markov 1955a); – Breze, Travninata cave [70], 1991–1998 (Pandurska & Beshkov 1998a); – Ginci, Dinevata Pešt cave [43], nettings 1990–1994: 3 ind. (Pandurska et al. 1999), 1991–1998 (Pandurska & Beshkov 1998a); – Ginci, four caves [71], winter census 1991–1994: 2 ind. (Pandurska et al. 1999); – Iskrec, Dušnika cave [72], 1991–1998 (Pandurska & Beshkov 1998a); – Lakatnik, Răžiška Dupka cave [73], 2 Nov. 1971 (Beron 1972); – Lipnica, Kozarnika cave [44], 1991–1998 (Pandurska & Beshkov 1998a); – Kokaljane, Urvič [74], galleries, 30 May 1958: 10 ind. (Beron 1958); – Komštica, Goljama Balabanova cave [75], 1991–1998 (Pandurska & Beshkov 1998a). – Š u m e n: Kolarovgrad [= Šumen] [76], 20 Oct. 1937: 2f [NMNHS] (Beškov & Beron 1962). – V a r n a: Kamčija river [77], 5 June 1935 (Heinrich 1936, Hopkins & Rotschild 1956). – V e l i k o T ă r n o v o: Emen, Emenskata Peštera cave [48], hibernation of ca. 10 ind. (Pandurska 1993). – V i d i n: Dolni Lom, Levi Suhi Peč cave [78], 2 Febr. 1961: 1f (Beron 1962, Beškov & Beron 1962). – V r a c a: Elisejna, Četvărtitata cave [79], 1991–1998 (Pandurska & Beshkov 1998a).

DISTRIBUTIONAL STATUS (Fig. 17). *E. serotinus* was recorded in 79 localities (Tab. 11), the records represent both individuals and nursery colonies. Accordingly, *E. serotinus* is a common bat in most of Bulgaria from the sea level up to medium-high mountains, it was never found in high mountains (highest record is from 1540 m a. s. l.). The records concern mist netted individuals over water and at entrances to galleries and caves, individuals and colonies found in buildings including the blocks of prefabricated houses in towns and cities (Sofia, Plovdiv, Ruse), individuals roosting in rock crevices or hibernating in underground spaces, and records from owl pellets. Thus, the biology of *E. serotinus* in Bulgaria does not seem to differ from that in more northerly

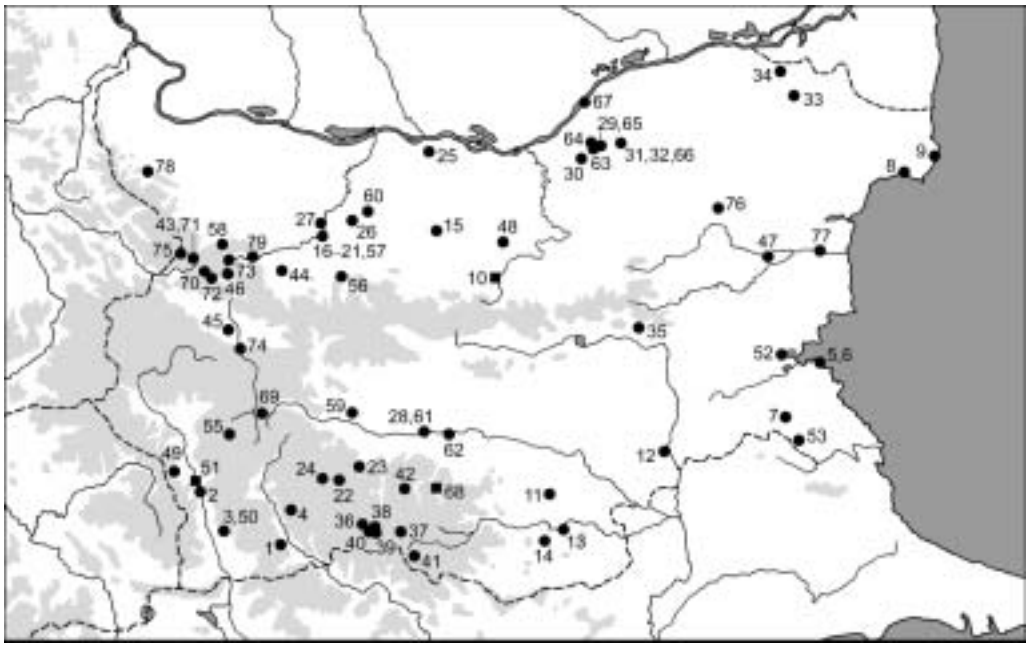

Fig. 17. Records of *Eptesicus serotinus* (Schreber, 1774) in Bulgaria. Explanation of symbols as in Fig. 3. Numbers correspond with locality numbers in the text.

living European populations including the preference of lower elevations up to 1000 m a. s. l. and the trend to synanthropic way of life (Baagøe 2001b). The differences in regional concentration of records reflect different intensity of research rather than different abundance of the species throughout the Bulgarian territory. External and cranial dimensions of examined specimens of *E. serotinus* from Bulgaria are shown in Tab. 7.

Eptesicus nilssonii (Keyserling et Blasius, 1839)

RECORD. **Original datum**: K j u s t e n d i l: Rilski Manastir, Ribni Ezera hut [1], a monitor path, 15 July 1980: found a cadaver of 1fa (NMP 90150 [S]; leg. F. Sedláček, cf. Hanák & Horáček 1986).

DISTRIBUTIONAL STATUS (Fig. 16). There is only one rocord of a dead individual of *E. nilssonii* found in summer in the Rila Mts. in south-western Bulgaria (ca. 2200 m a. s. l.; cf. Hanák & Horáček 1986). This is southernmost record of the species in Europe and one of the southernmost records within its whole distribution area (Hanák & Horáček 1986). Relatively closely situated are the records in the Romanian Southern Carpathians (one finding from Piatra Arsa near Predeal; Rauschert 1963), in the Carpathians foothills in Romanian Banat (two records from Oravița and Caraşova; Gheorghiu et al. 2001, Topál 1959), and in Croatia (Split, Lanza 1957; Velebit Mts., Pavlinić & Tvrtković 2003). Romanian localities lie 320–400 km northwards, Croatian localities lie ca. 600 km towards WNW from the Bulgarian locality. Although isolated and distant from conspecifics, the individual was definitely an *E. nilssonii* as shown by its skull (Fig. 18) and dimensions (Tab. 8), see also Hanák & Horáček (1986).

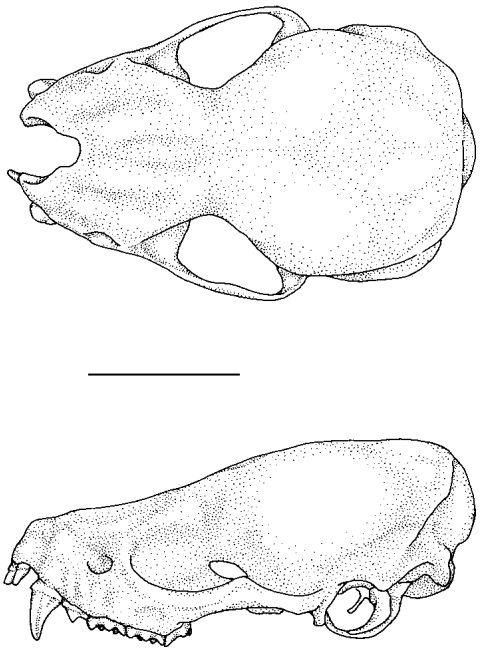

Fig. 18. Skull of *Eptesicus nilssonii* (Keyserling et Blasius, 1839) (NMP 90150) found in the Rila Mts. (see List of species). Scale bar 5 mm.

Tab. 8. Basic biometric data of examined Bulgarian specimens of *Eptesicus nilssonii* (Keyserling et Blasius, 1839), *Nyctalus leisleri* (Kuhl, 1817), *N. lasiopterus* (Schreber, 1780), and *Barbastella barbastellus* (Schreber, 1774). For abbreviations see p. 250

	Eptesicus nilssonii NMP 90150	*Nyctalus leisleri* NMP 50034	*Nyctalus lasiopterus* ZFMK 32.22	*Barbastella barbastellus* IVB 39
LC	–	66.0	–	55.0
LCd	–	43.0	–	47.0
LAt	39.4	42.2	–	38.0
LA	–	15.4	–	15.0
LTr	–	4.3	–	8.0
G	–	18.0	–	8.5
LCr	14.78	15.81	–	14.15
LCb	14.15	15.74	–	13.34
LaZ	9.51	10.45	–	7.62
LaI	4.02	5.62	5.65	3.55
LaN	7.94	8.48	11.13	7.41
AN	4.73	5.52	–	5.39
CC	4.63	5.75	9.27	–
M^3M^3	6.08	6.93	11.02	5.17
CM^3	5.28	5.87	9.09	4.45
LMd	10.78	11.62	17.88	9.20
ACo	3.42	3.08	5.30	2.47
CM_3	4.84	6.21	9.78	5.04

The present data suggest that in the Balkans (Bulgaria, southern Romania, Croatia), the range of *E. nilssonii* is restricted into few islets of boreal forest habitats, and that such a distributional pattern resulted probably of a postglacial fragmentation of the former range, supposedly continous in the Balkans at least during the Late Pleistocene (Hanák & Horáček 1986) as suggested by numerous Late Pleistocene remains of the species in northern Bulgaria (Horáček 1982, Popov 2000).

Hypsugo savii (Bonaparte, 1837)

Records. **Original data**: B l a g o e v g r a d: Bansko, Čalin Valog [1], rocky niche, 1160 m a. s. l., 9 August 2002: net. 1fa; – General Todorov, Pčelina hill [2], gallery, 4 August 1994: net. 2ma, 2fa, 1fs (NMP 50399–50403 [A]), 11 August 1994: net. 2fa, 1fs (NMP 50405–50407 [A]), 23 July 1995: net. 1m, 1f (leg. J. Sádlová), 24 July 1995: net. 1m, 2f (leg. J. Sádlová); – Gorna Breznica, over a brook [3], 15 July 1982: net. 1fa; – Gorna Breznica, village theatre [4], 15 July 1981: obs. 1faL, 16 July 1981: obs. 1 ind. (mummy), net. 6ma (coll. 3m, NMP 50156 [S+B], 50157 [B], 50430 [S]), 20 July 1981: net. 1m; – Gorna Breznica, water spring N of village [5], 22 July 1981: net. 1ma; – Kresna, Gara Pejo Javorov [6], building, 14 July 1990: obs. 1 ind. (cf. Petrov 2001); – Kresna, Gara Stara Kresna [7], tunnel under railway, 19 Dec. 2002: obs. 1 ind.; – Kresna, Šejtan Dere valley [8], 2 July 1995: net. 1ma, 1fa (NMNHS; cf. Petrov 2001), 15 Sept. 1995: coll. 1ma (NMNHS 059; leg. R. Pandurska); – Pastra [9], Elešnica, over a river, 22 July 1993: net. 1ma (NMNHS 047); – Ploski [10], cave, 18 July 1981: net. 1ma, 3 July 1986: net. 1ma; – Rožen [11], rocky ridge, 18 Sept. 1988: det. 1–2 hunting ind. – B u r g a s: Černomorec [12], gallery n. town, 16 July 1987: net. 2fa; – Mladežko, Lejarnicite cave [13], 25 August 1999: net. 6ma, 1fa. – H a s k o v o: Madžarovo [14], gallery, 11 May 1996: net. 1fa, 13 April 1998: net. 1ma. – K ă r d ž a l i: Orešari, Karangin cave [15], 17 Sept. 1996: net. 1ma (cf. Ivanova 1997); – Ribino, Kondžalar cave [16], 23 Sept. 1996: net. 1ma (cf. Ivanova 1997); – Visoka Poljana, Gjumbjurdek-ini cave [17], 22 July 1998: net. 1 ind. – K j u s t e n d i l: Kjustendil [18], building, 10 Oct. 2001: coll. 1ma (NMNHS 176; leg. O. Vitov). – L o v e č: Devetaki, Devetaškata Peštera cave [19], 20 May 1999: net. 1ma (leg. C. Dietz); – Karlukovo, cave behind monastery [20], 8 August 1978: net. 1m; – Karlukovo, cave in the monastery [21], 9 August 1978: net. 1m (NMP 50426 [S]); – Karlukovo, ridge above rocky amphitheatre [22], 12 June 1977: net. 1f, 15 June 1977: net. 2fa; – Karlukovo, ridge of a rocky amphitheatre [23], 8 August 1978: net. 1fa (NMP 50425 [S]; cf. Zima 1982); – Karlukovo, Čerdženica cave [24], 6 July 1975: net. 1ms (NMP 49667 [S]; cf.

Kučera 1979); – Karlukovo, Troevratica cave [25], 21 May 2000: net. 1ma; – Karlukovo, Prohodna cave [26], 13 June 1977: net. 1m; – Karlukovo, small cave near Prohodna [27], 9 August 1978: net. 7 ind.; – Karlukovo, Temnata Dupka cave [28], 7 August 1978: net. 1m; – Karlukovo, Zadănenka cave [29], 9 Nov. 1998: obs. 1 ind. (leg. N. Simov), 20 May 2000: net. 3ma; – Mikre, Goljamata Mikrenska Peštera cave [30], small river, 15 July 2000: net. 1faL. – P l e v e n: Muselievo [31], niche in the rocks, 9 June 2001: net. 1ma; – Rakita [32], a niche near cave Sedlarkata, 14 May 1998: net. 3 ind. – P l o v d i v: Kalofer, Raj hut, Han Maara cave [33], 17 August 1997: net. 1ma (cf. Ivanova 1998, Beron et al. 2000a); – Kalofer, Raj hut, Rogačevata cave [34], 18 August 1997: net. 2ma, 2fa (cf. Ivanova 1998, Beron et al. 2000a); – Kărnare, Mazata cave [35], 25 Sept. 1997: net. 1ma (cf. Ivanova 1998, Beron et al. 2000a). – R u s e: Nisovo [36], near the village, 2 Oct. 1999: det. several ind. – S i l i s t r a: Vojnovo, Malkata Badžalija cave [37], 16 April 1999: net. 3ma, 2fa, 5 Oct. 1999: net. 1ma, 1 ind., 19 April 2001: net. 1ma. – S l i v e n: Sliven [38], 10 June 1982: net. 1fa (NMP 40924 [S+B]); – Sliven, gallery near Zmejovi Dupki cave [39], 13 July 1979: net. 1ma, 12 August 1983: net. 1ma, 1ms, 1fa, 1fs; – Tvărdica, Tvărdiški Prohod pass, Bukovec cottage [40], 17 July 1987: coll. 1ma (NMP 50057 [S+B]; leg. M. Šálek). – S m o l j a n: Borino, Eminovata cave [41], 6 Nov. 1993: coll. 2 subfossil ind.; – Jagodina, Dolna Karanska Dupka cave [42], 16 August 1978: net. 7m, 2fs (coll. 2ma, 1fj; NMP 50427–50429 [S]); – Orehovo, cave 100 m W of the village [43], 24 August 1980: net. 1ma (NMP 49996 [S+A]), 29 June 1984: net. 1ma (NMP 50043 [S+A]; leg. T. Scholz & D. Král); – Orehovo, cave in a quarry [44], 24 August 1980: net. 1 ind., 25 August 1980: net. 4ma (NMP 50336 [S+A], 50335, 50337, 50338 [A]). – S o f i j a: Lakatnik, Temnata Dupka cave [45], 9 July 1982: net. 1ms; – Lipnica, Kozarnika cave [46], 21 May 1997: net. 2 ind. (leg. R. Pandurska); – Sofija [47], store building, 1 Febr. 1965: coll. 1ma (IVB 1 [S]; leg. V. Beškov), around buildings in the center (Veliko Tărnovo str.), 8 April 1998: det. 3 ind., 28 May 2000: det. 3 ind. (cf. Nissen et al. 2001), Oborište str., building, 19 July 1995: coll. 1ma, 1fa (NMNHS 042), building in the town center, 8 Jan. 1997: obs. 2ma, 23 April 1997: coll. 1ma (NMNHS 104; leg. P. Beron), 14 August 1999: obs. 1ma, 5 July 2000: coll. 1mj (NMNHS 171; leg. N. Simov), 15 July 2001: coll. 1ma (NMNHS 152), 1 August 2001: coll. 1fj (NMNHS 147; leg. E. Simova), 31 August 2002: obs. 1m, 22 July 2003: obs. 1m; – Sofija, Krasno Selo [48], building, 18 Sept. 1995: coll. 1ma (NMNHS 051; leg. R. Pandurska). – S t a r a Z a g o r a: Tăža, Džendema reserve [49], small caves, 29 August 1997: net. 3 ind. (leg.

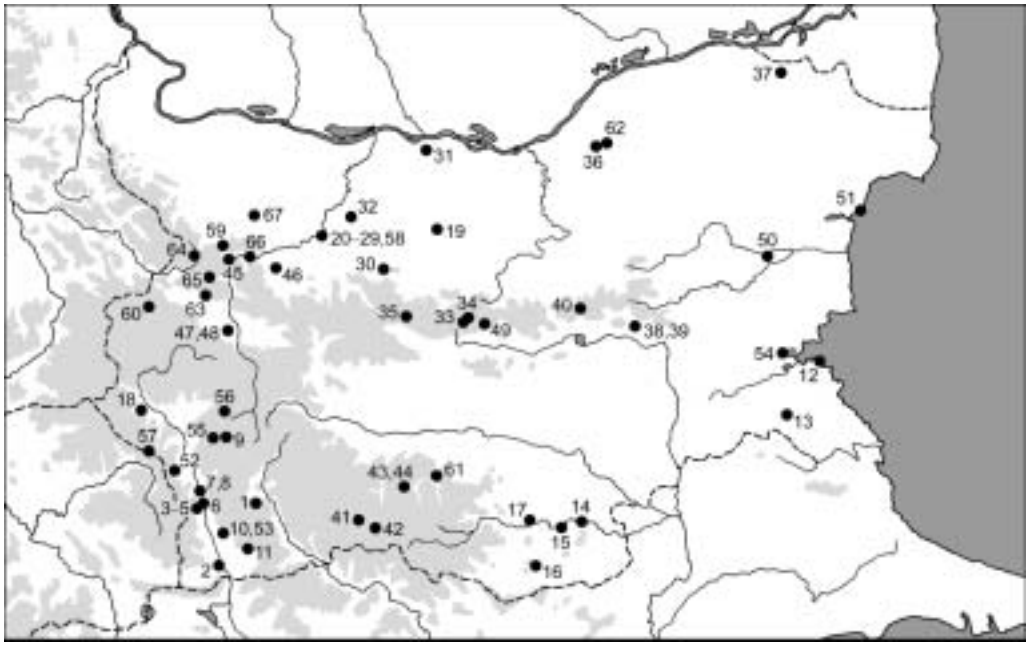

Fig. 19. Records of *Hypsugo savii* (Bonaparte, 1837) in Bulgaria. Numbers correspond with locality numbers in the text.

V. Beškov & R. Pandurska, cf. Ivanova 1998, Beron et al. 2000a). – V a r n a: Komunari [50], rocky labyrinth NE of the town, 12 July 1979: net. 1ma, 1fa; – Varna, Evksinograd [51], building, 7 Oct. 1926: coll. 1ma (NMNHS 079; leg. I. Bureš). – **Published data**: B l a g o e v g r a d: Leško [52], cave, 8 June 1996: net. 1 ind. (Pandurska & Beshkov 1998b); – Ploski [53], rocky crevice, 6 June 1990 (Pandurska & Beshkov 1998b). – B u r g a s: Burgaskite Ezera lakes [54], Sept.–Oct. 2002 (Pandurski 2003). – K j u s t e n d i l: Pastra, Rilska Reka valley, Krusta [= Krăsta] rock [55], 700 m a. s. l. (Beron et al. 2000b); – Paničište, Bezimenna cave [56], 1200 m a. s. l. (Beron et al. 2000b); – Vetren, Goljamata cave [57], 8–9 June 1996: net. 1 ind. (Pandurska & Beshkov 1998b). – L o v e č: Karlukovo, Zadănen Dol near Prohodna cave [58], summer 1988: 5 ind. (Popov & Ivanova 1995), summer 1989: 16 ind. (Popov & Ivanova 1995), summer 1990: 6 ind. (Popov & Ivanova 1995), summer 1991: 10 ind. (Popov & Ivanova 1995), autumn 1991: 5 ind. (Popov & Ivanova 1995), spring 1992: 2 ind. (Popov & Ivanova 1995), summer 1992: 5 ind. (Popov & Ivanova 1995). – M o n t a n a: Gorna Bela Rečka [59], gallery, 1991–1998 (Pandurska & Beshkov 1998a). – P e r n i k: Filipovci, Filipovskata Peštera cave [60], 27 August 1994 (Beron 1994). – P l o v d i v: Bačkovo, 1 km S of the monastery [61], 14 June 1960: 1m (Beron 1961). – R u s e: Pisanec [62], cave, Jan. 1992: 1 ind. (Undžijan 1998). – S o f i j a: Beledie Han, Kolibata cave [63], 1991–1998 (Pandurska & Beshkov 1998a); – Ginci, Dinevata Pešt cave [64], nettings 1991–1994: 1 ind. (Pandurska et al. 1999), 1991–1998 (Pandurska & Beshkov 1998a); – Iskrec, Dušnika cave [65], 1991–1998 (Pandurska & Beshkov 1998a); – Lipnica, Kozarnika cave [46], 1991–1998 (Pandurska & Beshkov 1998a). – V r a c a: Elisejna, Četvartitata cave [66], 1991–1998 (Pandurska & Beshkov 1998a); – Liljače, Božija Most cave [67], 13 August 1987: net. 1fa (Grimmberger 1993).

DISTRIBUTIONAL STATUS (Fig. 19). This petrophilous Mediterranean species was not considered as a member of Bulgarian fauna for a rather long time. It was not mentioned in any report on Bulgarian bats until 1960s (Bureš 1917, Kovačev 1925, Heinrich 1936, Wolf 1940, Hanák & Josifov 1959). Beron (1961) was the first who published records of *H. savii* in Bulgaria. Subsequent field work since the 1970s revealed that in rocky habitats it is a common species particularly in the mountains, deep river canyons and karstic terrains in southern and central Bulgaria. At present, 67 records are available (Tab. 11) covering nearly the whole Bulgarian territory. Surprisingly, the species seems to be very rare in the north of Balkans and in eastern Bulgaria what corresponds with its rarity in the northern Balkans: there are only two records in Romania, one from Banat (Topál 1959), the other from the Romanian Dobrogea (Răduleț 1996). Till now, *H. savii* was never recorded in the Danubian Lowland north of Danube. In contrast, the species is more common in the western Balkans where from it penetrated to the northern part of the Pannonian lowland up to northern Hungary and southern Moravia (Horáček & Benda in press). The distribution and abundance of *H. savii* in south-Balkan countries neighbouring with Bulgaria are roughly similar including Greece (Hanák et al. 2001), Macedonia (Kryštufek et al. 1992, 1998, Stojanovski 1994) and Albania (Hanák 1964, Uhrin et al. 1996a). In contrast, the species has not been recorded in the Turkish Thrace (Benda & Horáček 1998, Özgül et al. 2000).

Most records of *H. savii* in Bulgaria concern individuals netted in rocky niches, over water and at the entrances to caves, mines and tunnels, the rest are findings in buildings within smaller settlements as well as towns and cities (Kjustendil, Sofia, Varna). Though in more instances we observed evening departures of colonies (supposedly nurseries) from rocky fissures, no nursery colony was sampled just at its roost. In any case, the roosting preference for fissures in inaccessible rocky massifs and in wals of buildings is apparent. The localities of *H. savii* are distributed from the sea level up to 1700 m a. s. l. (Rogačevata cave near Kalofer), most records are situated up to 900 m a. s. l. External and cranial dimensions of examined specimens of *H. savii* from Bulgaria are shown in Tab. 7.

Pipistrellus pipistrellus (Schreber, 1774) s. l.

RECORDS. **Original data**: B l a g o e v g r a d: Brežani, village square, 17 Sept. 1988: det. hunting colony; – Gorna Breznica, over a brook, 14 July 1982: net. 1ma (NMP 50032 [S+B]), 19 July 1982: net. 1ma; – Ploski, village square, 8 July 1986: obs., det. – B u r g a s: Ahtopol, 12 Sept. 1982: coll. 1ma (NMNHS; leg. P. Beron); –

Černomorec, town, 14 July 1987: net. 1fa, building in town (Police station), 14 July 1987: obs. colony ca. 45 ind. (net. 2mj, 2fa); – Kiten, over a river near sea shore, 5 August 1984: net. 1ma, 1fa (NMP 50371, 50372 [A]); – Mičurin (= Carevo), 28 Febr. 1954: 1 ind. (ZIN; leg. V. Martino); – Primorsko, 31 July 1964: coll. 1fa (NMNHS; leg. P. Beron); – Primorsko, Arkutino, building, 11 July 1995: obs. nurs. colony of ca. 30 ind., exam. 4fa, 4mj, 30 June 1996: obs. nurs. colony of ca. 400 ind.; – Primorsko, Maslen Nos cape, abandoned building, 5 June 1957: coll. 1ma (NMP 49221 [S+B]; cf. Hanák & Josifov 1959); – Rakovskovo, roof of a wooden house, 21 August 1983: coll. 1fa (NMP 50038 [S+B]). – H a s k o v o: Dăbovec, Arda, above stream, 29 June 1983: net. 1ma, 10fa (coll. 1 ind., NMP 50039 [S]; cf. Hůrka 1984b); – Gaberovo, Gjurgen Dere, cave, 7 Oct. 1998: net. 1fa; – Madžarovo, building, 5 May 2003: coll. 1m. – K ă r d ž a l i: Dolno Lukovo, over Bjala Reka river, 11 June 1999: net. 1fa; – Ivajlovgrad, municipality building, 5 July 1995: obs.; – Meden Buk, over Bjala Reka river, 7 June 1996: net. 1ma; – Momčilgrad, Momčil Junak hut, creek, 19 June 1977: net. 1fa (NMP 49666 [S+A]); – Momčilgrad, town, 19 June 1977: 1fj found on a street; – Momčilgrad, over a water pool, 18 June 1977: net. 2ma, 2fa (NMP 49659–49662 [S+A]); – Orešari, Karangin cave, 17 Sept. 1996: net. 1ma (cf. Ivanova 1997). – L o v e č: Aprilci, Pleven hut, 14 August 1997: net. 1 ind. (cf. Ivanova 1998, Beron et al. 2000a), 23 May 1999: obs. 25fa (cf. Beron et al. 2000a); – Čiflik, Hajduška Pesen hut, gallery, 9 August 1997: net. 1ma (cf. Ivanova 1998, Beron et al. 2000a); – Karlukovo, small cave near Prohodna, 8 August 1978: net. 1ma (NMP 49765 [S+B]), 9 August 1978: net. 1ma (NMP 49766 [S+A]); – Karlukovo, ridge above rocky amphitheatre, 15 June 1977: net. 1ma, 1fa (NMP 49657, 49658 [S+A]). – P a z a r d ž i k: Batak, Cigov Čark, roof of a house, 9 July 1981: obs. colony of 103 ind., net. 45faL (coll. 1f, NMP 50004 [S+B]). – S l i v e n: Kotel, Nirica cave, abri, 15 July 1979: net. 1ma (NMP 49800 [S+A]). – S m o l j a n: Jagodina, brook near Jagodinska (= Imamova) Peštera cave, 15 August 1978: net. 1fa; – Mogilica, Uhlovica cave, 31 Dec. 2002: obs. 1 ind.; – Široka Lăka, above brook in the village, 14 August 1978: net. 1ma (NMP 49779 [S+A]). – S o f i j a: Lakatnik, cave, 6 Jan. 1951: 2f (ZIN; leg. V. Martino); – Lakatnik, Răžiškata (= Suhata) Peštera cave, 20 Febr. 1955: coll. 2ma, 4fa (NMP 50131–50135 [S+B]; cf. Hanák & Josifov 1959), 21 Dec. 1956: coll. 1 ind. (NMP 50144 [S+B]; cf. Hanák & Josifov 1959), 18 Nov. 1961: coll. 1ma (NMNHS; leg. P. Beron; cf. Guéorguiev & Beron 1962), 3 Jan. 1962: coll. 19fa, 7 ind. (NMP 49814–49827, 49829–49840 [S+B]; leg. J. Sklenář, cf. Dusbábek 1964a, b, Hůrka 1970), 10 Febr. 1965: coll. 11ma, 3ms, 13fa, 4fs (NMP 50105–50125 [S+B], IVB 15–25 [S+B]; cf. Sklenář 1969, Hůrka 1965, 1970); – Lakatnik, Temnata Dupka cave, 28 Jan. 1962: obs. 3ma, 6fa, coll. 1fa (NMP 50147 [B]; cf. Sklenář 1969), 16 Dec. 2002: obs. 1 ind.; – Sofija, 10 May 1923: coll. 1 ind. (NMNHS; leg. I. Bureš), botanical garden, 16 August 1922: coll. 1ma (NMNHS; leg. I. Bureš). – V r a c a: Roman, building, June 1918: coll. 1juv. ind. (NMNHS; leg. D. Ilčev). – **Published data**: B l a g o e v g r a d: Mehomija [= Razlog], caves, 20 April 1915 (Bureš 1917, Kovačev 1925), Razlog, 22 Oct. 1933 [NMNHS] (Hanák & Josifov 1959). – B u r g a s: Burgaskite Ezera lakes, Sept.–Oct. 2002 (Pandurski 2003); – Kačula (Strandža Mts.) 1961–1964 (from owl pellets) (Simeonov 1985); – Sozopol, 11 June 1957: obs. (Hanák & Josifov 1959); – Strandjabalkan [= Strandža Mts.], 1935 (Heinrich 1936). – D o b r i č: Dobrudža, undefined, June–July 1952 (Markov 1955b); – Onogur, 1 ind. (from owl pellet) (Mitev 1995). – G a b r o v o: Drjanovo, Drjanovski manastir, 1976–1978: 1 ind. (from owl pellets) (Simeonov 1983), 1 August 1989: net. 1m (Grimmberger 1993). – K ă r d ž a l i: Kărdžali, 15 Oct. 1927 [NMNHS] (Hanák & Josifov 1959). – L o v e č: Devetaki, Devetaškata Peštera cave, Sept. 1989: several tens ind. (Beškov 1993, Beshkov 1998); – Karlukovo, Zadănen Dol near Prohodna cave, summer 1989: 1 ind. (Popov & Ivanova 1995), summer 1992: 1 ind. (Popov & Ivanova 1995). – P l o v d i v: Mostovo, Garvanica [= Gargina] cave, 4 May 1978: 1 ind. (Nowosad et al. 1987); – Plovdiv, vicinity of the town, 7 Sept. 1935 (Heinrich 1936, Hopkins & Rotschild 1956), Plovdiv, 14 Sept. 1974: 1m (Skuratowicz et al. 1982). – R u s e: Kulata (Ruse) [= Ruse, Sredna Kula], small cave, 19 Sept. 1957: 1 ind. (Undžijan 1998); – Pisanec, 1 ind. (from owl pellets) (Mitev 1995), Pisanec, Bataklijata, 19 Sept. 1992: 1 ind. (Undžijan 1998); – Pisanec, Lom river valley, 20 and 25 May 1935: 8m (Heinrich 1936, Hopkins & Rotschild 1956); – Ruse, "măžkata gimnasija" building, 17 August 1959: 1 ind. (Undžijan 1998); – Tabačka, building, 26 June 1962: nurs. colony (Undžijan 1998). – S i l i s t r a: Srebărna, 21 June 1956: 2 ind. (Hristov 1961), school, 1956: 15–20 ind. (Markov & Hristov 1960). – S l i v e n: Sliven, 1970–1972: 1 ind. (from owl pellets) (Simeonov 1978). – S o f i j a: Iskrec, Dušnika cave (Bureš 1925); – Kokaljane, Urvič, galleries (Beron 1958); – Lakatnik, cave (Beron 1973a), Febr. 1911: 1m, 1f (Bureš 1917), 5 Febr. 1912 [2fa, NMNHS] (Bureš 1917), 11 March 1912: many inds (Bureš 1917, Kovačev 1925), 4 March 1962 (Jančev & Stojkova 1973), 19 March 1964 (Jančev & Stojkova 1973); – Lakatnik, Golemata Vraža Dupka cave, 24 Jan. 1960 (Beron 1962); – Lakatnik, Răžiškata (= Suhata) Peštera cave, 1955 (Beron 1958, 1963), 3 March 1964 (Kolebinova & Beron 1965, Beron 1968), 15 Jan. 1966: 23 ind. (Hůrka 1970), 25 Nov. 1966 (Beron 1968), 1991–1998 (Pandurska & Beshkov 1998a); – Lakatnik, Sedmovratica cave, 8 Nov. 1958 (Beron 1962); – Lakatnik, Temnata Dupka cave (Beron 1958); – Sofija, 1 Sept. 1955 [NMNHS] (Hanák & Josifov 1959). – Š u m e n: [Preslav], Patlejna reserve, 1973–1975 (from owl pellets) (Simeonov 1985). – V a r n a: Kamčija river, 2 and 3 August 1935 (Heinrich 1936, Hopkins & Rotschild 1956); – Varna, Galata (Kovačev 1908). – V i d i n: Belogradčik, caves, 9 July 1986: 1mj (Grimmberger 1993). – V r a c a: Leva river, cave, 15 April 1915 (Bureš 1917, Kovačev 1925).

Pipistrellus pipistrellus (Schreber, 1774) s. str.

RECORDS. **Original data**: B l a g o e v g r a d: Bansko, Bănderica hut [1], 10 Sept. 1938: coll. 1ma (NMNHS; leg. S. Konsulov); – Belasica, on the road to Belasica hut [2], 30 April 2001: det. and obs. 2ma. – B u r g a s: Burgas [3], building, 11 August 1994: coll. 1ma (NMNHS 080; leg. Z. Boev); – Černomorec [4], building, 26 June 1993: coll. 1ma (NMNHS 048); – Malko Tărnovo [5], building in the city center, 3 Sept. 2002: obs. and det. colony of ca. 100 ind. – H a s k o v o: Careva Poljana [6], 7 Oct. 2003: det. several ind. (leg. R. Lučan); – Madžarovo [7], building, 24 Nov. 2001: obs. & det. 1ma; – Madžarovo, rocky cliffs [8], 30 Sept. 2003: det. several ind. (leg. R. Lučan). – K ă r d ž a l i: Huhla, Ivajlovgrad dam [9], building, 5 July 1995: det. and obs. ca. 40 ind., 10 July 1995: det. and obs. nurs. colony of ca. 150 ind., net. 40 ind., 2 May 1996: obs. 92 ind.; – Krumovgrad [10], Krumovica river, bridge, 3 Oct. 2003: net. 5ma, 1ms, 1fa (leg. R. Lučan). – K j u s t e n d i l: Rilski Manastir, Kravarsko Dere [11], building, 28 June 2001: obs. and det. nurs. colony of ca. 60 ind., exam. 6faL (leg. N. Simov). – P l o v d i v: Gara Kričim [12], 8 Sept. 1939: 1 ind. (ringed near Vasilevka, Peresčepino Dist., Dnipropetrovs'k Region, Ukraine, at 28 June 1939; Bureš 1941, 1942, Popov 1941, Kameneva & Panjutin 1960, Bureš & Beron 1962, Strelkov 1969, 1971); – Plovdiv [13], 1 Sept. 1937: coll. 1ma (NMNHS; leg. P. Cvetarov; cf. Hanák & Josifov 1959). – R a z g r a d: Voden [14], 15 Nov. 1940: coll. 1 ind. (NMNHS; leg. M. Karpačev). – R u s e: Beljanovo [15], over Jantra river, 30 Sept. 1999: det. min. 1 ind.; – Červen [16], cliff under ancient town, 3 Oct. 1999: det. min. 1 flying ind.; – Nisovo [17], near village, 2 Oct. 1999: det. mating calls; – Pepelina, Orlova Čuka cave [18], 4 Oct. 1999: det. min. 1 ind.; – Pepelina, rocky cliff [19], 4 Oct. 1999: det. mating calls; – Pisanec, Bataklijata guest house [20], forest, 3 Oct. 1999: det. min. 1 ind.; – Pisanec, Goljamata Peštera cave [21], 3 Oct. 1999: det. min. 1 ind.; – Ruse, Lom river estuary [22], 1 Oct. 1999: det. min. 1 ind.; – Svalenik [23], Bjalata Stena cliff, 3 Oct. 1999: det. mating calls. – S l i v e n: Kipilovo, Kipilovskata Peštera cave [24], 1 May 1934: coll. 2fa (NMNHS 074, 075; leg. I. Tarpanov). – S o f i j a: Iskrec [25], 25 Sept. 1960: coll. 1ma (NMNHS 015; leg. V. Beškov); – Lakatnik [26], 14 Dec. 1922: coll. 1ma (NMNHS 179; leg. M. Šosev; cf. Hanák & Josifov 1959); – Lakatnik, Răžiškata (= Suhata) Peštera cave [27], 16 Dec. 2002: obs. 10 ind. (coll. 1ms, NMP 50439 [A]); – Sofija [28], student town, building, 18 August 1993: coll. 1fa (NMNHS 050).

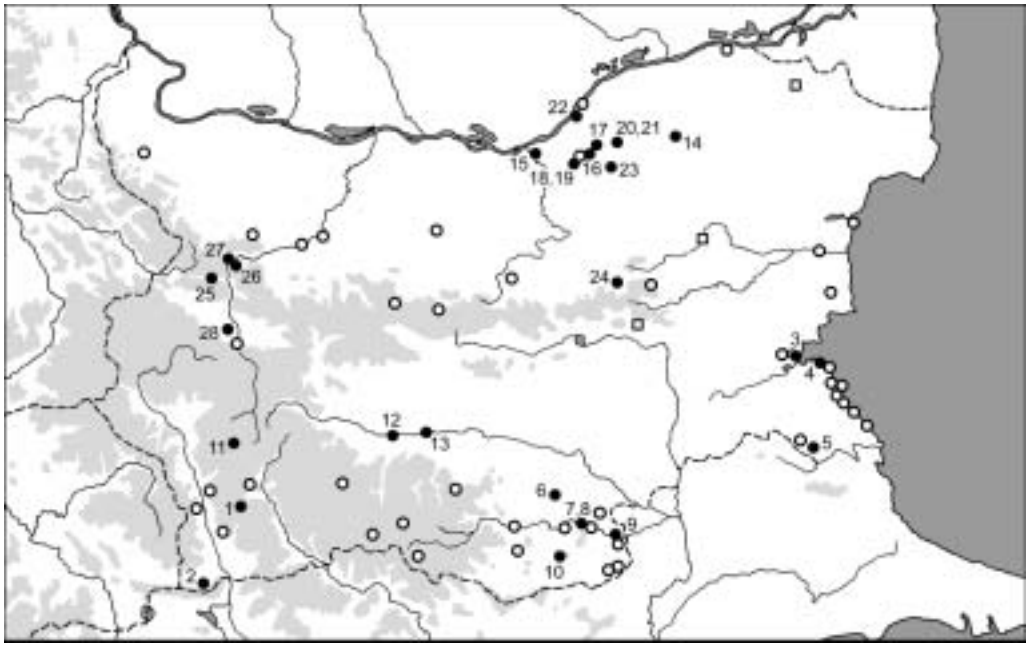

Fig. 20. Records of *Pipistrellus pipistrellus* (Schreber, 1774) (closed symbols) in Bulgaria. Open symbols represent unidentified records of *P. pipistrellus* s. l. (*P. pipistrellus* or *P. pygmaeus*). Explanation of symbols as in Fig. 3. Numbers correspond with locality numbers in the text.

Pipistrellus pygmaeus (Leach, 1825)

Record. **Original datum**: H a s k o v o: Madžarovo [1], slope over the Arda river, behind tree bark, 12 Sept. 2001: coll. 1ma (cf. Dietz et al. 2002).

Comments. Bats of the *P. pipistrellus* complex (= *P. pipistrellus* s. l.) are very common in Bulgaria as shown by both number of localities (Fig. 20) and number of individuals observed flying at dusk in nearly of human settlement from small villages to large cities, mainly at low and medium elevations (maximum in Pirin Mts., 1810 m a. s. l.). *P. pipistrellus* s. l. was also mentioned in all papers about the bats of Bulgaria (Bureš 1917, 1925, 1942, Kovačev 1925, Heinrich 1936, Kvartirnikov 1956, Hanák & Josifov 1959, Beron 1958, 1962, Atanassov & Peschev 1963). Concerning habitats and collection methods, most records of *P. pipistrellus* s. l. comprise bats observed when hunting in intravillans and along rivers and individuals netted in human settlements, over water, in rocky gorges and at the entrances to underground spaces. Nursery colonies were found in both buildings and rock crevices, hibernating individuals were discovered as well. The biology of Bulgarian pipistrelles seems to be similar to that in central Europe but population density appears to be higher in Bulgaria.

Unfortunately, many records cannot be allocated to either of the two phonic types, 45 or 55 kHz, respectively, which respresent two species (Barrat et al. 1997). Most of those precisely identified according to the detection of ultrasound calls and morphologic characters (sensu Häussler et al. 2000, see Records) concern *P. pipistrellus* s. str. There is only one record of bat identified as *P. pygmaeus*, from south-eastern Bulgaria (Dietz et al. 2002) (Fig. 25). Further research is necessary to elucidate the situation; according to Helversen & Holderied (2003), the whole territory of south-eastern Europe belongs to the distribution range of *P. pygmaeus*. Present data on the distribution of the two species belonging to the *P. pipistrellus* complex in Greece (Mayer & Helversen 2001, Hanák et al. 2001) suggest that in the south of the Balkan Peninsula, population densities and habitats of the two species are similar. So far, only few specimens were identified from other Balkan countries (Benda et al. 2003a, Gheorghiu et al. 2001, Hulva et al. in press).

Bureš (1941, 1942) and Popov (1941) published a record of long migration of a female *P. pipistrellus* s. l. (after the present conception) from Ukraine to Bulgaria. The bat moved to a distance of ca. 1150 km within 70 days (Bureš 1941). Kuzjakin (1950) doubted the species determination and supposed that the individual was rather *P. nathusii*. Bureš & Beron (1962) revised the specimen with the result that it did belong to *P. pipistrellus* and that conclusion was accepted by subsequent authors (Strelkov 1969, 1971, Panjutin 1980, Masing et al. 1999, etc.). For many years, the specimen (NMNHS 214) was exhibited in the zoological exposition of the National Museum of Natural History in Sofia. Later on, it was removed from the exposition and reexamined. It was a dry specimen with skull inside (not a prepared skin) and spread wings (see Bureš 1941) having a bat band on its right forearm with a code MOSKWA 81121. This is in agreement with the previously published data (Bureš 1941, Bureš & Beron 1962). Bureš & Beron (1962) gave the forearm length as 29.8 mm, we found 30.6 mm (LAt^{+}, forearm length incl. wrist) and the condylobasal length of 11.08 mm. The measurements correspond to the *P. pipistrellus* complex (e. g., Schober & Grimmberger 1998, Popov & Sedefčev 2003) but do not enable to allocate the specimen to either *P. pipistrellus* or *P. pygmaeus* (but it certainly does not represent any other species of *Pipistrellus*). To conclude, a banded bat found in Kričim near Plovdiv, as originally reported by Bureš (1941), belongs to one of the two species of the *P. pipistrellus* complex. Alternatively, the specimen can be a falsum made for the museum exposition, but we do not believe this.

Therefore, some populations of either *P. pipistrellus* or *P. pygmaeus* or both are migratory and can move from eastern Europe to Bulgaria. The distance of 1150 km represents the longest migration of *P. pipistrellus* s. l. recorded so far (Masing et al. 1999).

Pipistrellus nathusii (Keyserling et Blasius, 1839)

RECORDS. **Original data**: B l a g o e v g r a d: Kresna, Gara Pejo Javorov [1], over Oštavska Reka river, 4 Sept. 1997: net. 1fa (cf. Petrov 2001). – B u r g a s: Rakovskovo [2], roof of a wooden house, 21 August 1983: coll. 2ma, 1fa (NMP 50035–50037 [S+B]; cf. Hůrka 1984b). – H a s k o v o: Madžarovo, rocky cliffs [3], 30 Sept. 2003: det. several ind. (leg. R. Lučan). – J a m b o l: Ustrem, Sveta Troica monastery [4], 1 May 1926: coll. 1ma (NMNHS 078; leg. N. Radev). – K ă r d ž a l i: Krumovgrad [5], Krumovica river, bridge, 3 Oct. 2003: net. 1fs (leg. R. Lučan). – P a z a r d ž i k: Pazardžik [6], 12 April 1955: 1fa (ZIN; leg. A. Prostov). – R u s e: Beljanovo, over Jantra river [7], 30 Sept. 1999: det. min. 1 ind.; – Červen, cliff under an ancient town [8], 3 Oct. 1999: det. min. 1 ind.; – Krivina, over Dunav river [9], 30 Sept. 1999: det. min. 1 ind.; – Nikolovo, park Teketo [10], 1 Oct. 1999: det. males and mating place; – Nisovo [11], in cliffs, 2 Oct. 1999: det. males and mating place; – Pepelina [12], rocky cliff, 4 Oct. 1999: det. males and mating place; – Pisanec, Bataklijata guest house [13], forest, 3 Oct. 1999: det. min. 1 ind.; – Pisanec, Goljamata Peštera cave [14], 3 Oct. 1999: det. males and mating place; – Ruse [15], town, 1 Oct. 1999: det. min. 1 ind., over Dunav river 5 km SW, 1 Oct. 1999: det. min. 1 ind.; – Ruse, Lom river estuary [16], 1 Oct. 1999: det. min. 1 ind.; – Svalenik [17], Bjalata Stena cliff, 3 Oct. 1999: det. males and mating place. – S o f i j a: Pasarel, over the Iskar river [18], 18 August 1994: net. 1ma (NMNHS 070); – Sofija [19], 1972: coll. 1ma (NMNHS; leg. T. Mičev), Museum building, 3 Sept. 1931: coll. 1fa (NMNHS 140; leg. I. Konstantinov). – **Published data**: B l a g o e v g r a d: Bansko, Vihrenska Propast chasm [20], 2660 m a. s. l., 1 ind. (Beron 1999). – B u r g a s: Burgas [21], city, Sept.–Oct. 2002: hundreds of ind. (Pandurski 2003); – Burgaskite Ezera lakes [22], Sept.–Oct. 2002 (Pandurski 2003); – Sosopel [= Sozopol] [23], 8 May 1938: 1m, 3f [ZFMK 39.87–90] (Wolf 1940). – D o b r i č: Dobrudža, undefined [*24*] (Markov & Hristov 1960). – P a z a r d ž i k: Golak [25], cave, 31 March 1963: 1 ind. (Jančev & Stojkova 1973). – P l o v d i v: Sadovo [26], hollow tree, 20 Sept. 1914: 1ma [NMNHS] (Bureš 1917, Kovačev 1925). – S o f i j a: Kostenec, Banja [27], 20 June 1931 [1ma, NMNHS 207, leg. I. Mărkvička] (Hanák & Josifov 1959); – Sofija [19], 1 May 1965 (Jančev 1971, Jančev & Stojkova 1973), 27 August 1971 (Beron 1973a, b, 1974b). – V a r n a: Krivnja [28], 8 May 1958: 1ma (ringed in Voronež Reserve, Russia, at 12 July 1956; Panjutin 1968, 1980, Strelkov 1969, 1971; the bat was missidentified as *M. mystacinus* by Bureš & Beron 1962 and Pokrovskij & Ščadilov 1962).

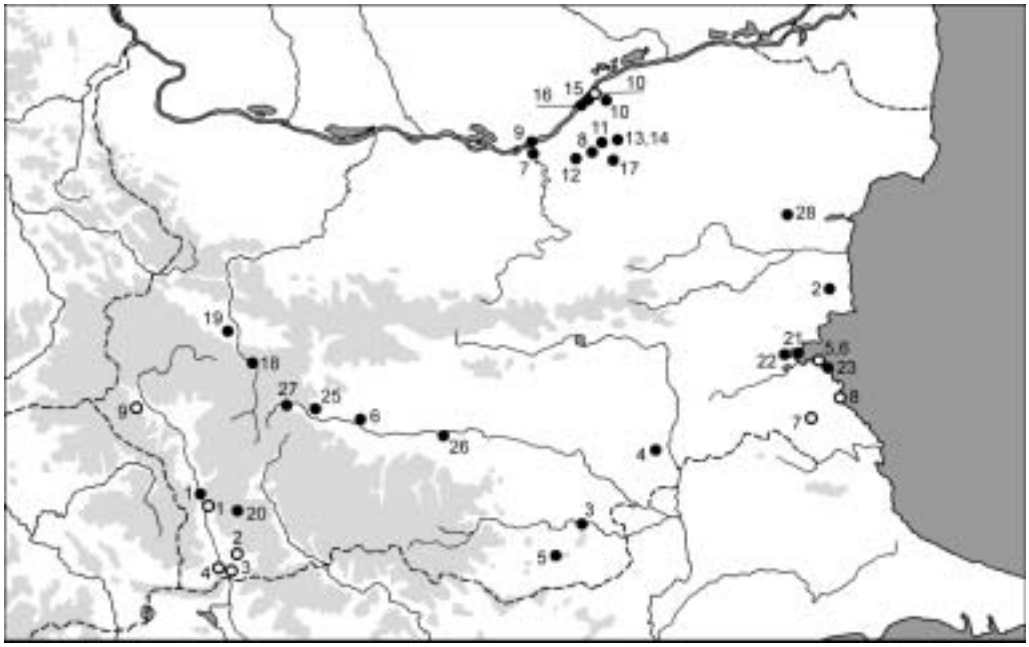

Fig. 21. Records of *Pipistrellus nathusii* (Keyserling et Blasius, 1839) (closed symbols) and *P. kuhlii* (Kuhl, 1817) (open symbols) in Bulgaria. Numbers correspond with locality numbers in the text.

Tab. 9. Basic biometric data for examined Bulgarian samples of *Pipistrellus nathusii* (Keyserling et Blasius, 1839), *P. kuhlii* (Kuhl, 1817), and *Nyctalus noctula* (Schreber, 1774). For abbreviations see p. 250

	Pipistrellus nathusii					*Pipistrellus kuhlii*					*Nyctalus noctula*				
	n	min	max	M	SD	n	min	max	M	SD	n	min	max	M	SD
LC	4	45.0	49.0	47.0	1.826	–	–	–	–	–	8	76.0	82.0	79.5	2.330
LCd	4	36.0	40.0	37.8	2.062	–	–	–	–	–	8	48.0	58.0	54.4	3.021
LAt	6	33.5	35.6	34.4	0.700	–	–	–	–	–	8	52.8	56.8	53.9	1.257
LA	4	14.0	14.5	14.1	0.250	–	–	–	–	–	8	16.0	19.0	17.4	1.061
LTr	–	–	–	–	–	–	–	–	–	–	8	6.0	10.0	8.6	1.382
G	–	–	–	–	–	–	–	–	–	–	7	24.0	34.0	29.6	3.101
LCr	6	13.09	13.56	13.28	0.195	4	13.15	13.68	13.45	0.222	12	18.19	19.53	18.61	0.324
LCb	6	12.42	12.97	12.72	0.223	4	12.76	13.08	12.97	0.149	12	18.33	19.76	18.85	0.348
LaZ	4	8.00	8.59	8.42	0.278	3	8.26	8.68	8.50	0.215	10	12.60	13.68	13.24	0.273
LaI	10	3.51	3.97	3.73	0.133	4	3.25	3.51	3.36	0.108	12	4.82	5.40	5.11	0.163
LaN	9	6.73	7.31	7.03	0.198	4	6.54	7.04	6.69	0.234	12	9.54	10.18	9.87	0.247
AN	6	4.42	4.77	4.67	0.131	4	4.68	4.80	4.76	0.057	12	6.54	7.27	6.82	0.222
CC	9	3.82	4.24	3.98	0.117	4	4.03	4.19	4.12	0.077	11	7.21	7.63	7.40	0.116
M^3M^3	9	5.13	5.66	5.34	0.180	4	5.55	5.75	5.63	0.084	12	8.36	8.98	8.70	0.189
CM^3	9	4.36	4.76	4.52	0.122	4	4.87	5.12	5.01	0.103	12	7.13	7.52	7.36	0.137
LMd	5	8.97	9.51	9.26	0.228	4	9.68	9.92	9.81	0.104	12	14.00	14.85	14.39	0.261
ACo	9	2.32	2.70	2.45	0.127	4	3.03	3.17	3.12	0.060	12	4.36	5.42	4.64	0.272
CM_3	9	4.50	4.93	4.75	0.136	4	5.34	5.44	5.41	0.048	12	7.53	8.17	7.79	0.171

Distributional status (Fig. 21). Historical data (Bureš 1917, Wolf 1940, Hanák & Josifov 1959) as well as new records of *P. nathusii* in Bulgaria comprise 28 localities (Tab. 11). Most records concern lowlands and highlands up to 800 m a. s. l., with an average of 305 m a. s. l., the only exception being a record in the Pirin Mts. at the elevation of 2660 m a. s. l. (Beron 1999). The dates of collection (March–May, August–October) indicate that the respective individuals, both males and females, were captured while on migration from or to the more northwardly situated territories of the species distribution range (cf. Strelkov 1969, 1971). There is no evidence of a permanent occurrence and reproduction of *P. nathusii* on the territory of Bulgaria. Theoretically, a resident population could exist in certain floodplain regions, mainly in the Danubian Lowland. A colony of males and females was found in spring in Albania (Hanák 1964), a pregnant female was recorded in summer in Greece (Hanák et al. 2001) and an adult female was recorded in summer in Macedonia (Kryštufek et al. 1992). In spite of this, the majority of hitherto records is consistent with conclusions of the analysis made by Strelkov (1997, 1999, 2000) and Strelkov & Abramov (2001), according to which the territory of the Balkan Peninsula does not belong to the area of reproduction of *P. nathusii* and the individuals migrating to it are represented by males and not reproducing females. External and cranial dimensions of examined specimens of *P. nathusii* from Bulgaria are shown in Tab. 9.

Note. Migration of *P. nathusii* to Bulgaria has been documented by an individual banded in south-western Russia and recaptured in eastern Bulgaria (Bureš & Beron 1962, Panjutin 1960, 1968, Strelkov 1969, 1971). This record was twice erronously (and independently) interpreted as a migration of *Myotis mystacinus* (Bureš & Beron 1962, Pokrovskij & Ščadilov 1962). However, the respective individual was *P. nathusii* without any doubt (Panjutin 1968). Originally, also the length of the movement was miscalculated to 1950 km (Bureš & Beron 1962) which, unfortunately, was adopted by some other athors. The real distance between the site of marking and that of recapture is ca. 1300 km (Pokrovskij & Ščadilov 1962, Panjutin 1968, Strelkov 1969, 1971). Migrations of *P. nathusii* from south-western Russia to the Balkans were documented by recaptures of banded individuals in Greece and European Turkey as well (Kameneva & Panjutin 1960, Panjutin 1968).

Pipistrellus kuhlii (Kuhl, 1817)

RECORDS. **Original data**: B l a g o e v g r a d: Kresna [1], building, 13 Oct. 1995: coll. 1fa (NMNHS 052; leg. A. Stojanov); – Melnik [2], building, 20 June 2000: coll. 1 ind. (NMNHS); – Novo Konomladi [3], on the road to Marikostinovo, 17 Sept. 1996: coll. 1fa (NMNHS 137); – Rupite [4], building, 24 Febr. 1991: coll. 1ma (NMNHS; leg. D. Kantardžiev, cf. Ivanova & Popov 1994). – B u r g a s: Černomorec [5], lake in a quarry, 18 July 1987: net. 1ms; – Černomorec [6], town, 14 July 1987: net. 1ma, 1fa; – Kalovo [7], over Mladežka river, 27 August 1999: net. 1fa; – Primorsko [8], Perla, building, 17 Dec. 1995: coll. 1fa (NMNHS 046). – K j u s t e n d i l: Kjustendil [9], building, 10 August 1997: obs. nurs. colony, exam. 2mj, 2fa, 2fj (coll. 3 ind., NMNHS 110–112; leg. O. Vitov), 10 Oct. 2001: obs. colony, coll. 1ma (NMNHS 177; leg. O. Vitov). – **Published data**: R u s e: Ruse [10], building of District Library, 23 Sept. 1998: coll. 1 ind. (Undžijan 1998).

DISTRIBUTIONAL STATUS (Fig. 21). Despite of intensive search for this Mediterranean species in various regions of Bulgaria, particularly in 1970s and 1980s, *Pipistrellus kuhlii* has long been not recorded in Bulgaria. The first record was obtained as late as in 1991 (cf. Ivanova & Popov 1994). Since then *P. kuhlii* is recorded in Bulgaria in ten localities concentrated into two mutually distant regions. Most records come from the Struma River valley in SW Bulgaria from the town Kjustendil to the Greek border. Not only individuals but also a nursery colony was found there in 1997. The distribution of *P. kuhlii* continues southwards in the Greek Macedonia and Thrace where the species is fairly common (Hanák et al. 2001) and in Macedonia (Kryštufek et al. 1992, 1998, Stojanovski 1994). The second region with only four records is that between Strandža Mts. and the coast of Black Sea up to the Burgas Bay. This area links to the eastern part of Greek Thrace and to Turkish Thrace from where the species has also been documented, although by two records only (Benda & Horáček 1998, Hanák et al. 2001). There is a single record of *P. kuhlii* in the Danubian Lowland by Undžijan (1998) but it needs to be revised due to its isolation from the localities in southern Bulgaria.

According to our present interpretation, the northern border of distribution of *P. kuhlii* in the eastern Balkans runs through south-western and south-eastern Bulgaria. The two regions mentioned above have been known as pathways of penetration of various Mediterranean elements from the south to Bulgaria and further north into the central part of the eastern Balkans (Georgiev 1982, 1997) including small terrestrial mammals (cf. Vohralík & Sofianidou 1992, 2000). The occurrence of *P. kuhlii*, as one of Mediterranean elements, in these regions is hence not much surprising. The question is, however, for how long have populations of this species colonize these regions: if for long time or only recently. The conspicious range extension of *P. kuhlii* during the last decade resulting also in its recent spread in central Europe (Bauer 1996, Fehér 1995) and eastern Europe (Strelkov et al. 1985, Merzlikin & Lebed' 2001) should be mentioned in support of the latter possibility. External and cranial dimensions of examined specimens of *P. kuhlii* from Bulgaria are shown in Tab. 9.

Nyctalus noctula (Schreber, 1774)

RECORDS. **Original data**: B l a g o e v g r a d: General Todorov, Pčelina hill [1], quarry, 5 August 1994: 1 ind. from *Bubo bubo* pellets (cf. Obuch & Benda 1996); – Petrič, 2 km E of town [2], 19 June 1957: coll. 1ma (NMP 49348 [S+B]; cf. Hanák & Josifov 1959). – B u r g a s: Burgas [3], near Vaja lake, 22 March 2001: coll. 1ma (NMNHS 143; leg. T. Mičev); – Gramatikovo [4], over Veleka river, 23 August 1999: net. 2ma; – Stoilovo [5], over Dokuzak river, 24 August 1999: net. 1ma, 1fa. – D o b r i č: Albena [6], 14 Oct. 1965: coll. 1ma, 1fa (NMP 50148, 50149 [S]), Albena, covering of building, 21 August 1983: obs. colony 11 ind (coll. 1mj, 2fj); – Albena, sea shore, river mouth [7], 21 August 1983: net. 1ms, 3fs. – H a s k o v o: Careva Poljana [8], 7 Oct. 2003: det. several ind. (leg. R. Lučan); – Dolno Čerkovište, Orešari reserve [9], 30 Sept. 2003: obs. 3 ind. (leg. R. Lučan); – Popovec [10], 6 Oct. 2003: det several ind. (leg. R. Lučan); – Svilengrad [11], 17 April 1939: coll. 1 ind. (NMNHS; leg. S. Arabov). – K ă r d ž a l i: Malko Kamenjane [12], Krumovica river, 4 Oct. 2003: det. several ind. (leg. R. Lučan); – Meden Buk [13], over Bjala Reka river, 7 June 1996: net. 2ma, 16 June 1998: net. 1ma, 23 July

2002: net. 1m. – L o v e č: Devetaki, Devetaškata Peštera cave [14], 1 Febr. 1997: obs ca. 20 ind., 23 March 1997: obs. ca. 100 ind., 24 Febr. 1998: obs. ca. 150 ind., 20 May 1999: net. 1ma (leg. C. Dietz), 7 Nov. 1999: obs. ca. 150 ind., 19 Jan. 2000: obs. ca. 350 ind., 3 April 2000: obs. colony of ca. 2000 ind. (exam. 33 ma), 3 June 2000: net. 1ma (NMNHS 142), 14 July 2000: obs., 24 Sept. 2000: obs. ca. 300 ind., 12 Jan. 2002: obs. ca. 100 ind.; – Karlukovo, ridge above rocky amphitheatre [15], 6 July 1976: net. 1ma (NMP 49366 [S+A]; cf. Hůrka 1984b); – Karlukovo, ridge of a rocky amphitheatre [16], 6 August 1978: net. 2ma, 1fa (NMP 49739–49741 [S+A]); – Karlukovo, small cave near Prohodna [17], 9 August 1978: net. 1ma (NMP 49768 [S+A]); – Karlukovo, Prohodna cave [18], 13 June 1977: net. 1ms (NMP 49639 [S+A]), 7 August 1978: net. 1ma (NMP 49746 [S+A]); – Karlukovo, Troevratica cave [19], 2 Oct. 1962: coll. 1 skull (IVB 9 [S]). – P l e v e n: Brăšljanica [20], small pond, 6 June 2001: det. ca. 10 foraging ind.; – Pleven [21], town, tree holow, 30 Sept. 1967: obs. (leg. A. Schmidt), 21 July 1972: obs. (leg. A. Schmidt), hotel building, 20 July 1972: obs. 263 ind. (leg. A. Schmidt), post office building, 23 Febr. 1999: obs. winter colony (coll. 1ma, 2fa, NMNHS 158–160). – R a z g r a d: Voden [22], 15 Nov. 1940: coll. 1 ind. (NMNHS; leg. I. Karpačev, cf. Bureš 1942). – R u s e: Beljanovo [23], crevices in rocky cliff, 30 Sept. 1999: det. male displays; – Červen, rocky cliff under ancient town [24], 3 Oct. 1999: det., plus advertisement call, 9 Sept. 2000: obs. flying ca. 20 ind., 4 Oct. 2003: obs. group of ca. 200 ind. in rocky crevice; – Červen, the road to Ivanovo [25], 29 Sept. 2002: obs. ca. 100 ind. flying and foraging in a "flock"; – Krivina, over Dunav river [26], 30 Sept. 1999: det. min. 1 ind.; – Nikolovo, park Teketo [27], 1 Oct. 1999: det. min. 1 ind.; – Nisovo, near the village [28], 2 Oct. 1999: det. min. 1 ind., plus mating calls; – Nisovo, in the cliffs [29], 2 Oct. 1999: det. males and mating place; – Novo Selo [30], tree hollow, 20 May 1989: obs. 1 ind. (leg. I. Mitev), 2 July 1989: obs. 1 ind. (leg. I. Mitev), 17 Sept. 1989: obs. 1 ind. (leg. I. Mitev); – Pepelina, Orlova Čuka cave [31], 4 Oct. 1999: det. males and mating place, det. flying around; – Pisanec, large fishpond [32], 3 Oct. 1999: det. min. 1 ind.; – Pisanec, Goljamata Peštera cave [33], 3 Oct. 1999: det. males and mating place; – Ruse [34], town, 1 Oct. 1999: det. min. 1 ind.; – Ruse, Lom river estuary [35], 1 Oct. 1999: det. min. 1 ind.; – Svalenik, Bjalata Stena cliff [36], 3 Oct. 1999: det. males and mating place. – S i l i s t r a: Nova Černa [37], Kalimok biological station, over a channel, 28 March 2001: net. 1 ind., 20 April 2001: net. 1ma. – S o f i j a: Bojana [38], Bojana Residence park, old tree, 4 Dec. 1998: coll. 1ma, 2fa (NMNHS 157); – Dragalevci [39], 7 August 1964: coll. 1 ind. (NMNHS; leg. P. Beron); – Kazičene [40], hollow tree, 18 April 1938: coll. 5 ind. (NMNHS; leg P. Gjorev), 4 Nov. 1940: coll. 1ma, 1 ind. (NMNHS; leg. P. Gjorev); – Lakatnik, Răžiškata (= Suhata) Peštera cave [41], 16 Dec. 2002: obs. at least 94 ind. (in clusters of 5+2+1+1+37+6+4+6+>26+6 ind.); – Sofija [42], building, 18 Nov. 1994: obs. 1ma, 16 Oct. 2000: obs. 1 ind., 23 Dec. 2002: obs. 1f, 9 Nov. 2003: obs. ca. 50 ind. (min. 10m, 4f). – S t a r a Z a g o r a: Tăža, Dždendema reserve [43], small caves, 29 August 1997: net. 2 ind. (leg. V. Beškov & R. Pandurska, cf. Ivanova 1998, Beron et al. 2000a). – Š u m e n: Šumensko Plato park [44], tree hollow, 28 June 2000: obs. (cf. Ivanova 2001). – V a r n a: Varna, Pobitite Kamăni [45], 29 Sept. 1967: skull in owl pellet (leg. A. Schmidt). – V e l i k o T ă r n o v o: Beljakovec, Preobraženski Manastir [46], tree hollow, 23 July 1972: obs. (leg. A. Schmidt); – Emen, Emenskata Peštera cave [47], 1 Febr. 1997: obs. ca. 200 ind., 21 Febr. 1998: obs. ca. 200 ind., 19 April 2000: obs. 1 ind. – V r a c a: Kunino, Čeloveča Dupka cave (Čeloveči Dol) [48], 21 May 2000: coll. 1 subfossil ind. – **Published data**: B u r g a s: Atanasovskoto Ezero lake [49], 1 ind. (from owl pellets) (Simeonov et al. 1981); – Brodilovo [50], 1962 (from owl pellets) (Simeonov 1985); – Burgaskite Ezera lakes [51], Sept.–Oct. 2002 (Pandurski 2003); – Gramatikovo [4], 1959: 4 ind. (Paspalev & Markov 1961); – Kačula (Strandža Mts.) [52], 1961–1964 (from owl pellets) (Simeonov 1985); – Karamlek [= Karamlăk = Mladežko] [53], Strandja-Balkan [= Strandža Mts.), 31 July 1935 (Heinrich 1936, cf. Theodor 1967); – Primorsko [54], 6 June 1957: obs. (Hanák & Josifov 1959); – Ropotamo river [55], 6 June 1957: obs. (Hanák & Josifov 1959). – D o b r i č: Albena [6] (Beron 1973a); – Dobrudža [*56*], undefined (Markov & Hristov 1960). – G a b r o v o: Drjanovo, Bačo Kiro cave [57], obs. (Grimmberger 1993); – Drjanovo, Drjanovski monastery [58], obs. flying ind. (Grimmberger 1993); – Gabrovo [59], obs. flying ind. (Grimmberger 1993). – L o v e č: Karlukovo, Zadănen Dol near Prohodna cave [60], summer 1988: 1 ind. (Popov & Ivanova 1995), summer 1989: 1 ind. (Popov & Ivanova 1995), summer 1991: 5 ind. (Popov & Ivanova 1995), summer 1992: 1 ind. (Popov & Ivanova 1995); – Karlukovo, near Svirčovica cave [61], 1 May 1958: many ind. (Beron 1958). – P a z a r d ž i k: Pazardžik [62], Ostrova Na Svobodata islands, Marica river, 3 Jan. 1961: 1fa (ringed in Voronež Reserve, Russia, at 13 August 1957; Bureš & Beron 1962, Strelkov 1969, 1971); – Peštera [63], 1958–1961 (Băčvarov 1963); – Semčinovo [64], 31 August 1936 [1ma, 1fa; NMNHS] (Hanák & Josifov 1959). – P e r n i k: Dimitrovo [= Pernik] [65], small cave (Kvartirnikov 1956). – P l o v d i v: Plovdiv, lowland in the vicinity of town [66], 1935 (Heinrich 1936); – Plovdiv [67], 1958–1961: 2 ind. (Băčvarov 1963); – Sadovo [68], 19 April 1915: 1 ind. (Bureš 1917, Kovačev 1925). – R a z g r a d: Voden [22], 19 Nov. 1940: 5 ind. (Bureš 1941, 1942). – R u s e: Červen [23] (Mitev 1995); – Ivanovo [69], April 1990: 22 ind. (from owl pellets) (Mitev 1995), cave, 15 August and 22 Sept. 1957 (Undžijan 1998); – Ivanovo, Rusenski Lom river valley [70], 3 August 1968: obs. flying inds (Undžijan 1998); – Krasen [71], 13 March 1964 (Undžijan 1998), 27 Febr. 1994: obs. 1 ind. (Mitev 1995); – Nikolovo, park Teketo [27] (Kovačev 1906), behind tree bark, 24 April and 16 May

1974: 8 ind. (Undžijan 1998); – Nisovo [28], 10 ind. (from owl pellets) (Mitev 1995), 7 Oct. 1989: obs. flying inds (Mitev 1995); – Pirgovo [72], 10 Oct. 1960: obs. flying inds (Undžijan 1998); – Pisanec, Lom river valley [73], 1935 (Heinrich 1936, Hopkins & Rotschild 1956), Pisanec, 2 ind. (from owl pellets) (Mitev 1995); – Rusčuk [= Ruse], Sv. Petka Peštera cave [74], April 1891, 1 ind. (Kovačev 1894); – Tabačka [75], 23 Oct. 1977: obs. flying inds (Undžijan 1998). – S i l i s t r a: Srebărna, Srebărna reserve [76], 1965–1966: 2 ind. (Genov 1969, Kojumdžieva 1971); – Tutrakan [77], cave (Kovačev 1906). – S l i v e n: Sliven [78], 23 May 1957: obs. (Hanák & Josifov 1959), 1970–1972: 2 ind. (from owl pellets) (Simeonov 1978). – S m o l j a n: Lăki, rocks in the valley bellow the town [79], 27 April 1985: 11 ind. (from owl pellets) (Obuch & Benda 1996); – Orehovo [80], 1958–1961 (Băčvarov 1963). – S o f i j a: Borovec [81], 1350 m, building, 4 August 1953 [1ma, 1fa, NMNHS] (Markov 1955a); – Iskrec, Dušnika cave [82], 1991–1998 (Pandurska & Beshkov 1998a); – Kazičene [40], 20 April 1939 [1fa, NMNHS 204] (Hanák & Josifov 1959), behind tree bark, 1 Nov. 1940: 13 ind. (Bureš 1941, 1942); – Kitjuklija [83] (from owl pellets) (Simeonov 1985); – Pančarevo, Pančarevski Bani [84], tree hollow, Summer 1955 (Kvartirnikov 1956, Beron 1958), 6 Oct. 1961 (Jančev & Stojkova 1973); – Sofija [42] (Beron 1968), 2 May 1955 [1fa; NMNHS] (Hanák & Josifov 1959), 7 Oct. 1963 (Beron & Kolebinova 1964), 4 May 1964 (Beron 1968), 25 March 1966 (Jančev & Stojkova 1973), 12 Nov. 1968 (Jančev & Stojkova 1973), 20 April 1969 (Beron 1973a), Gara Seminarija, tree hollow, 1 ind. (Kvartirnikov 1956), Parka Na Svobodata [= Borisovata Gradina], 26 Febr. 1970 (Jančev & Stojkova 1973), zoologičeska gradina, 27 July 1968 (Jančev & Stojkova 1973). – S t a r a Z a g o r a: Čirpan [85] (Grimmberger 1993). – Š u m e n: Izgrev [86], 1965–1967: 1 ind. (from owl pellets) (Simeonov 1978); – [Preslav], Patlejna reserve [87], 1973–1975 (from owl pellets) (Simeonov 1985). – T ă r g o v i š t e: Stevrek [88], June–July 1977 (from owl pellets) (Simeonov & Boev 1988). – V a r n a: Dolen Čiflik [89], tree holow, 10 May 1965: 3m, 1faL (Mateva & Hristov 1970); – Kamčija river [90], 30 June 1935 (Heinrich 1936, Hopkins & Rotschild 1956). – V e l i k o T ă r n o v o: Svištov [91], 2 August 1932: coll. 1ma [NMNHS 205] (Hanák & Josifov 1959). – V r a c a: Liljače, Božija Most cave [92] (Grimmberger 1993).

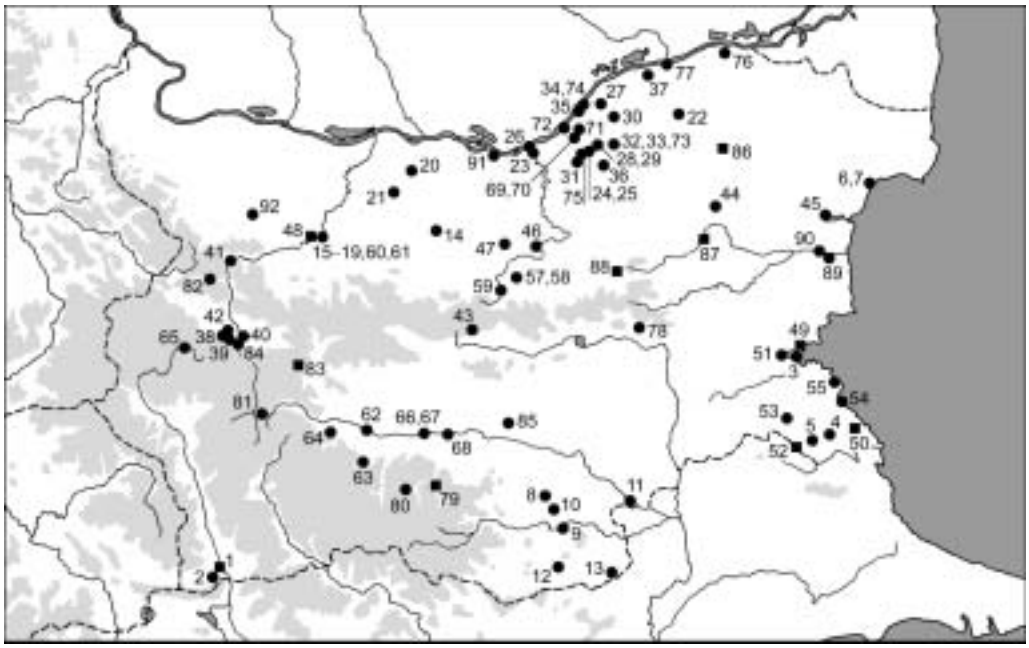

Fig. 22. Records of *Nyctalus noctula* (Schreber, 1774) in Bulgaria. Explanation of symbols as in Fig. 3. Numbers correspond with locality numbers in the text.

DISTRIBUTIONAL STATUS (Fig. 22). *N. noctula* is regularly distributed over most regions of Bulgaria. The higher concentrations of records in some regions seem to reflect rather a higher endeavour of researchers rather higher population densities of the species (Tab. 11). Almost all records come from the lowland and medium altitudes up to 500 m a. s. l., except for two at altitudes higher than 1000 m (1200 m a. s. l., Central Balkan Mts.; 1350 m a. s. l., Rila Mts.). The first group of data comprises foraging or migrating individuals and groups, records of mating calls and mating places, and skeletal remains in owl pellets. Our material of *N. noctula* in Bulgaria includes also large hibernating colonies in rock crevices at entrance parts of caves (Emenskata cave, Devetaškata cave, Răžiškata cave) and on buildings in cities (Sofia). Most summer records concern solitary individuals, colonies were found in two cases (May, August), but in only one of them a lactating female was captured (10 May, Dolen Čiflik near Varna; Mateva & Hristov 1970). No nursery colonies were discovered during the main period of reproduction in June and July, individuals of both sexes were found within the rest of a year except in March and September.

Several authors considered the Balkan Peninsula as that part of the distribution range of *N. noctula* where no nursery colonies were built but where subadult individuals could occur and adult males and females meet, copulate and hibernate (Strelkov 1997, 1999, 2000, Strelkov & Abramov 2001). Our data do not contradict that view and support it (e.g. by that a vast majority of records come just from spring, late summer and autumn period) in that it may concern prevailing part of the Bulgarian population of the species. Nevertheless, some noctules probably do nurse their youngs on the territory of Bulgaria and this smaller part of population perhaps can be labelled facultative migratory (sensu Gaisler & Hanák 1969) although *N. noctula* typically is a migratory species (cf. Strelkov 1969, 1971). The data obtained from other Balkan countries (Hanák 1964, Răduleț 1994b, Benda & Horáček 1998, Hanák et al. 2001) correspond well to this view thus modifying the above consideration in the following way: nursery colonies of *N. noctula* are rare yet existing in the Balkans. Anyway, Bulgarian territory is a part of the southern periphery of the species range. *N. noctula* was regularly recorded in northern Greece (Hanák et al. 2001), a few old records were known from southern Greece but they probably concerned vagrant individuals (Miller 1912). External and cranial dimensions of examined specimens of *N. noctula* from Bulgaria are shown in Tab. 9.

NOTE. Long migration of *N. noctula* from Russia to Bulgaria was evidenced by a record of a banded bat (Bureš & Beron 1962). Bulgarian authors erroneously gave 2347 km as the distance between the site of marking and that of recapture, the real distance (as the bee flies) was 1600 km (Panjutin 1968, 1980, Strelkov 1969, 1971). Even so, it is the maximum known distance of a movement in *N. noctula* recorded so far (Masing et al. 1999).

Nyctalus leisleri (Kuhl, 1817)

RECORDS. **Original data**: B l a g o e v g r a d: Gorna Breznica [1], over a brook, 19 July 1982: net. 1ma (NMP 50034 [S+B], cf. Petrov 2001). – B u r g a s: Černomorec [2], bird-box, 15 July 1987: obs. 1ma, 1ms; – Gramatikovo [3], over Veleka river, 23 August 1999: net. 1fa; – Kalovo [4], over Mladežka river, 27 August 1999: net. 1ma, 5fa. – L o v e č: Aprilci, Pleven hut [5], 14 August 1997: net. 1fa (cf. Ivanova 1998, Beron et al. 2000a); – Černi Osăm, Steneto reserve [6], Kumanica river, 800 m, 10 August 1997: net. 1ma (cf. Ivanova 1998, Beron et al. 2000a). – **Published data**: R u s e: Božičen [7], 1 ind. (from owl pellets) (Mitev 1995); – Svalenik [8], 1 ind. (from owl pellets) (Mitev 1995). – S o f i j a: Sofija [9], building, 3 April 1911(1912): 1f (Bureš 1917, Kovačev 1925), 19 Sept. 1955: 1m [NMNHS] (Hanák & Josifov 1959, Beron 1973a, 1974b). – V a r n a: Kamčija river [10], 28 July 1935: 3f (Heinrich 1936, Hopkins & Rotschild 1956); – Varna, Galata [11] (Kovačev 1908). – V e l i k o T ă r n o v o: Emen, Emenskata Peštera cave [12], summer 1984 (Ivanov 1985); – Svištov [13], 2 August 1932: 1ma [NMNHS 206; leg. F. Fus] (Hanák & Josifov 1959).

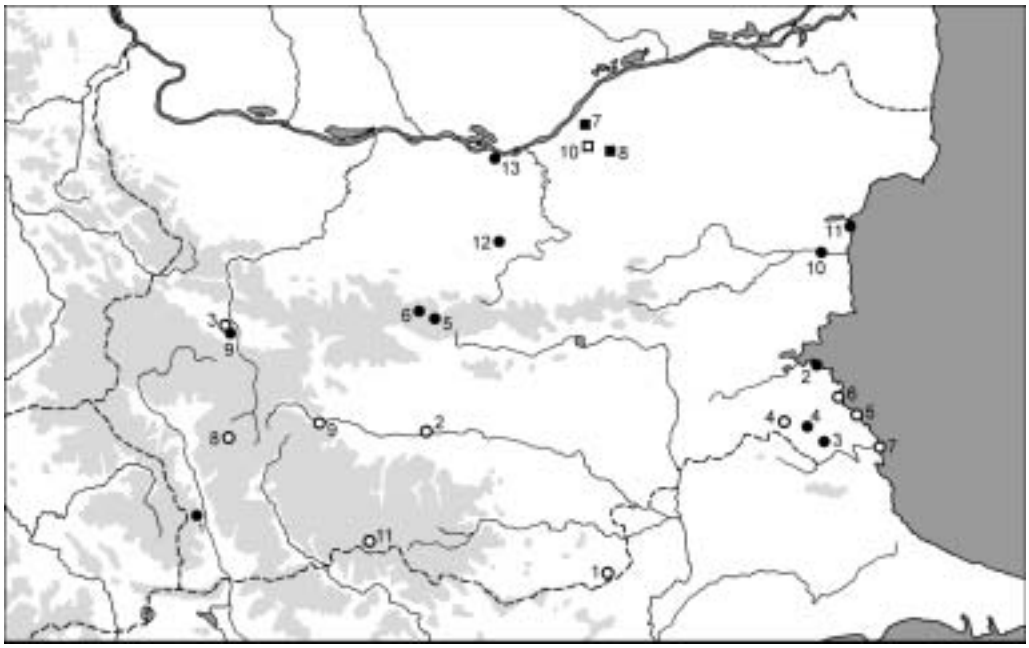

Fig. 23. Records of *Nyctalus leisleri* (Kuhl, 1817) (closed symbols) and *N. lasiopterus* (Schreber, 1780) (open symbols) in Bulgaria. Explanation of other symbols as in Fig. 3. Numbers correspond with locality numbers in the text.

Distributional status (Fig. 23). *N. leisleri* was recorded at lower elevations (0–800 m a. s. l.) over much of Bulgaria with one exception (Central Balkan Mts., 1500 m a. s. l.). There are only 13 localities where *N. leisleri* was found (Tab. 11) but this may have been due to the hidden way of its roosting. The data concern bats netted in woody valleys of lowland rivers and various occasional records such as of individuals in bird boxes, in buildings of towns or of skeletal remains in owl pellets. Very likely, in lowland forests the species is more common than recorded.

In contrast to the data available from Bulgaria, in Greece *N. leisleri* is clearly the most common of all species of the genus what is well illustrated by respective number of records: *N. leisleri* 28, *N. noctula* 10, *N. lasiopterus* 10 (Hanák et al. 2001). In Bulgaria, the corresponding numbers are as follows: 12, 92, 11 (Tab. 11), the ratio almost identical with the respective data from Romania: 7, 42, 2 (Rădulețț 1994b). Similar situation as in Bulgaria and Romania was found in Macedonia (Kryštufek et al. 1992) or Albania (Uhrin et al. 1996a). Exceptional concentration of *N. leisleri* in Greece can be documented by the fact that the number of Greek localities is nearly the same as the total number of localities in all other Balkan states lumped together (20:21; sensu Mirić & Paunović 1997).

N. leisleri is considered to be a migrating species (Strelkov 1969, 1971, Roer 1989, Fischer 1999) and the hitherto evidence suggests that most individuals recorded in the Balkans are transmigrants or immigrants (cf. Mirić & Paunović 1997, Hanák et al. 2001). Only in Bulgaria most records concerned females, in all other Balkan countries males prevailed in the samples. In late spring and early summer, i.e. at the time of existence of nursery colonies, only males were found. In spite of the common occurrence of the species in Greece, no nursery colonies were found there. The territory of Greece and perhaps also that of Albania, Macedonia and southern Bulgaria may represent the

target area of immigrants from the north. A population of males, perhaps also of some not reproducing females, may stay there during the vegetation season. The territory of all other Balkan countries situated more northwardly, according to that view, serves *N. leisleri* as a transmigration area. If this is true, the Balkan Peninsula represents that part of distribution area of *N. leisleri*, where only migrating or temporarily settled males and not reproducing females occur and no nursery colonies are built. This corresponds to the type of natural history typical of *Vespertilio murinus*, *Pipistrellus nathusii* and *Nyctalus noctula* after Strelkov (1997, 1999, 2000) and Strelkov & Abramov (2001). External and cranial dimensions of an examined specimen of *N. leisleri* from Bulgaria are shown in Tab. 8.

NOTE. Ivanov (1985) published a record of *N. leisleri* from the Emenskata cave, together with records of strictly cavernicolous species *Rhinolophus blasii* and *Myotis emarginatus*. Very likely however, the individual represented *Miniopterus schreibersii* instead and was misidentified (cf. Skuratowicz et al. 1982). There have been no other records of *N. leisleri* from Balkan caves.

Nyctalus lasiopterus (Schreber, 1780)

RECORDS. **Original data**: H a s k o v o: Meden Buk, over Bjala Reka river [1], 27 July 2002: net. 1m (cf. Buis & Ivanova 2002). – P l o v d i v: Plovdiv [2], Dec. 1924: coll. 1 ind. (leg. D. Georgiev). – S o f i j a: Sofija [3], 14 June 1933: coll. 1ma (NMNHS 203), park, 7 May 1997: coll. 1ma (NMNHS 105). – **Published data**: B u r g a s: Karamlek [= Karamlăk = Mladežko] [4], Strandjabalkan [= Strandža Mts.], 31 July 1935: 1 ind. (Heinrich 1936, cf. Theodor 1967); – Mičurin [= Carevo] [5], 14 Jan. 1954 (Martino 1955, cf. Beron 1973b); – Primorsko [6], 5 June 1957: obs. 1 ind. (Hanák & Josifov 1959); – Rezovo [7], 14 June 1933 [NMNHS] (Hanák & Josifov 1959). – K j u s t e n d i l: Rila-Gebirge, beim Rila-Kloster [= Rilski Manastir], 1100 m a. s. l [8], 29 May 1938: 1ma [ZFMK 39.22 (S+B), leg. A. v. Jordans] (Wolf 1940). – P a z a r d ž i k: Gara Belovo [9] [1909: 1ma; leg. J. Milde] (Bureš 1917, Kovačev 1925, Heinrich 1936). – R u s e: Tabačka [10], 1 ind. (from owl pellets) (Mitev 1995). – S m o l j a n: Bujnovska Reka river [11], 1250 m, 19 August 1995: net. 1 ind. (Pandurska & Beshkov 1998b).

DISTRIBUTIONAL STATUS (Fig. 23). This rare species has already been reported at the first half of the last century, then as the first records in the whole Balkan Peninsula (Bureš 1917, Heinrich 1936, Wolf 1940, Martino 1955, Hanák & Josifov 1959). *N. lasiopterus* occurs mainly in southern Bulgaria, probably all over that territory, only one record of a skeletal remain in an owl pellet comes from northern Bulgaria (Mitev 1995) (in total 11 localities; Tab. 11). The species was found in lowland floodplain or Mediterranean forests, records from higher elevations are exceptional (up to 1250 m a. s. l. in the Western Rhodopes Mts.).

The distribution and abundance of *N. lasiopterus* in Bulgaria is roughly the same as in Greece (Hanák et al. 2001) but, in addition to that, a nursery colony was found there (Wolf 1964). The species seems to be rare throughout the Balkans between Hungary and Bulgaria: from Romania come only two records from the Danubian Lowland (Valenciuc 1994, Răduleţ 1994b) and from other Balkan countries (with exception of Dalmatia) *N. lasiopterus* was never found yet (cf. Mitchell-Jones et al. 1999). Some cranial dimensions of an examined specimen of *N. lasiopterus* from Bulgaria are shown in Tab. 8.

Barbastella barbastellus (Schreber, 1774)

RECORDS. **Original data**: B l a g o e v g r a d: Bansko, Čalin Valog [1], rocky niche, 1160 m a. s. l., 9 August 2002: net. 1f; – Kresna [2], drainage channel, Dec. 1999: 1f (cf. Petrov 2001); – Ribnovo, Manuilovata Peštera cave [3], 10 Febr. 1998: obs. 1 ind., 22 June 2000: net. 1ma. – B u r g a s: Černomorec [4], gallery n. town, 16 July 1987: net. 1ma; – Malko Tărnovo, Goljamata Vitanovska Peštera cave [5], 6 Jan. 2000: obs. 1ma. – K ă r d ž a l i: Gugutka, Čukurska Reka river [6], 14 April 1998: net. 1fa. – K j u s t e n d i l: Rilski Manastir, Kravarski Dol, Iliina Reka river [7], gallery, 1000 m a. s. l., 23 August 2001: net. 3ma, 1fa (leg. N. Simov). – L o v e č: Aprilci, Pleven hut, Vodnite Dupki cave [8], 15 August 1997: net. 3ma (cf. Ivanova 1998, Beron et al.

2000a), 4 Febr. 2001: obs. 18 ind.; – Čiflik, Hajduška Pesen hut [9], gallery, 2 Nov. 1997: obs. 4ma (leg. P. Beron & V. Beškov, cf. Ivanova 1998, Beron et al. 2000a); – Goljama Željazna, Toplja cave [10], 19 Jan. 1992: obs. 1ma (leg. R. Pandurska), 2 Febr. 1997: obs. 1ma. – M o n t a n a: Gorna Bela Rečka, gallery [11], 12 Oct. 1996: net. 2ma, 26 Oct. 1997: net. 1ma (cf. Pandurska & Beshkov 1998a, Pandurska & Ivanova 2003). – P a z a r d ž i k: Peštera, Lilova Skala cave [12], 5 Febr. 1965: coll. 1ma (IVB 39 [S+B]). – P l e v e n: Žernov [13], crevice in the rocky cliffs, 15 June 2001: obs. 1 ind. (leg. C. Dietz). – S m o l j a n: Borino, Kastrakli reserve [14], over road, 11 August 2002: net. 1f; – Gela, Ledenica cave [15], 31 July 1971: net. 1ma (cf. Horáček et al. 1971, 1974). – S o f i j a: Lipnica, Kozarnika cave [16], 21 May 1997: net. 1ma (cf. Pandurska & Beshkov 1998a, Pandurska & Ivanova 2003). – S t a r a Z a g o r a: Tăža, Dždendema reserve [17], small caves, 29 August 1997: net. 1 ind. (leg. V. Beškov & R. Pandurska, cf. Ivanova 1998, Beron et al. 2000a). – **Published data**: L o v e č: Černi Osăm, Treta Bezimenna cave [18], 28 August 1960: coll. 1 subfossil ind. (Beškov & Beron 1962). – P a z a r d ž i k: Velingrad, Lepenica cave [19] (Jančev & Stojkova 1973), 17 Dec. 1961: obs. 1ma (Beškov & Beron 1962). – P l o v d i v: Plovdiv [20], 1958–1961: 1 ind. (Bačvarov 1963). – S o f i j a: Kostenec, Čavča river valley [21], 1200–1300 m a. s. l. (Beron et al. 2000b); – Želen, Mečata Dupka cave [22], 30 Jan. 1994 [1ma] (Beron 1994). – V a r n a: Kamčija river [23], 16 June 1935: 1f (Heinrich 1936), 19 June 1935: 1faG (Heinrich 1936), 2 July 1935: 1faG (Heinrich 1936).

DISTRIBUTIONAL STATUS (Fig. 24). Heinrich (1936) was the first who found *B. barbastellus* in Bulgaria. His record at the lower Kamčija River represents the only evidence of the reproduction of the species in Bulgaria so far, as well as one of two such records in the whole Balkan Peninsula (Paunović et al. 2003). There are, however, relatively numerous other records (23 localities; Tab. 11) scattered mainly in karstic and woody areas situated at elevations higher than 500 m a. s. l. (Balkan Mts., Rila Mts., Pirin Mts., Rhodopes Mts, Strandža Mts.), rarely in lowland river valeys. Altitudinal range of all records of *B. barbastellus* in Bulgaria is 30–1540 m a. s. l. (mean 780 m a. s. l.).

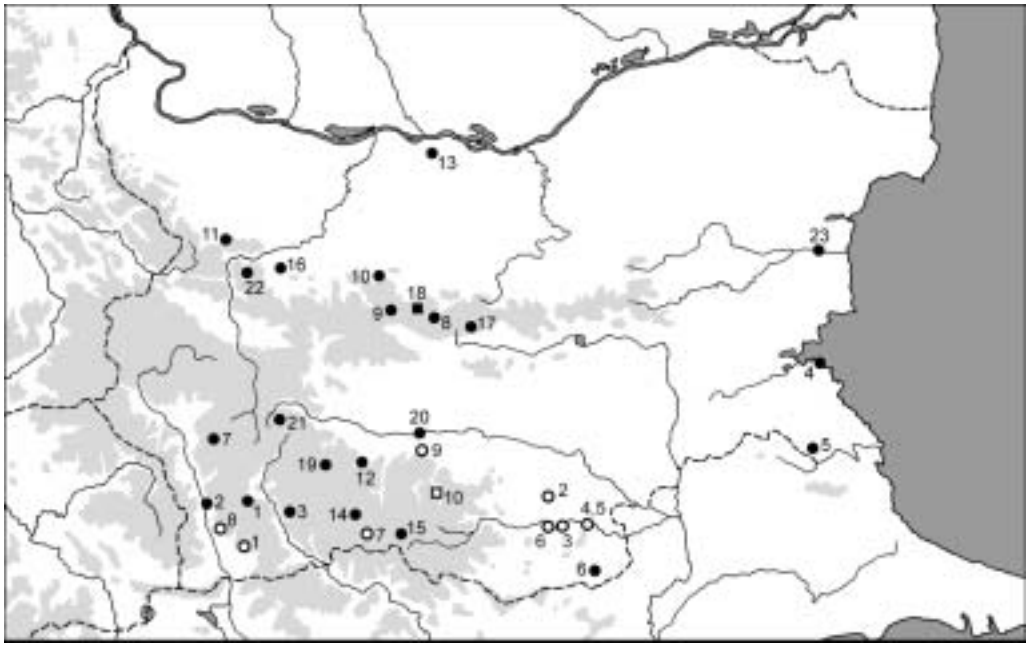

Fig. 24. Records of *Barbastella barbastellus* (Schreber, 1774) (closed symbols) and *Tadarida teniotis* (Rafinesque, 1814) (open symbols) in Bulgaria. Explanation of other symbols as in Fig. 3. Numbers correspond with locality numbers in the text.

Tab. 10. Basic biometric data for examined Bulgarian samples of *Plecotus auritus* (Linnaeus, 1758), *P. austriacus* (Fischer, 1829), and *Miniopterus schreibersii* (Kuhl, 1817). For abbreviations see p. 250

	Plecotus auritus					*Plecotus austriacus*					*Miniopterus schreibersii*				
	n	min	max	M	SD	n	min	max	M	SD	n	min	max	M	SD
LC	10	43.0	51.0	48.0	2.211	57	43.0	60.0	50.3	3.217	71	49.0	67.0	55.8	3.301
LCd	10	45.0	52.0	47.9	2.558	57	42.0	55.0	47.6	2.783	65	45.0	66.0	59.3	5.124
LAt	10	38.5	40.9	39.6	0.904	59	37.0	42.0	39.7	1.124	85	41.2	48.0	45.9	1.005
LA	10	33.0	39.3	35.5	1.770	57	33.0	40.7	37.2	1.339	63	10.0	14.0	11.7	1.043
LTr	10	15.0	18.0	16.7	0.944	56	14.0	19.0	17.5	1.171	60	5.0	8.0	6.4	0.786
G	10	6.0	9.0	7.5	0.909	53	6.5	11.0	8.3	1.060	76	10.0	18.0	13.5	1.975
LCr	12	15.69	16.53	16.27	0.244	66	16.52	18.13	17.32	0.338	66	14.52	15.75	15.16	0.252
LCb	12	14.62	15.40	15.11	0.240	65	15.49	16.86	16.21	0.294	67	14.00	15.17	14.69	0.231
LaZ	12	8.54	8.81	8.70	0.078	63	8.85	9.53	9.21	0.178	58	8.18	8.85	8.57	0.144
LaI	12	3.14	3.64	3.39	0.127	67	3.08	3.67	3.38	0.115	74	3.33	3.79	3.61	0.084
LaN	12	7.78	8.39	8.18	0.184	67	7.91	8.85	8.47	0.174	70	7.67	8.38	8.03	0.141
AN	12	5.08	5.44	5.24	0.116	65	4.89	5.81	5.37	0.169	69	5.92	6.51	6.29	0.112
LBT	11	4.04	3.82	4.28	0.122	65	4.67	4.38	4.84	0.097	–	–	–	–	–
CC	11	3.68	3.88	3.78	0.065	66	3.84	4.37	4.13	0.106	64	4.11	4.73	4.52	0.117
M^3M^3	12	5.82	6.27	6.12	0.129	66	6.08	6.82	6.46	0.156	67	5.36	6.62	6.33	0.183
CM^3	11	5.18	5.58	5.42	0.122	66	5.79	6.60	6.00	0.131	71	5.75	6.14	5.92	0.080
LMd	11	9.88	10.64	10.32	0.203	66	10.68	11.62	11.20	0.203	66	10.41	11.08	10.79	0.149
ACo	11	2.83	3.03	2.90	0.065	66	2.93	3.61	3.32	0.145	68	2.16	2.69	2.50	0.094
CM_3	11	5.61	6.24	5.85	0.176	66	6.20	6.73	6.45	0.116	66	6.13	6.48	6.32	0.077

Most records concern individuals found in underground spaces during hibernation or at the time of supposed migrations (Pandurska & Ivanova 2003). Such data cannot be used to estimate the occurrence in summer and/or reproduction. When compared with its status in central Europe, *B. barbastellus* is rare in Bulgaria and apparently of a discontinuous distribution confined to patches of woodland and cooler, mainly mountainous regions (Pandurska & Ivanova 2003). The situation is very similar in Greece (Hanák et al. 2001) as well as in Romania (Valenciuc 1994, Gheorghiu et al. 2001). The territory of the Balkan Peninsula obviously represents a relic part of the species distribution range in Europe (Paunović et al. 2003). External and cranial dimensions of an examined specimen of *B. barbastellus* from Bulgaria are shown in Tab. 8.

NOTE. Pandurska & Ivanova (2003) and Paunović et al. (2003) included into the data on distribution of *B. barbastellus* in the Balkans records reported by Horáček (1982). The respective Horáček's datum, however, concerns Pleistocene fossil and does not indicate the Recent distributional status of the species.

Plecotus auritus (Linnaeus, 1758)

RECORDS. **Original data**: B l a g o e v g r a d: Bansko, Vihrenskata Propast chasm [1], 30 August 1972: coll. 2 subfossil ind. (leg. P. Beron; cf. Benda & Ivanova 2003). – B u r g a s: Černomorec, gallery n. town [2], 16 July 1987: net. 1ma. – K j u s t e n d i l: Rilski Manastir, Kirilova Poljana [3], gallery, 18 Dec. 2002: coll. 1ms (NMP 50441 [S+A]; cf. Benda & Ivanova 2003); – Rilski Manastir, Ilijna Reka river [4], gallery, 1500 m a. s. l., 24 August 2001: net. 4fa, 2fj, 1mj (leg. N. Simov), 1000 m a. s. l., 5 July 2001: net. 4ma (leg. N. Simov). – P l o v d i v: Kalofer, Raj hut, Rogačevata cave [5], 18 August 1997: net. 1ma (NMNHS [S]; cf. Ivanova 1998, Beron et al. 2000a, Benda & Ivanova 2003); – Kărnare, Mazata cave [6], 25 Sept. 1997: net. 1ma (cf. Ivanova 1998, Beron et al. 2000a). – S l i v e n: Sliven [7], galleries, 12 August 1983: net. 1ma; – Tvărdica, Măglivjat Snjag cave [8], 26 Sept. 1996: net. 7ma, 1fa (cf. Ivanova 1998). – S m o l j a n: Čepelare, Samurski Dupki cave [9], 30 July 1971: net. 1ms (cf. Horáček et al. 1971, 1974); – Gela, Ledenica cave [10], 31 July 1971: net. 1ms, coll. 1 recent and 6 subrecent skeletons (cf. Horáček et al. 1971, 1974), 13 August 1978: net. 4ma, 1ms, 2fs

(NMP 49070, 49072–49077 [S+A]; cf. Hůrka 1984b, Hanák et al. 2001, Benda & Ivanova 2003); – Jagodina, Dolna Karanska Dupka cave [11], 16 August 1978: net. 1ma (NMP 49078 [S+A]; cf. Hanák et al. 2001, Benda & Ivanova 2003); – Jagodina, Imamova (= Jagodinskata) Dupka cave [12], 26 Oct. 2002: net. 2ma (leg. R. Lučan); – Orehovo, cave in a quarry [13], 25 August 1980: net. 1ma (NMP 49082 [S+A]; cf. Hanák et al. 2001, Benda & Ivanova 2003). – S o f i j a: Ginci, Dinevata Pešt cave [14], 22 Sept. 1991: net. 2ma (cf. Pandurska et al. 1999), 23 Jan. 1994: obs. 1ma; – Sofija [15], 1 August 1952: coll. 1 ind. (NMNHS; leg. I. Bureš). – S t a r a Z a g o r a: Tăža, Dždendema reserve, Bezimenna cave [16], 29 August 1997: net. 3 ind. (leg. V. Beškov & R. Pandurska, cf. Ivanova 1998, Beron et al. 2000a); – Tăža, Dždendema reserve, small caves [17], 29 August 1997: net. 9 ind. (leg. V. Beškov & R. Pandurska, cf. Ivanova 1998, Beron et al. 2000a). – **Published data**: B l a g o e v g r a d: Leško, cave [18], 4–5 Oct. 1995: net. 1 ind. (Pandurska & Beshkov 1998b). – P a z a r d ž i k: Peštera, Lilova cave [19], 15 August 1985: 1m (Grimmberger 1993). – S m o l j a n: Stojkite, Pamporovo [20] [21 August 1958: coll. 1 ind., NMNHS] (Beron 1964a). – S o f i j a: Borovec [21], 1350 m, 25 July 1926 (Markov 1955a), building, 11 June 1932 [1fj, NMNHS 208] (Hanák & Josifov 1959), 3 ind. (Beron 1959, 1964a); – Bov, Izdrimec peak [22], gallery, 1991–1998 (Pandurska & Beshkov 1998a); – Breze, Travninata cave [23], 1991–1998 (Pandurska & Beshkov 1998a); – Buhovo, Murgaš peak [24], building, 1991–1998 (Pandurska & Beshkov 1998a); – Ginci, Dinevata Pešt cave [14], nettings 1990–1994: 4 ind. (Pandurska et al. 1999), 1991–1998 (Pandurska & Beshkov 1998a); – Ginci, four caves [25], winter census 1991–1994: 2 ind. (Pandurska et al. 1999); – Kokaljane, Urvič [26], gallery No. 6, 20 Dec. 1968 (Beron 1970); – Komštica, Goljama Balabanova cave [27], 1991–1998 (Pandurska & Beshkov 1998a); – Sitnjakovo (Rila Mts.) [28], 1916–1918: 1 ind. (Boetticher 1925, cf. Beron 1964a).

DISTRIBUTIONAL STATUS (Fig. 25). *P. auritus* was recorded in 28 Bulgarian localities (Tab. 11). According to that data, the species is distributed in wooded, cool and higher elevated regions of central and south-western Bulgaria (Balkan Mts., Vitoša Mts., Pirin Mts., Rila Mts., Rhodopes Mts.; Benda & Ivanova 2003). One locality is beyond that picture (Černomorec near Burgas, ca. 30 m

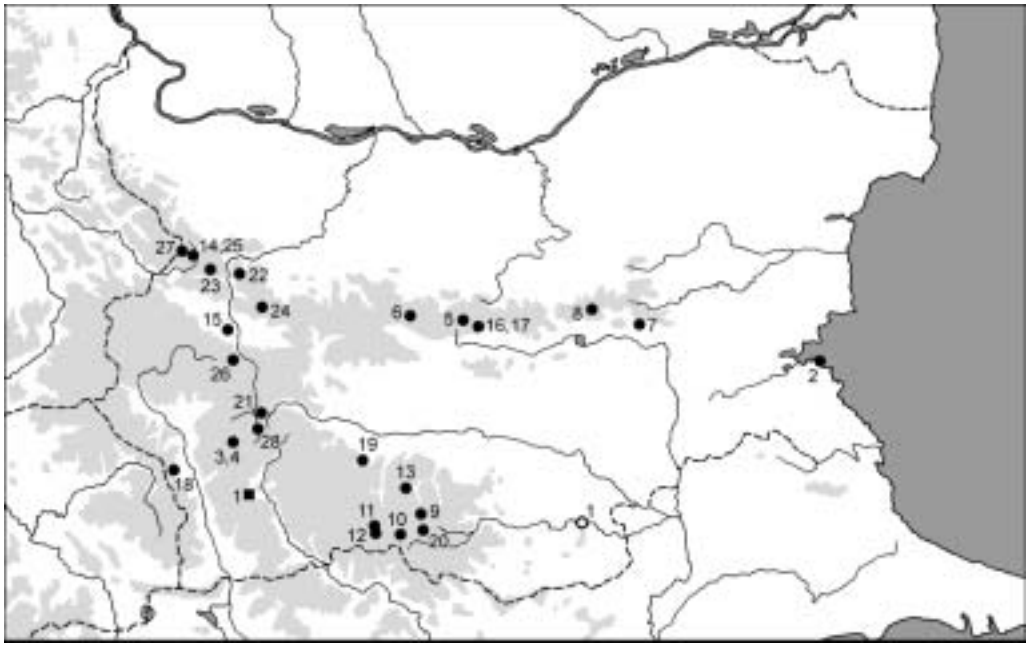

Fig. 25. Records of *Plecotus auritus* (Linnaeus, 1758) (closed symbols) and *Pipistrellus pygmaeus* (Leach, 1825) (open symbol) in Bulgaria. Explanation of symbols as in Fig. 3. Numbers correspond with locality numbers in the text.

a. s. l.) but it is situated close to the mountain massif of the Strandža Mts., from the other (Turkish) side of which *P. auritus* was recorded (Benda & Horáček 1998). The total altitudinal span of Bulgarian localities is 30–2500 m a. s. l., 79% of them, however, are situated at the elevations higher than 1000 m and the average elevation of all localities is 1175 m a. s. l. Out of the localities situated under 1000 m a. s. l., six are within woody habitats or close to them.

In conclusion, *P. auritus* is relatively strictly restricted to mountain ranges in Bulgaria, in the same way as in Greece where at least six records were reported (Hanák et al. 2001). The situation reminds that of *B. barbastellus* (Fig. 24) but *P. auritus* is even more confined to cool regions and high elevations. When compared to the more common *P. austriacus*, *P. auritus* is both limited geographically and exhibits low population densities – the number of its records amounts to only 15% of the number of records of long-eared bats in Bulgaria (Benda & Ivanova 2003). In respect to the distribution range of *P. auritus*, the Balkan Peninsula represents evidently a peripheral relic part characterized by markedly discontinuous distribution pattern. External and cranial dimensions of examined specimens of *P. auritus* from Bulgaria are shown in Tab. 10.

Plecotus austriacus (Fischer, 1829)

Records. **Original data**: B l a g o e v g r a d: General Todorov, Pčelina hill [1], gallery, 4 August 1994: net. 2ms (NMP 49132, 49133 [S+A]; cf. Hanák et al. 2001, Benda & Ivanova 2003), 11 August 1994: net. 1ma, 1ms, 1fa (NMP 49134–49136 [S+A]; cf. Hanák et al. 2001, Benda & Ivanova 2003), 23 July 1995: net. 1m (leg. J. Sádlová); – Gorna Breznica, theatre [2], 16 July 1981: net. 2ma (NMP 49084, 49085 [S+B]; cf. Hanák et al. 2001, Benda & Ivanova 2003), 20 July 1981: net. 1m (NMP 49086 [S+B]; cf. Hanák et al. 2001, Benda & Ivanova 2003); – Kresna, Gara Pejo Javorov [3], building, 7 July 1990: obs. 1 ind.; – Ploski, cave [4], 3 July 1986: net. 2ms, 30 July 1994: net. 1ma (NMP 49130 [S+A]; cf. Hanák et al. 2001, Benda & Ivanova 2003), 31 July 1994: net. 1ma (NMP 49131 [S+A]; cf. Hanák et al. 2001, Benda & Ivanova 2003); – Ploski, Zandana cave [5], 12 April 1996: coll. 1ma (NMNHS); – Rožen, Roženski monastery [6], 9 August 1994: obs. 1ma; – Vlahi [7], building, 16 Dec. 1990: obs. 2 ind. – B u r g a s: Černomorec, Nos Atija cape [8], abri, 12 July 1987: 1m; – Grudovo [9], gallery, 11 July 1982: net. 1ma; – Primorsko, Maslen Nos cape [10], 17 August 1999: net. 1fj. – D o b r i č: Albena, sea shore, river mouth [11], 21 August 1983: net. 1ma; – Kamen Brjag [12], 9 July 1987: net. 1ma (NMP 50056 [S+B]; leg. M. Šálek; cf. Benda & Ivanova 2003); – Kavarna, cave near sea [13], 11 Sept. 1962: 1ma, 2fa, 1fs (IVB 39–41 [S+B]; cf. Gaisler & Hanák 1964, Hanák et al. 2001, Benda & Ivanova 2003); – Sveti Nikola, Tauk Liman [14], small cave, 5 April 1994: coll. 1 subfossil ind. (NMNHS [S]; cf. Benda & Ivanova 2003); – Tjulenovo [15], cave, 17 August 1983: net. 1ma. – H a s k o v o: Gaberovo, Gjurgen Dere [16], cave, 7 Oct. 1998: net. 3ma, 1fa; – Madžarovo, gallery [17], 11 May 1996: net. 1ma, 9 Dec. 2000: obs. 1ma; – Madžarovo, rocky cliffs [18], 28 Oct. 2002: net. 2ma (NMP 90132, 90133[S+A]; leg. R. Lučan). – K ă r d ž a l i: Momčilgrad [19], water pool, 18 June 1977: net. 1fa (NMP 49066 [S+A]; cf. Hanák et al. 2001, Benda & Ivanova 2003); – Orešari, Karangin cave [20], 20 Oct. 1995: net. 7ma (cf. Ivanova 1997), 17 Sept. 1996: net. 6ma, 1fa (cf. Ivanova 1997); – Ribino, Samara cave [21], 2 Jan. 1997: obs. 2 ind.; – Stremci [22], gallery, 7 Febr. 1998: obs. 1ma. – L o v e č: Aprilci, Pleven hut, Vodnite Dupki cave [23], 15 August 1997: net. 1ma, 1fa (cf. Ivanova 1998, Beron et al. 2000a); – Gložene [24], coll. 1fa (NMNHS [S]; leg. P. Beron, cf. Benda & Ivanova 2003); – Karlukovo, Bankovica cave [25], 3 Oct. 1962: coll. 1ma (IVB 42 [S+B]; cf. Gaisler & Hanák 1964, Hanák et al. 2001, Benda & Ivanova 2003), 7 Febr. 1965: obs. 2ms, 2fa (IVB 73 [S+B]; NMP 49052–49054 [S]; cf. Hanák et al. 2001, Benda & Ivanova 2003); – Karlukovo, cave behind monastery [26], 8 August 1978: net. 1ma (NMP 49069 [S]; cf. Hanák et al. 2001, Benda & Ivanova 2003), 9 August 1978: net. 3ma; – Karlukovo, cave near Prohodna cave [27], 7 Febr. 1965: 1fa (IVB 74 [S+B]; cf. Hanák et al. 2001, Benda & Ivanova 2003), 9 August 1978: net. 4ma; – Karlukovo, ridge above rocky amphitheatre [28], 12 June 1977: net. 1ma (NMP 49064 [S+A]; cf. Hanák et al. 2001, Benda & Ivanova 2003), 15 June 1977: net. 1ma (NMP 49065 [S+A]; cf. Hanák et al. 2001, Benda & Ivanova 2003); – Karlukovo, Prohodna cave [29], 7 August 1978: net. 3ma (NMP 49067, 49068, 49071 [S+A]; cf. Hanák et al. 2001, Benda & Ivanova 2003); – Karlukovo, Temnata Dupka cave [30], 5 July 1975: net. 1ma (NMP 50235 [S+A]; cf. Kučera 1979, Benda & Ivanova 2003); – Karlukovo, Zadănenka cave (Zadănen Dol) [31], 20 May 2000: net. 1ma; – Zlatna Panega, Gornata Peštera cave [32], July 1948: coll. 1ma (NMNHS 210; cf. Beron 1962); – Zlatna Panega, Panežka Izvora cave [33], 8 Febr. 1965: obs. 3 ind., coll. 1fa (IVB 75 [S+B]; cf. Hanák et al. 2001, Benda & Ivanova 2003). – M o n t a n a: Gorna Bela Rečka [34], gallery, 12 Oct. 1996: net. 1 ind. (leg. R. Pandurska, cf. Pandurska & Beshkov 1998a). – P a z a r d ž i k:

Velingrad, Suhata Peštera cave (near Lepenica quarry) [35], 27 June 2000: net. 1ma. – P e r n i k: Pernik [36], coll. 1 ind. (NMNHS 075 [S]; cf. Benda & Ivanova 2003). – P l e v e n: Muselievo, abandoned building [37], 10 June 2001: net. 2ma, 3fa, obs. nurs. colony; – Muselievo, niche in the rocks [38], 9 June 2001: net. 3ma. – R a z g r a d: Suševo [39], building, 15 Nov. 1995: obs. 1 ind. – R u s e: Krasen, Găbarnika cave [40], 22 Jan. 2000: obs. 1ma. – S i l i s t r a: Vojnovo, Malkata Badžalija cave [41], 16 April 1999: net. 3fa, 5 Oct. 1999: net. 3ma,, 19 April 2001: net. 1 ind. – S l i v e n: Sliven [42], 10 June 1982: net. 1ma (NMP 40922 [S+A]; cf. Hanák et al. 2001, Benda & Ivanova 2003). – S m o l j a n: Jagodina, Dolna Karanska Dupka cave [43], 16 August 1978: net. 1ma (NMP 49079 [S+A]; cf. Hanák et al. 2001, Benda & Ivanova 2003); – Mogilica, Uhlovica cave [44], 20 July 1996: net. 2ma; – Orehovo, cave 100 m W [45], 25 August 1980: net. 1ma (NMP 49083 [S+A]; cf. Hanák et al. 2001, Benda & Ivanova 2003), 28 June 1984: net. 3ma (NMP 49087–49089 [S+A]; leg. T. Scholz & D. Král, cf. Hanák et al. 2001, Benda & Ivanova 2003), 29 June 1984: net. 1ma (NMP 49090 [S+A]; leg. T. Scholz & D. Král, cf. Hanák et al. 2001, Benda & Ivanova 2003); – Orehovo, cave in a quarry [46], 24 August 1980: net. 2ma (NMP 49080, 49081 [S+A]; cf. Hanák et al. 2001, Benda & Ivanova 2003). – S o f i j a: Berende Izvor, Temnata Dupka cave [47], 2 March 1991: obs. 1 ind.; – Buhovo, Murgaš hut [48], 3 August 1994: net. 1fa (cf. Ivanova 1998); – Ihtiman, 1916: coll. 1 ind. (NMNHS; leg. P. Petkov); – Iskrec, Dušnika cave [49], 10 Febr. 1965: coll. 1ma (cf. Hůrka 1965); – Kostinbrod [50], 21 March 1967: coll. 1fa (NMNHS [S]; leg. P. Beron; cf. Jančev & Stojkova 1973, Benda & Ivanova 2003); – Lakatnik [51], 6 Jan. 1951: 1ma (NMNHS; leg. V. Martino, cf. Gaisler & Hanák 1964); – Lakatnik, Gornata Peštera cave [52], 18 March 1956: 1ma (NMP 49051 [S]; leg. M. Josifov, cf. Beron 1962, Gaisler & Hanák 1964, Hanák et al. 2001, Benda & Ivanova 2003); – Lakatnik, Răžiškata (= Suhata) Peštera cave [53], 21 Dec. 1956: 1 ind. (NMP 50145 [B]; leg. V. Beškov, cf. Hanák & Josifov 1959, Benda & Ivanova 2003), 10 Febr. 1965: obs. 4ms, 3fa, 1fs (NMP 49055–49063 [S+B]; cf. Hůrka 1965, Hanák et al. 2001, Benda & Ivanova 2003), 16 Dec. 2002: coll. 1ms (NMP 50438 [S+A]; cf. Benda & Ivanova 2003); – Lakatnik, Svinskata Dupka cave [54], 24 August 1995: net. 1ma (NMNHS), 16 Dec. 2002: coll. 1fa (NMP 50440 [S+A]; cf. Benda & Ivanova 2003); – Lakatnik, Temnata Dupka cave [55], 3 Jan. 1962: obs. 2fa (leg. J. Sklenář; cf. Dusbábek 1964a, b, Gaisler & Hanák 1964, Hůrka 1965), 10 Febr. 1965: 1ma, 1ms, 2fa (NMP 50103 [S], IVB 76–78 [S+B]; cf. Hůrka 1965, Hanák et al. 2001, Benda & Ivanova 2003), 9 July 1982: net. 3ms, 16 Dec. 2002: coll. 1fa, 1fs (NMP 50436, 50437 [S+A]; cf. Benda & Ivanova 2003); – Lipnica, Kozarnika cave [56], 21 May 1997: net. 2 ind. (leg. R. Pandurska); – Sofija [57], 18 Jan. 1933: coll. 1fa (NMNHS; leg. L. Lukaš), 16 Febr. 1954: 22m (ZIN; leg. Pešev), 1ma (NMNHS; leg. A. Mutafčijski), 27 April 1963: coll. 1ma (NMNHS [S]; leg. P. Beron, cf. Benda & Ivanova 2003). – Š u m e n: Šumen, Zandana cave [58], 23 Jan. 2000: obs. 1 ind. (cf. Ivanova 2001). – T ă r g o v i š t e: Omurtag [59], 1920: coll. 1 ind. (NMNHS; leg. D. Jordanov). – V a r n a: Komunari [60], a rocky fissure in the valley, 12 July 1979: obs. 2fa, 1mj, 1fj; – Varna [61], 28 July 1954: 1 ind. (ZIN). – **Published data**: B l a g o e v g r a d: Leško [62], cave, 4–5 Oct. 1995: net. 3 ind. (Pandurska & Beshkov 1998b); – Ploski, rocky crevice [63], 6 June 1990 (Pandurska & Beshkov 1998b). – B u r g a s: Sosopel [= Sozopol] [64], 8 May 1938: 1f [ZFMK 39.21 (S+B)] (Wolf 1940 [as *P. auritus*], cf. Beron 1964a, Benda & Ivanova 2003). – D o b r i č: Dobrudža [*65*], undefined, June–July 1952 (Markov 1955b, Markov & Hristov 1960 [as *P. auritus*]). – K j u s t e n d i l: Lileč [= Liljač] [66] (Kovačev 1925 [as *P. auritus*], cf. Beron 1964a). – L o v e č: [Gradežnica], Malkata Peštera cave [67], 9 Sept. 1956: 1 ind. (Beron 1958 [as *P. auritus*], cf. Beron 1964a); – Karlukovo, Ovnarkata cave [68], 26 Sept. 1959 (Beron 1962 [as *P. auritus*], cf. Beron 1964a); – Karlukovo, Zadănen Dol near Prohodna cave [69], summer 1988: 6 ind. (Popov & Ivanova 1995), summer 1989: 7 ind. (Popov & Ivanova 1995), summer 1990: 4 ind. (Popov & Ivanova 1995), summer 1991: 7 ind. (Popov & Ivanova 1995), autumn 1991: 4 ind. (Popov & Ivanova 1995), spring 1992: 2 ind. (Popov & Ivanova 1995), summer 1992: 2 ind. (Popov & Ivanova 1995). – M o n t a n a: Gorna Luka, Peč cave [70], 1991–1998 (Pandurska & Beshkov 1998a). – P e r n i k: Studena [71], gallery, 8 Febr. 1995: obs. 1m (Pandurska & Beshkov 1998b). – P l e v e n: Reselec, Temnata Dupka cave [72], 29 Dec. 1963 (Kolebinova & Beron 1965). – P l o v d i v: Peruštica [73], rocky gate, 28 April 1985: 1 ind. (from owl pellets) (Obuch & Benda 1996). – R u s e: Obrazcov Čiflik [74] (Kovačev 1906, 1925 [as *P. auritus*], cf. Beron 1964a); – Ruse [75] (Beron 1964a), town, 30 July 1962 (Undžijan 1998), 15 May 1969: 1 ind. (Undžijan 1998), 13 June 1972: 1 ind. (Undžijan 1998). – S o f i j a: Beledie Han, building [76], 28 August 1955: 1 ind. (Beron 1959, 1964a); – Beledie Han, Kolibata cave [77] (Beron 1959, 1962 [as *P. auritus*], cf. Beron 1964a), 1991–1998 (Pandurska & Beshkov 1998a); – Beledie Han, Komina cave [78], 20 Nov. 1955: 1 ind. (Beron 1959 [as *P. auritus*], cf. Beron 1964a); – Breze, Travninata cave [79], 1991–1998 (Pandurska & Beshkov 1998a); – Ginci, Dinevata Pešt cave [80] (Beron 1959 [as *P. auritus*], cf. Beron 1964a), nettings 1991–1994: 6 ind. (Pandurska et al. 1999), 1991–1998 (Pandurska & Beshkov 1998a); – Ginci, Krivata Pešt cave [81], 1991–1998 (Pandurska & Beshkov 1998a); – Ginci, four caves [82], winters 1991–1994: 3 ind. (Pandurska et al. 1999); – Golema Rakovica [83], 2 ind. (Beron 1958 [as *P. auritus*]), gallery, 20 April 1958 (Beron 1958 [as *P. auritus*], cf. Beron 1964a); – Kokaljane, Urvič [84], galleries, 8 Febr. 1958: 1f (Beron 1958, 1959, 1963 [as *P. auritus*], cf. Beron 1964a), 24 Jan. 1961: 1m (Beron 1963), 25 Nov. 1961: 1f (Beron 1963 [as *P. auritus*]), 26 Nov. 1961 (Jančev & Stojkova 1973), 17 Febr. 1962: 1f (Beron 1963

[as *P. auritus*]), 18 March 1962: 1m, 1f (Beron 1963 [as *P. auritus*]), Nov. 1963 (Kolebinova & Beron 1965); – Komštica, Goljama Balabanova cave [85], 1991–1998 (Pandurska & Beshkov 1998a); – Lakatnik, cave [86], 4 Nov. 1961 (Jančev & Stojkova 1973); – Lakatnik, Kozarskata Peštera cave [87], 4 Jan. 1957 (Beron 1962 [as *P. auritus*], cf. Beron 1964a); – Lakatnik, Răžiška Dupka cave [53] (Beron 1973a, cf. Dusbábek 1964a [as *P. auritus*], Beron 1964a), 31 Dec. 1957: 1f (Beron 1959, 1963 [as *P. auritus*], 1964a), 20 Dec. 1958: 1f (Beron 1959, 1963 [as *P. auritus*], 1964a), 8 Dec. 1968 (Beron 1970), 1991–1998 (Pandurska & Beshkov 1998a); – Lakatnik, Svinskata Dupka cave [54], 5 Nov. 1961: 1m (Beron 1963 [as *P. auritus*]), 4 March 1962: 1m (Beron 1963 [as *P. auritus*]), 10 March 1963 (Beron & Guéorguiev 1967), 1991–1998 (Pandurska & Beshkov 1998a); – Lakatnik, Sedmovratica cave [88], 18 March 1956 (Beron 1962 [as *P. auritus*], cf. Beron 1964a); – Lakatnik, Temnata Dupka cave [55] (Beron 1959 [as *P. auritus*], cf. Beron 1964a), 24 April 1964 (Kolebinova & Beron 1965), 15 Jan. 1966: 2 ind. (Hůrka 1970); – Lakatnik, Vraži Dupki cave [89] (Beron 1959 [as *P. auritus*], cf. Beron 1964a); – Lakatnik, Zigankata cave [90], 2 Jan. 1957 (Beron 1962 [as *P. auritus*], cf. Beron 1964a); – Lipnica, Boženiški Urvič cave [91], 1991–1998 (Pandurska & Beshkov 1998a); – Lipnica, Kozarnika cave [56], 1991–1998 (Pandurska & Beshkov 1998a); – Pančarevo [92] (Beron 1959 [as *P. auritus*]); – Sofija [57], 12 July 1927: coll. 1ma [NMNHS 209; leg. P. Drenski] (Hanák & Josifov 1959 [as *P. auritus*], cf. Beron 1964a), 20 Dec. 1927: coll. 1fa [NMNHS 212; leg. I. Bureš] (Hanák & Josifov 1959 [as *P. auritus*]), 19 Febr. 1954 (Martino 1955 [as *P. auritus*]), 4 June 1967 (Jančev & Stojkova 1973), 8 June 1967 (Beron 1968); – Sofija, Lovnija park [93] (Beron 1959 [as *P. auritus*], Beron 1964a); – Svoge [94], gallery, 16 March 1958: 4 ind. (Beron 1958 [as *P. auritus*], cf. Beron 1964a). – V a r n a: Varna, Evksinograd [95], 15 Sept. 1925 [coll. 1fa, 1 ind., NMNHS 043-6] (Hanák & Josifov 1959 [as *P. auritus*], cf. Beron 1964a), 20 August 1935 [1mj, NMNHS 043-7] (Hanák & Josifov 1959 [as *P. auritus*], cf. Beron 1964a). – V i d i n: Dolni Lom, Desni Suhi Peč cave [96], 1991–1998 (Pandurska & Beshkov 1998a). – V r a c a: Elisejna, Četvărtitata cave [97], 1991–1998 (Pandurska & Beshkov 1998a); – Gabare, Starata Prodănka cave [98], 3 March 1968 [1f, NMNHS (S)] (Beron 1970, Benda & Ivanova 2003); – Kunino, Vasilica cave [99], 25 June 1929: coll. 1fa [NMNHS 211; leg. L. Bozero] (Hanák & Josifov 1959 [as *P. auritus*], cf. Beron 1964a); – Vraca, Rezn'ovete cave [100] (Beron & Guéorguiev 1967). – Bulgaria undef.: Dubroviška cave [*101*], 1985: 1f (Belcheva et al. 1992), Bulgaria, without exact locality and date, 4 ind. [NMNHS (S)] (Benda & Ivanova 2003).

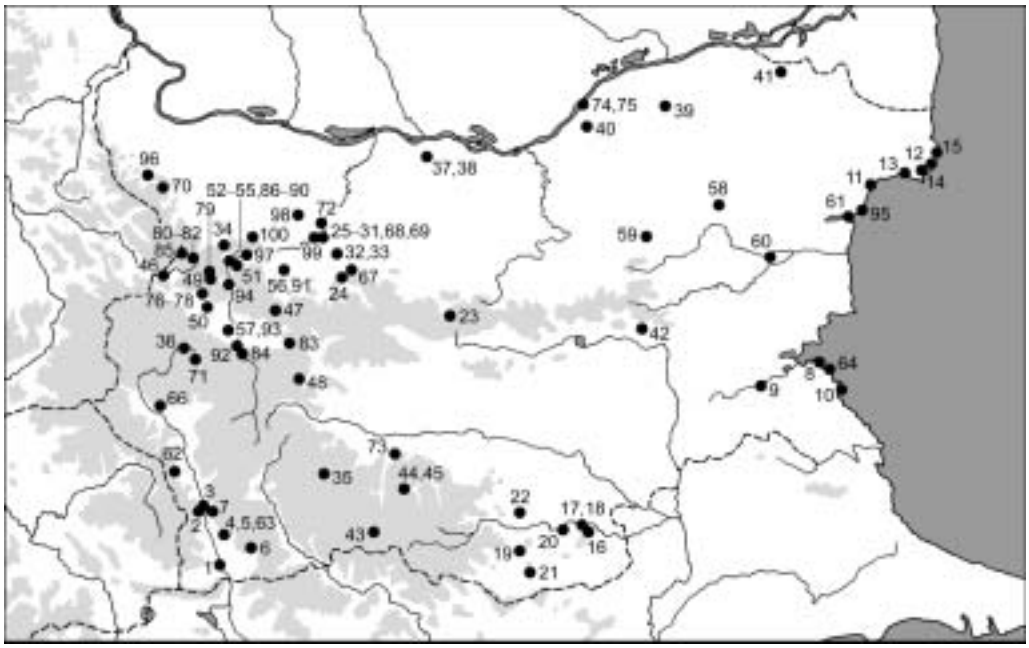

Fig. 26. Records of *Plecotus austriacus* (Fischer, 1829) in Bulgaria. Numbers correspond with locality numbers in the text.

DISTRIBUTIONAL STATUS (Fig. 26). Although *P. austriacus* was for the first time identified in Bulgaria in 1960s (Beron 1964a, Gaisler & Hanák 1964), it most probably was found earlier but reported in older publications under the name *P. auritus*, as can be inferred from the information available at present. This concerns the records mentioned e. g. by Bureš (1917, 1925), Kovačev (1906, 1925), Wolf (1940), Markov (1955b), Hanák & Josifov (1959), Markov & Hristov (1960), Beron (1958, 1959, 1962, 1963), etc., see Beron (1964a) and Benda & Ivanova (2003).

Till present, 101 Bulgarian localities have been known where the presence of *P. austriacus* was more or less sure (Tab. 11). The species inhabits the whole territory of the country except high mountains and, when compared to *P. auritus*, it is much more abundant (Benda & Ivanova 2003). The concentration of data in certain karstic and woody regions in western and southern Bulgaria (mainly in the Western Balkan Mts.), as well as on the Black Sea coast, is probably due to the intense research work there. The two *Plecotus* species differ in their ecology (Benda & Ivanova 2003): *P. austriacus* is a species of low altitudes, occuring at elevations exceeding 1000 m a. s. l. only exceptionaly (only in 15% of records), the highest record was made at 1500 m a. s. l. (mean altitude is 465 m a. s. l.); *P. auritus* is nearly exclusively a mountain species which only exceptionally descends to lower altitudes (see above). External and cranial dimensions of examined specimens of *P. austriacus* from Bulgaria are shown in Tab. 10.

NOTE. According to the morphometric analysis of the whole available material (skulls and skins) made by Benda & Ivanova (2003), no other *Plecotus* species was documented in Bulgaria. This concerns the two species other than *P. auritus* and *P. austriacus* known from the continental Europe, viz., *P. kolombatovici* and *P. macrobullaris* (Kiefer & Veith 2002, Kiefer et al. 2002, Spitzenberger et al. 2001, 2002, 2003). The latter two species, however, were found in the Balkans recently, their occurrence in Bulgaria, thefore, cannot be excluded (for details see Benda & Ivanova 2003).

Miniopterus schreibersii (Kuhl, 1817)

RECORDS. **Original data**: B l a g o e v g r a d: Ribnovo, Manuilovata Peštera cave, 14 Febr. 1998: obs. 5 ind., 22 June 2000: net. 2ma, 1fa. – B u r g a s: Černomorec, gallery n. town, 16 July 1987: net. 3m; – Kosti, Maharata cave, 8 Jan. 2000: obs. 1 ind.; – Mladežko, Lejarnicite cave, 11 July 1958: coll. 1ma (NMP 50203 [A]; leg. K. Hůrka; cf. Hůrka 1962), 25 August 1999: net. 2fa; – Primorsko, Maslen Nos cape, cave, 5 June 1957: obs. large colony, coll. 9ma, 11fa, 1mj, 1 ind. (NMP 49186, 49191, 49192, 49198, 49205–49207, 49214, 49220, 49222, 49226–49229, 49231, 49232, 49341 [S+A], 49197 [S], 50198, 50199, 50201, 50202 [A]; cf. Hůrka 1958, Hanák & Josifov 1959), 27 August 1961: coll. 5ms, 6fa, 6fs, 1 ind. (NMP 49686–49703 [S+B]); – Primorsko, Maslen Nos cape, Tjulenovata Peštera cave, 23 August 1997: obs. colony of ca. 1000 ind., 16 July 1998: obs. nurs. colony of ca. 3000 ind.; – Primorsko, Perla, abandoned building, 29 August 2000: obs. 300 ind.; – Ropotamo, 6 June 1957: obs. 1 ind. (cf. Hanák & Josifov 1959). – D o b r i č: Bălgarevo, Tjulenovata Peštera cave, 14 August 2003: obs. nursery colony of ca. 1000 ind.; – Kamen Brjag, cave 1 km NE of the town, 12 July 1986: net. 2fa (NMP 50049, 50050 [S+A]; cf. Hůrka 1997); – Tjulenovo, cave, 17 August 1983: net. 1ma, 1ms, 1fa, 2fs. – G a b r o v o: Armenite, Černata Peštera cave, 26 July 1998: obs. 2ma, 1fa; – Drjanovo, Andăka cave, 6 April 1991: obs. ca. 1000 ind., 15 April 1996: obs. ca. 2000 ind., 31 Jan. 1998: obs. 60 ind., 22 Febr. 1998: obs. ca. 1500 ind., 27 July 1998: obs. ca. 300 ind., 20 Jan. 2000: obs. 130 ind.; – Jantra, Izvora cave, 22 March 1991: obs. 3 ind.; – Jantra, Prilepnata Peštera cave, 24 June 1995: obs. ca. 300 ind., 27 July 1998: obs. nurs. colony of ca. 2600 ind. – H a s k o v o: Bjal Kladanec, Goljama Peštera cave, 3 March 1999: obs. 1 ind.; – Madžarovo, gallery, 12 May 1996: net. 1ma, 16 May 1998: net. 1ma, 30 Sept. 2003: obs. 2m (leg. R. Lučan). – J a m b o l: Lesovo, gallery, 1 April 1991: coll. 10 ind. (NMNHS, leg. P. Stoev); – Melnica, Vodnata Drănči Dupka cave, 30 June 2000: obs. ca. 500 ind.; – Ustrem, Bozkite cave, 10 April 1998: net. 10 ind. – K ă r d ž a l i: Orešari, Karingin cave, 20 Oct. 1995: net. 1ma, 1fa (cf. Ivanova 1997), 27 April 1996: net. 2ma, 13fa (cf. Ivanova 1997), 29 April 1997: obs. (cf. Ivanova 1997), 14 July 1997: obs. (cf. Ivanova 1997), 17 May 1998: obs. ca. 500 ind., 17 June 1998: obs. nurs. colony of ca. 500 ind., 20 July 1998: net. 30 ind., obs. nurs. colony, 11 April 1999: obs. 370 ind., 10 June 1999: obs. 800 ind., 3 July 1999: obs. nurs. colony of ca. 500 ind., 17 June 2000: obs. nurs. colony of ca. 300 ind.; – Ribino, Samara cave, 1 April 1995: obs. ca. 100 ind. (leg. P. Beron, cf. Ivanova 1997), 20 April 1995: net. 2 ind. (cf. Ivanova 1997), 11 Oct. 1995: obs. 5 ind. (cf. Ivanova 1997), 12 June 1996:

obs. 3 ind. (cf. Ivanova 1997), 21 Sept. 1996: obs. 1 ind. (cf. Ivanova 1997), net. 1ma, 4 March 1999: obs. 90 ind., 21 Sept. 2001: obs. 400 ind., 29 Sept. 2002: obs. ca. 500 ind.; – Ribino, Aina Ini cave, 11 Oct. 1995: obs. 100 ind. (cf. Ivanova 1997), 22 Oct. 1995: obs. (cf. Ivanova 1997), 1 May 1996: obs. ca. 500 ind. (cf. Ivanova 1997), 11 June 1996: trap. 6ma, 14fa (cf. Ivanova 1997), 14 July 1997: obs. 1000 ind. (cf. Ivanova 1997), 18 Nov. 1997: obs. 200 ind. (cf. Ivanova 1997), 18 May 1998: obs. 100 ind., 22 July 1998: trap. 500 ind., 11 Oct. 1998: trap. 350 ind., 4 March 1999: obs. 100 ind., 4 July 1999: obs. nurs. colony of ca. 1000 ind., 18 June 2000: obs. nurs. colony of ca. 600 ind., 11 Sept. 2000: obs. ca. 500 ind., 9 Sept. 2001: obs. 300 ind., 15 Sept. 2001: net. 2ma, 29 Sept. 2002: obs. 2 ind.; – Visoka Poljana, Jarasă-Ini cave, 31 March 1992: obs. 10 ind. (cf. Ivanova 1997), 11 July 1995: obs. 1000 ind. (cf. Ivanova 1997), 12 August 1995: obs. 100 ind. (cf. Ivanova 1997), 19 Oct. 1995: net. 250 ind. (cf. Ivanova 1997), 6 May 1996: obs. 950 ind. (cf. Ivanova 1997), 18 Sept. 1996: obs. 300 ind. (cf. Ivanova 1997), 28 April 1997: obs. 1000 ind. (cf. Ivanova 1997), 15 July 1997: obs. nurs. colony of ca. 5000 ind. (cf. Ivanova 1997), 17 May 1998. obs. 700 ind., 23 July 1998: obs. nurs. colony of ca. 5000 ind., 13 Oct. 1998. obs. 10 ind., 5 July 1999: obs. nurs. colony of ca. 9000 ind., 20 June 2000: obs. nurs. colony of ca. 1500 ind. – K j u s t e n d i l: Gorna Koznica, Asandelija cave, 9 Febr. 1994: coll. 2 subfossil ind.; – Osogovska Mt., 11 Febr. 1935: coll. 1ma (NMNHS 197; leg. I. Bureš); – Vetren, Goljamata Peštera cave, 3 Jan. 1999: obs. 40 ind. – L o v e č: Aprilci, Vodnite Dupki cave, 15 August 1997: net. 3ma, 3mj, 1fa (cf. Ivanova 1998, Beron et al. 2000a), 24 May 1999: obs. 15ma, 3fa; – Bežanovo, Parnicite cave, 12 May 1990: obs. ca. 1500 ind., 11 Nov. 1990: obs. ca. 8000 ind., 14 Dec. 1990: obs. ca. 12,000 ind., 16 April 1994: obs. colony of ca. 3000 ind., 21 Jan. 1995: obs. ca. 10,000 ind. 20 Jan. 1996: obs. ca. 5000 ind., 28 Jan. 1998: obs. ca. 23,000 ind., 15 May 1998: obs. ca. 750 ind., 5 Dec. 1999: obs. ca. 65,000 ind., 26 May 2000: obs. ca. 1500 ind., 13 Jan 2002: obs. ca. 52,000 ind.; – Čavdarci, Mandrata cave, 24 Sept. 2000: obs. ca. 100 ind., 3 June 2000: obs., 7 June 2001: obs. 500 ind.; – Devetaki, Devetaškata Peštera cave, 13 August 1994: obs. nurs. colony of ca. 2000 ind. (cf. Beron 1994), 2 Jan. 1996: obs. ca. 1000 ind., 1 Febr. 1997: obs. ca. 5000 ind., 23 March 1997: obs. ca. 17,000 ind., 24 Febr. 1998: obs. ca. 5000 ind., 30 July 1998: obs. nurs. colony of ca. 6000 ind., 11 Sept. 1998: obs. ca. 4000 ind., 20 May 1999: net. 23ma, 13fa (leg. C. Dietz), 7 Nov. 1999: obs. 10 ind., 19 Jan. 2000: obs. ca. 15,000 ind., 4 June 2000: obs. ca. 1000 ind., 14 July 2000: obs. nurs. colony of ca. 60,000 ind., 24 Sept. 2000: obs. ca. 1000 ind., 7 June 2001: obs. ca. 1000 ind., 25 June 2001: obs. nurs. colony of ca. 10,000 ind., 12 Jan. 2002: obs. ca. 25,000 ind.; – Dragana, Skoka cave, 8 April 1995: obs. ca. 1000 ind., 22 March 1997: obs. 20 ind.; – Gložene, Ljastovicata cave, 21 Febr. 1998: obs. 1 ind., 11 April 1999: obs. ca. 2000 ind. (leg. S. Tanev), 30 April 1999: net. 5ma, 23fa, obs. nurs. colony of ca. 2000 ind., 23 April 2000: obs. ca. 600 ind.; – Gložene, Morovica cave, 18 April 1993: obs. ca. 300 ind., 1 May 1994: obs. ca. 500 ind., 25 Febr. 1998: obs. ca. 1200 ind.; – Goljama Željazna, Toplja cave, 26 April 1991: obs. 60 ind.; – Karlukovo, cave, 23 June 1937: coll. 1ma, 1fa (NMNHS 191, 192; leg. I. Bureš); – Karlukovo, cave behind monastery, 8 August 1978: net. 6m, 6f, 2mj, 3fj, 9 August 1978: net. 1m, 2fj; – Karlukovo, small cave near Prohodna, 9 August 1978: net. 1ma, 1j, 1fa, 2fj, 2 ind.; – Karlukovo, ridge above rocky amphitheatre, 3 July 1976: net. 1fa (NMP 49351 [S]; cf. Kučera 1979, Hůrka 1984a, b), 5 July 1976: net. 1ms, 3faL (NMP 49356, 49357, 49361, 49362 [S+A]; cf. Kučera 1979, Hůrka 1984a, b), 6 July 1976: net. 1fa (NMP 49367 [S+A]; cf. Kučera 1979, Hůrka 1984a, b); – Karlukovo, ridge of a rocky amphitheatre, 8 August 1978: net. 2 ind.; – Karlukovo, Čerdženica cave, 6 July 1975: net. 2ma, 5fa (NMP 50238–50244 [A]; cf. Kučera 1979), 8 July 1975: net. 1ma, 1fs; – Karlukovo, Troevratica cave, 11 August 1999: obs. ca. 16,000 ind., 22 April 2000: obs. ca. 10,000 ind., 21 May 2000: obs. nurs. colony of ca. 3000 ind.; – Krušuna, Uruška Maara cave, 21 May 1994: net. 3ma, 2fa, 30 July 1998: obs. nurs. colony of ca. 4500 ind., 18 May 1999: obs. ca. 1000 ind. (leg. N. Simov), 3 June 2000: obs. nurs. colony of ca. 6000 ind., 7 June 2001: obs. nurs. colony of ca. 50 ind.; – Mikre, Goljamata Mikrenska Peštera cave, 15 July 2000: obs. 10 ind., 6 Sept. 2000: obs. ca. 400 ind.; – Mikre, Malkata Mikrenska Peštera cave, 25 April 1991: obs. 20 ind. – M o n t a n a: Gorna Bela Rečka, gallery, 26 Oct. 1997: net. 1 ind. (leg. R. Pandurska); – Gorna Luka, Mišin Kamăk cave, 20 Febr. 1998: obs. 30 ind. (cf. Pandurska & Beshkov 1998a), 19 July 2000: obs. 500 ind.; – Gorna Luka, Vodni Peč cave, 25 Febr. 2000: obs. 1 ind., 19 July 2000: obs. nurs. colony of ca. 3000 ind.; – Mitrovci, Goljamata Mitrovska Peštera cave, 18 July 2000: 1 ind. – P a z a r d ž i k: Gabrovica, Golaškata Peštera mine, 12 Oct. 1988: obs. ca. 4500 ind., 24 Dec. 1989: obs. ca. 1000 ind., 26 June 1990: obs. nurs. colony of ca. 1000 ind., 15 Nov. 1990: obs. ca. 1000 ind., 17 Oct. 1993: obs. ca. 500 ind., 17 Dec. 1994: obs. ca. 200 ind., 23 Jan. 1997: obs. ca. 350 ind., 23 Jan. 1998: obs. ca. 850 ind., 7 June 1998: obs. nurs. colony of ca. 9000 ind., 11 Dec. 1998: obs. ca. 1800 ind., coll. 1fa (NMNHS 155), 20 Febr. 2000: obs. ca. 700 ind., 10 June 2000: obs. nurs. colony of ca. 11,000 ind., 27 Jan. 2002: obs. 600 ind.; – Peštera, Ušatovi Dupki cave, 8 August 1967: obs 4 ind., coll. 2ma (IVB 45, 46 [S+B]); – Velingrad, Suhata Peštera cave (near Lepenica quarry), 5 June 2000: obs. 1ma, 27 June 2000: net. 6ma. – P l e v e n: Devenci, Hajduškata Peštera cave, 7 July 1975: net. 1ma, 3fa (NMP 50258–5261 [A]), 14 June 1977: net. 2fa, 1fs (NMP 49647–49649 [S+A]), 10 Dec. 1990: obs. 120 ind., 10 May 1997: obs. ca. 1000 ind. (cf. Pandurska 2003), 4 Dec. 1999: obs. 6 ind.; – Muselievo, cave No. 419, 30 May 2001: obs. ca. 1000 ind., 20 Oct. 2002: obs. 5 ind. (leg. I. Borissov); – Muselievo, Nanin Kamăk cave, 2 June

1990: obs. ca. 3000 ind., 10 Nov. 1990: obs. ca. 200 ind., 10 May 1997: obs. 20 ind.; – Rakita, Sedlarkata cave, 14 April 1991: obs. 1500 ind., 22 March 1997: obs. 700 ind., 29 Jan. 1998: obs. 4 ind., 14 May 1998: net. 5ma, 14fa, obs. colony of ca. 200 ind., 4 Dec. 1999: obs. 3 ind., 18 July 2001: net. 1ma. – P l o v d i v: Dobrostan, Marciganica, Ivanova Voda cave, 23 July 1979: obs. colony, net. 1ma (NMP 49806 [S+A]), 20 May 1998: obs. ca. 200 ind., 24 July 1998: net. 11ma, 1fa, 27 June 2000: net. 1ma; – Mostovo, Gargina Dupka cave, 22 June 1984: obs. large colony, net. 4ma, 5fa (coll. 1ma, NMP 50040 [S+A]; leg. T. Scholz & D. Král), 22 August 1987: net. 2ma, 3fa (NMP 50058–50062 [S+A]), 31 Jan. 1989: obs. ca. 10,000 ind. (cf. Beškov 1993, Beshkov 1998), 4 August 1995: net. 24ma, 5fa (leg. P. Munclinger), 7 Febr. 1998, obs. ca. 600 ind., 21 Febr. 1997: obs. ca. 1000 ind., 21 May 1998: obs. 200 ind., 25 July 1998: obs. colony of ca. 1000 ind., 29 Dec. 1999: obs. 280 ind., 29 June 2000: obs. ca. 1000 ind. – R a z g r a d: Seslav, Kaca Peštera cave, 12 April 2000: obs. 1fa. – R u s e: Červen, Zorovica cave, 23 Sept. 2002: obs. ca. 50 ind.; – Krasen, Găbarnika cave, 8 April 1991: obs. ca. 3500 ind., 30 June 1996: obs. nurs. colony of ca. 1000 ind., 29 Jan. 1998: obs. 7 ind., 28 July 1998: obs. nurs. colony of ca. 1000 ind., 2 Oct. 1999: obs. ca. 1000 ind. (incl. mating), 22 Jan. 2000: obs. 4 ind., 13 June 2000: obs. ca. 1000 ind. – S i l i s t r a: Onogur, Ergele Peštera cave, 20 April 2001: net. 2ma, 1fa; – Rujno, Ajazmoto cave, 15 April 1999: obs. 4 ind.; – Vojnovo, Malkata Badžalija cave, 16 April 1999: net. 1ma, 5fa, 5 Oct. 1999: net. 1ma, 19 April 2001: net. 3ma, 1fa. – S l i v e n: Kotel, Nirica Peštera cave (8 km W of the town), 15 July 1979: obs. colony of ca. 500 ind., net. 3ma, 20fa, 1fs, 1j (coll. 1fs, NMP 49799 [S+A]); – Kotel, Nirica cave, abri, 15 July 1979: net. 1ms (NMP 49798 [S+A]); – Kotel, Subatta cave, 5 July 2000: obs. colony of ca. 1000 ind.; – Kotel, Zelenič, Orlovata Peštera cave, 4 May 1980: obs. nurs. colony, exam. 1ma, 19fa (leg. V. Vasilev), 4 July 2000: obs. nurs. colony of ca. 3000 ind.; – Kotel, Zlosten, Lednicata cave, 26 Febr. 1997: obs. ca. 300 ind., 5 July 2000: obs. nurs. colony of ca. 4000 ind.; – Sliven, 10 June 1982: coll. 1fa (NMP 40926 [S]), 19 June 1982: coll. 1fa (NMP 40925 [S+B]); – Sliven, galleries, 12 August 1983: net. 1ma, 13 August 1983: net 1ma, 1fa; – Sliven, Zmejovi Dupki cave, 25 May 1957: obs. large colony, coll. 4fa, 4ms, 4fs (NMP 49148, 49165, 49166, 49177–49181 [S+A], 49150–49152, 49162 [S+B], 501912 [A]; cf. Hůrka 1958, Hanák & Josifov 1959, Dusbábek 1964a). – S m o l j a n: Orehovo, cave 100 m W of the village, 28 June 1984: net. 3ma (leg. T. Scholz & D. Král); – Orehovo, cave in a quarry, 24 August 1980: net. 1ma; – Trigrad, Djavolskoto Gărlo cave, 4 Nov. 1989: obs. ca. 7000 ind., 29 Jan. 1995: obs. ca. 11,000 ind., 23 June 1996: net. 8ma, 2fa, 13 Febr. 1998: obs. ca. 27,000 ind., 21 Sept. 1998: obs. ca. 300 ind., 27 Dec. 1999: obs. 40,800 ind., 29 June 2000: net. 18ma, 2fa, 14 Sept. 2000: obs. ca. 1000 ind., 2 Dec. 2000: obs. ca. 12,000 ind. – S o f i j a: Berende Izvor, Temnata Dupka cave, 2 March 1991: obs. 2ma; – Ginci, Dinevata Pešt cave, 11 Sept. 1979: obs. 24ma, 8fa (leg. V. Vassilev), 30 Sept. 1990: obs. ca. 1300 ind., 22 Sept. 1991: net. 2ma, 4fa (cf. Pandurska et al. 1999), 11 Oct. 1997: obs. ca. 500 ind.; – Kokaljane, Urvič, gallery, 22 Oct. 1956: coll. 1ma, 1 ind. (NMNHS, cf. Beron 1961); – Lakatnik, cave, 2 March 1951: coll. 1fa (NMNHS, leg. J. Gorelov), 12 April 1953: coll. 2ma (NMNHS, leg. V. Martino); – Lakatnik, Răžiškata (= Suhata) Peštera cave, 21 March 1956: coll. 1 ind. (NMP 50143 [S+B]; cf. Hanák & Josifov 1959), 10 Febr. 1965: coll. 1ma, 1fs (IVB 19, 41 [S+B]; cf. Sklenář 1969, Hůrka 1984a); – Lakatnik, Svinskata Dupka cave, 16 Dec. 2002: coll. 1 ind. (NMNHS); – Lakatnik, Temnata Dupka cave, 22 March 1925: coll. 1fa (NMNHS 033-4; cf. Hanák & Josifov 1959), 30 March 1930: coll. 1ma, 1fa (NMNHS 193, 194; leg. K. Tuleškov); – Lipnica, Kozarnika cave, 1 May 1995: obs. 1 ind. – Š u m e n: Divdjadovo, Zandana cave (Divdjadovski), 29 June 1995: obs. nurs. colony of ca. 1000 ind. (cf. Ivanova 2001), 4 Oct. 1996: obs. ca. 600 ind. (cf. Ivanova 2001), 30 June 2000: obs. nurs. colony of ca. 3000 ind. (cf. Ivanova 2001); – Madara, Hiljadite Očički cave, 28 June 1995: obs. nurs. colony of ca. 100 ind. (cf. Ivanova 2001), 4 Oct. 1996: obs. ca. 400 ind. (cf. Ivanova 2001), 1 July 2000: obs. nurs. colony of ca. 5000 ind. (cf. Ivanova 2001); – Stanjanci, small cave, 14 April 1990: obs. 6ma; – Šumen, Zandana cave, 29 Sept. 1996: obs. ca. 400 ind. (cf. Ivanova 2001), 23 Jan. 2000: obs. ca. 900 ind. (cf. Ivanova 2001), 29 June 2000: obs. colony of ca. 1000 ind. (cf. Ivanova 2001), 10 Sept. 2000: obs. ca. 200 ind. – T ă r g o v i š t e: Prolaz, Derventskata Peštera cave, 14 Jan. 1991: obs. 3 ind.; – Tărgovište, Marina Dupka cave, 3 July 2000: obs. nurs. colony of ca. 5000 ind. (cf. Ivanova 2001). – V a r n a: Beloslav, Temnata Dupka cave, 9 Sept. 1962: coll. 1ma (IVB 12 [S+B]), 4 Sept. 1966: 1fa (NMP 40691 [S+B]; leg. B. Pražan); – Varna, Evksinograd, 7 Oct. 1926: coll. 1ma (NMNHS 195; leg. I. Bureš); – Varna, Geberdženska Peštera cave, 25 Sept. 1936: coll. 1ma (NMNHS 033-2; leg. I. Conkov). – V e l i k o T ă r n o v o: Emen, Emenskata Peštera cave, 22 Oct. 1989: obs. ca. 200 ind., 23 Nov. 1990: obs. 20 ind., 29 April 1995: obs. ca. 500 ind., 13 April 1996: obs. ca. 1000 ind., 21 Febr. 1998: obs. ca. 150 ind., 15 May 1998: obs. ca. 200 ind., 27 July 1998: obs., 25 May 1999: obs. ca. 1000 ind., 23 Sept. 2000: obs. ca. 600 ind.; – Musina, Musinskata Peštera cave, 26 Nov. 1990: obs. 1 ind.; – Svištov, 28 June 1932: coll. 1fa (NMNHS 196; leg. F. Fus). – V i d i n: Car Petrovo, Vărkan cave, 27 Febr. 2000: obs. 1ma, 27 July 2000: obs. ca. 50 ind.; – Gorni Lom, Desni Suhi Peč cave, 19 July 2000: obs. 35 ind.; – Orešec, Peč cave (Suhi Peč), 20 Febr. 1998: obs. ca. 1000 ind. (leg. R. Pandurska), 20 July 2000: obs. nurs. colony of ca. 5000 ind.; – Vărtop, Prileparnika cave, 23 Febr. 1995: obs. 1 ind. – V r a c a: Beli Izvor, Kalna Mătnica cave (Toškova Dupka), 12 June 1994: obs., 22 August 1998: obs. ca. 200 ind. (leg. N. Simov), 11 Dec. 1999: obs. ca. 100 ind., 22 July 2000: obs. nurs. colony of ca. 5000 ind.; – Čiren, Ponora cave, 24 March

1991: obs. 15 ind., 22 April 1995: obs. ca. 1000 ind., 3 March 1997: obs. 10 ind., 27 Jan. 1998: obs. 1 ind., 27 July 2000: obs. 150 ind.; – Kalen, Kalenskata Peštera cave, 8 March 1998: obs. 530 ind., 22 April 2000: obs. ca. 650 ind.; – Kunino, Čeloveča Dupka cave (Čeloveči Dol), 1 May 1993: obs. 2fa, 26 Nov. 1994: obs. 1 ind., 4 April 1995: obs. ca. 1500 ind., 22 July 1995: obs. ca. 500 ind., 9 Nov. 1998: obs. ca. 1000 ind. (leg. N. Simov), 11 August 1999: obs. ca. 300 ind., 22 April 2000: obs. ca. 600 ind.; – Liljače, Tigančeto cave, 15 August 1963: coll. 2fa (NMNHS; leg. P. Beron); – Ljutibrod, Gara Čerepiš, Propastite cave, 4 Dec. 1924: coll. 1 ind. (NMNHS; leg. N. Radev); – Ljutibrod, Gara Čerepiš, Serapionovata Peštera cave, 24 Nov. 1988: obs. ca. 1500 ind. (cf. Pandurska 2003), 28 Nov. 1990: obs. 2 ind., 1 June 1991: obs. ca. 150 ind., 26 March 1998: obs. ca. 1000 ind. (cf. Pandurska 2003), 10 Jan. 1999: obs. 1 ind. – **Published data**: B l a g o e v g r a d: Osikovo, Manajlovata Peštera cave [= Ribnovo, Manuilovata Peštera], 14 May 1959 (Beron 1962, cf. Beškov 1993, Beshkov 1998), Oct. 1988: ca. 1200 ind. (Beškov 1993, Beshkov 1998), Oct. 1989: several thousands ind. (Beshkov 1998). – B u r g a s: Mladežko, Kaleto cave, June 1989: colony of 600–650 ind. (Beškov 1993, cf. Beshkov 1998); – Primorsko, Maslen Nos cape, cave, 2000 ind. (Kvartirnikov 1956), 1958 (Drenski 1961); – Primorsko, Maslen Nos cape, Južnata Podmolna Peštera cave, Oct. 1989: ca. 3000 ind. (Beškov 1993, Beshkov 1998); – Primorsko, Maslen Nos cape, Severnata Abrazionna Peštera cave, 11 August 1957 (Beron 1958, 1962); – Rezovo, cave, 20 Oct. 1968: 5 ind. (Kojumdžieva 1973, Kolebinova 1979); – Strandjabalkan [= Strandža Mts.], cave, 1935: 31m, 2f [= Mladežko, cave, 2 August 1935: 2ma, NMNHS; type series of *Miniopterus schreibersii inexpectatus* Heinrich, 1936] (Heinrich 1936, Feiler 1999); – Strandža Planina Mts., 1959 (Paspalev & Markov 1961). – D o b r i č: Dobrudža, undefined (Markov & Hristov 1960). – G a b r o v o: Drenovo [= Drjanovo], Golema Vodna Peštera cave [= Andăka], 21–24 May 1924: many ind. (Bureš 1926); – Drjanovo, Bačo Kiro cave, net. (Grimmberger 1993); – Gabrovo, 8 April 1960: 1 ind. (Beron 1963). – J a m b o l: Melnica, Suhata Drănči Dupka cave, August 1970: several tens ind. (Beškov 1993, Beshkov 1998); – Melnica, Vodnata Drănči Dupka cave, August 1970: 1200–4000 ind. (Beškov 1993, Beshkov 1998), March 1971: 1200–4000 ind. (Beškov 1993, Beshkov 1998), Nov. 1989: 1200–4000 ind. (Beškov 1993, Beshkov 1998); – Ustrem, Bozkite cave, Oct. 1988: colony of ca. 500 ind. (Beškov 1993, Beshkov 1998). – K ă r d ž a l i: Ivajlovgrad, Dupkata cave, 22 March 1975: 5m, 1f (Nowosad et al. 1987), 26 March 1976: 1m, 3f (Nowosad et al. 1987); – Visoka Poljana, Jarasă-Ini cave, April 1989 (Beškov 1993, Beshkov 1998). – K j u s t e n d i l: Kjustendil, gymnasium (Kovačev 1925); – Vetren, Goljamata cave, 8–9 June 1996: obs. colony of hundreds of bats (Pandurska & Beshkov 1998b). – L o v e č: Bežanovo, Parnicite cave, colony of 3000–4000 ind. (Beron 1964b), 17 Febr. 1963 (Jančev & Stojkova 1973), May 1990 – Sept. 1991: colony of ca. 2000 ind. (Pandurska 1998), two visits in summer season: 550–600 ind. and ca. 800 ind. resp. (Beškov 1993, Beshkov 1998), winter visit: ca. 4000 ind. (Beškov 1993, Beshkov 1998); – Čavdarci, Mandrata cave, July 1988: 2000–3000 ind. (Beškov 1993, Beshkov 1998); – Devetaki, Devetaškata Peštera cave, 16 August 1994 (Beron 1994), Sept. 1989: 2000–3000 ind. (Beškov 1993, Beshkov 1998), 4 June 1994: 2000f (Pandurska 1998), 1998: 11,000 ind. (Pandurska 1999, 2003), May–June 1997: colony of ca. 5000 ind. (Pandurska & Paunović 1997); – Gložene, Ljastovicata cave, 300–400 ind. (Beškov 1993, Beshkov 1998); – Gložene, Morovica cave, net. (Beškov 1993, Beshkov 1998); – Goljama Željazna, Toplja cave, Oct. 1989: ca. 3000 ind. (Beškov 1993, Beshkov 1998, cf. Pandurska 2003); – Gradešnik, cave [= Gradežnica, Gradežniškata (= Rušovata) Peštera], 9 August 1987: colony of ca. 600 ind. (Grimmberger 1993); – Karlukovo, Ovnarkata cave (Beron & Guéorguiev 1967); – Karlukovo, Troevratica cave, 26 Sept. 1960: over 1000 ind. (Beron 1962, 1964b), summer 1992: 71 ind. (Popov & Ivanova 1995), spring 1993: 2 ind. (Popov & Ivanova 1995); – Karlukovo, Zadănen Dol near Prohodna cave, summer 1988: 1 ind. (Popov & Ivanova 1995), summer 1989: 7 ind. (Popov & Ivanova 1995), summer 1991: 1 ind. (Popov & Ivanova 1995), autumn 1991: 2 ind. (Popov & Ivanova 1995), summer 1992: 4 ind. (Popov & Ivanova 1995); – Kărpačevo, Fut'ovskata Peštera cave, 26 August 1959 (Beron 1962, 1964b), colony of several hundreds ind. (Beškov 1993, Beshkov 1998); – Krušuna, Uruška Maara cave, 1958–1966: 2000–6000 ind. (Beškov 1993, Beshkov 1998), 24 June 1959: large colony (Beron 1961, cf. Beron 1964b), 25 August 1959 (Beron 1962), 11 Sept. 1960: 1f (Beron 1963), August 1988: ca. 3000 ind. (Beškov 1993), March 1989: 20–30 ind. (Beškov 1993, Beshkov 1998); – Krušuna, Vodopada cave, 10 Sept. 1960 (Beron 1962); – Loveč, Bašbunar park, Kjuljuka cave, 25 July 1959 (Beron 1962); – Mikre, Golemata Peštera cave, 27 Jan. 1960: 3 ind. (Beron 1962, 1963); – Zlatna Panega, Dolnata Peštera cave, 28 Febr. 1960 (Beron 1961, 1962). – M o n t a n a: Čerkaski, Grimnena Dupka cave, 29 Oct. 1971 (Beron 1972); – Gorna Luka, Mišin Kamăk cave, April 1988: 9000–9500 ind. (Beškov 1993, Beshkov 1998), Dec. 1988: 1 ind. (Beškov 1993, Beshkov 1998), 1991–1998 (Pandurska & Beshkov 1998a); – Gorna Luka, Peč cave, 30 Jan. 1961 (Beron 1962), 1991–1998 (Pandurska & Beshkov 1998a). – P a z a r d ž i k: Gabrovica, Golak, Golaškata Peštera mine (Beškov 1962), 20 July 1913(1914): 1m (Bureš 1917, Kovačev 1925), 8 Nov. 1940: 8000 ind. (Bureš 1941), 8 March 1958: 1 ind. (Beron 1958), 10 March 1958: 1m (Beron 1963), 30 March 1958: 1f (Beron 1963), 31 March 1958: 5000 ind. (Beron 1958, Beškov 1962), 31 March 1963 (Beron & Kolebinova 1965), 16–17 June 1991: 2000 ind. (Pandurska 1998, cf. Beškov 1993, Beshkov 1998); – Peštera, Ušagova Dupka [= Ušatovi Dupki] cave, 27 March 1978: 1 ind. (Nowosad et al. 1987), Ušatovi [Dupki] caves, 15 August 1985: nurs.

colony of 50–100 ind. (Grimmberger 1993). – P e r n i k: Bosnek, Duhlata cave, 14 April 1957: 2m, 1 ind. (Beron 1958, 1963), 18 May 1957: 120 ind. (Beron 1958), 27 Oct. 1957: 4m, 2 ind. (Beron 1958, 1963), 19 April 1958: 1m, 2f, 1 ind. (Beron 1958, 1963), 2 Nov. 1958: 3m, 3f (Beron 1963), 20 Dec. 1958: 1m, 1f (Beron 1963), 9 May 1959: 1f (Beron 1963), 20 Oct. 1963 (Beron 1973b), 21 Oct. 1963 (Beron & Kolebinova 1964); – Filipovci, cave, 1 May 1966 (Jančev & Stojkova 1973); – Gorna Vrabča, cave, 5 Oct. 1969 (Jančev & Stojkova 1973). – P l e v e n: Devenci, Hajduškata Peštera cave, 27 Sept. 1959 (Beron 1962), April 1989: 5000–5200 ind. (Beškov 1993, Beshkov 1998, cf. Pandurska 2003); – Gradište, 24 Oct. 1960: 1f (Beron 1963); – Muselievo, Nanin Kamăk cave, 9 March 1971 (Beron 1974b), 9 August 1971 (Beron 1972, 1973b, 1974b, cf. Beškov 1993, Beshkov 1998), 1968–1989: 1500–3250 ind. (Beškov 1993, Beshkov 1998); – Rakita, Sedlarkata cave, July 1988: 800–1000 ind. (Beškov 1993, Beshkov 1998); – Reselec, Temnata Dupka cave (Beškov 1993, Beshkov 1998); – Sadovec, Gininata Peštera cave, 11 Sept. 1968 (Beron 1970), July 1988: ca. 1500 ind. (Beškov 1993, Beshkov 1998), Dec. 1988: ca. 50 ind. (Beškov 1993, Beshkov 1998). – P l o v d i v: Asenovgrad, Asenova Krepost fortress, 6 June 1957 [NMNHS] (Hanák & Josifov 1959); – Dobrostan, Ledenika cave, 9 April 1978: 1 ind. (Nowosad et al. 1987); – Mostovo, Garvanica cave [= Gargina Dupka] (Beron 1964b), 21 August 1959 (Beron & Kolebinova 1964), 20 May 1975: 3m (Nowosad et al. 1987), 13 Sept. 1977: 56m, 4f, 1 ind. (Nowosad et al. 1987), 4 April 1978: 1m, 1 ind. (Nowosad et al. 1987), 4 May 1978: 16 ind. (Nowosad et al. 1987), 7 May 1978: 1 ind. (Nowosad et al. 1987), 4 June 1978: 1 ind. (Nowosad et al. 1987), 6 June 1978: 2 ind. (Nowosad et al. 1987), 16 June 1978: 3 ind. (Nowosad et al. 1987), 6 July 1978: 17 ind. (Nowosad et al. 1987). – R a z g r a d: Krivnja, Božkova Dupka cave, March 1989: several hundred ind. (Beškov 1993, Beshkov 1998). – R u s e: Besarbovo, 1 ind. (from owl pellets) (Mitev 1995); – Pepelina, Orlova Čuka cave, summer and winter colonies (Beškov 1993, Beshkov 1998), March 1989: several hundreds ind. (Beškov 1993, Beshkov 1998), Nov. 1989: 14,500–15,000 ind. (Beškov 1993, Beshkov 1998); – Pisanec, Lom river valley, 1935: 1f (Heinrich 1936); – Ruse, Srednija Čiflik [= Srednija Kula], cave (Kovačev 1906, 1925); – Ruse, Sv. Petka cave (Kovačev 1925); – Ruse [Červen], Zorovica cave, 25 July 1978: 6 ind. (Nowosad et al. 1987). – S l i v e n: Bjala, Dolnata Maaza cave, 13 June 1927 and/or 1–5 June 1935: many ind. (Atanasov 1936b); – Kotel, Drjanovskata Peštera cave, 9 April 1960 (Beron 1962); – Kotel, Lednika cave, 10 April 1960 (Beron 1962); – Kotel, Nirica cave, 6 Sept. 1975: 8m (Nowosad et al. 1987); – Kotel, Ovčata cave, 17 April 1960: 1 ind. (Nowosad et al. 1987), 23 Sept. 1977: 8m, 26f, 1 ind. (Nowosad et al. 1987); – Kotel, Temnata Dupka cave, 9 April 1975: 2m, 3f (Nowosad et al. 1987), 10 April 1975: 1m, 1f (Nowosad et al. 1987); – Kotel, Zelenič, Orlovata Peštera cave, 11 June 1958: obs. colony of ca. 6000 ind. (Beron 1958, cf. Beškov 1993, Beshkov 1998), 21 May 1968 (Jančev & Stojkova 1973), summer 1989: nurs. colony of ca. 3700 ind. (Beškov 1993, Beshkov 1998); – Kotel, Zlosten, Lednicata cave, Sept. 1970: 1500–1700 ind. (Beškov 1993, Beshkov 1998), Sept. 1989: 520–550 ind. (Beškov 1993, Beshkov 1998); – Medven, Maarata cave (Beron 1964b), 9 April 1975: 1m, 3f (Nowosad et al. 1987), 19 April 1975: 1f (Nowosad et al. 1987), 5 Sept. 1975: 5m (Nowosad et al. 1987), 6 Sept. 1975: 6m, 3f (Nowosad et al. 1987); – Sliven, Zmejovi Dupki cave, Dec. 1910 [NMNHS] (Bureš 1917, Kovačev 1925), 8 August 1957 (Beron 1958, cf. Beron 1964b). – S m o l j a n: Lăki, rocks in the valley bellow the town, 27 April 1985: 1 ind. (from owl pellets) (Obuch & Benda 1996); – Trigrad, Djavolskoto Gărlo cave, June 1977: ca. 400 ind. (Beshkov 1998), March 1989: ca. 10,250 ind. (Beškov 1993, Beshkov 1998), Nov. 1989: ca. 10,250 ind. (Beškov 1993). – S o f i j a: Beledie Han, Kolibata cave (Beron 1958), August 1955: colony of 600–800 ind. (mixed with large-sized *Myotis* sp.) (Beškov 1993, Beshkov 1998), 4 Oct. 1959: 1f (Beron 1963), 28 Oct. 1962 (Jančev & Stojkova 1973), August 1989: colony of 60–80 ind. (mixed with large-sized *Myotis* sp.) (Beškov 1993, Beshkov 1998), 24 June and 2 August 1995: 150 ind. (Pandurska 1998); – Botevgrad, 19 Nov. 1927 [NMNHS] (Hanák & Josifov 1959); – Bov, Mečata Peštera cave, 28 Oct. 1962 (Jančev & Stojkova 1973); – Cerovo, Vodnata Peštera cave, 10 May 1959 (Beron 1962), 1991–1998 (Pandurska & Beshkov 1998a); – Dragovištica, gallery, 8 Oct. 1959: 1f (Beron 1963); – Gaber, Pešterata cave, 23 April 1960 (Beron 1962); – Ginci, Dinevata Pešt cave, 4 July 1959 (Beron 1962), 5 Dec. 1959: 1f (Beron 1963), 24 Oct. 1967 (Jančev & Stojkova 1973), 30 Oct. 1967 (Jančev & Stojkova 1973), 10 May 1968 (Jančev & Stojkova 1973), nettings 1990–1994: 7 ind. (Pandurska et al. 1999), 1991–1998 (Pandurska & Beshkov 1998a); – Iskrec, Dušnika cave [= Pešta cave, 28 Febr. 1913, NMNHS, leg. P. Petkov] (Bureš 1917, Kovačev 1925), 8 Oct. 1940: 1 ind. (Bureš 1941, 1942), 15 Oct. 1940: 3 ind. (Bureš 1941); – Kalotina, Peruna Dupka cave, 14 Sept. 1958 (Beron 1962); – Kătina, gallery (Beron 1958); – Kokaljane, Urvič, gallery (Kvartirnikov 1956), 8 Nov. 1940: 1 ind. (Beron 1963), 8 May 1955 [NMNHS] (Hanák & Josifov 1959), 6 Oct. 1955: 1 ind. (Beron 1958, 1963), 23 Oct. 1955: 1m (Beron 1963), 1 May 1956: 110 ind. (Beron 1958), 6 May 1956: 1f (Beron 1958, 1963), 4 Oct. 1956: 9 ind. (Beron 1958, 1963), 29 Nov. 1956: 1m (Beron 1958, 1963), 31 March 1957: 79 ind. (Beron 1958, 1963), 6 April 1957: 1f, 1 ind. (Beron 1958, 1963), 27 April 1957: 1f, 2 ind. (Beron 1958, 1963), 18 May 1957: 1m (Beron 1958, 1963), 3 Sept. 1957: 1m (Beron 1958, 1963), 20 Oct. 1957: 1m, 2f (Beron 1963), 18 Nov. 1957: 1 ind. (Beron 1958), 6 April 1958: 4m, 4f (Beron 1958, 1963), 12 April 1958: 2m, 1f, 1 ind. (Beron 1958, 1963), 24 April 1958: 4m (Beron 1958, 1963), 23 Oct. 1958: 1m (Beron 1963), 1 March 1959: 1m, 1f (Beron 1963), 8 March 1959: 3f, 1 ind. (Beron 1963),

21 March 1959: 1 ind. (Beron 1963), 22 March 1959: 1m, 3f, 1 ind. (Beron 1963), 3 April 1959: 1m, 2f, 2 ind. (Beron 1963), 5 April 1959: 1f, 2 ind. (Beron 1961, 1963), 12 April 1959: 1m (Beron 1963), 5 May 1959: 1m, 3f (Beron 1963), 27 May 1959: 1 ind. (Beron 1963), 12 June 1959: 1m (Beron 1963), 11 Sept. 1959: 1m (Beron 1963), 1 Oct. 1959: 1f (Beron 1963), 16 Oct. 1959: 1f (Beron 1963), 24 Oct. 1959: 1m (Beron 1963), 16 Nov. 1960: 1m, 1f (Beron 1963), 10 May 1961 (Jančev & Stojkova 1973), 23 Oct. 1962 (Jančev & Stojkova 1973), 18 Nov. 1962 (Beron & Kolebinova 1964), 1 Oct. 1963 (Beron & Kolebinova 1964), 13 Oct. 1963 (Beron & Kolebinova 1964), 3 Nov. 1963 (Beron & Kolebinova 1964), 3 Sept. 1964 (Beron 1968), 9 May 1965 (Jančev & Stojkova 1973), 8 April 1971 (Beron 1973a, 1974a); – Lakatnik, cave, 4 Nov. 1961 (Jančev & Stojkova 1973), 19 Nov. 1961 (Jančev & Stojkova 1973), 20 Oct. 1962 (Jančev & Stojkova 1973), 11 Dec. 1962 (Jančev & Stojkova 1973), 6 Jan. 1963 (Jančev & Stojkova 1973), 11 March 1964 (Jančev & Stojkova 1973), 7 Jan. 1968 (Jančev & Stojkova 1973); – Lakatnik, Golemata Vraža Dupka cave, 8 Nov. 1958 (Beron 1962), 24 May 1959: 1f (Beron 1963); – Lakatnik, Răžiškata (= Suhata) Peštera cave (Drenski 1961), colonies of 150–250 ind. up to 70 ind. (Kvartrnikov 1956), 750 ind. (Beron 1958), 22 March 1922 [NMNHS] (Hanák & Josifov 1959), 4 April 1943: 1 ind. (Beron 1963), 20 Febr. 1955 [2ma; NMNHS] (Hanák & Josifov 1959), 4–7 Jan. 1956: large colony (Kvartirnikov 1957), 1 Jan. 1957: 25 ind. (Beron 1958, 1963), 16 Nov. 1957: 5m, 5f, 1 ind. (Beron 1958, 1963), 31 Dec. 1957: 1m, 3f, 1 ind (Beron 1958, 1963), 1 Jan. 1958: 2 ind. (Beron 1958), 8 Nov. 1958: 2m (Beron 1963), 20 Dec. 1958: 1m (Beron 1963), 5 April 1959: 14 ind. (Hůrka 1962), 18 Oct. 1959: 1m (Beron 1963), 8 Nov. 1959: 7m, 3f (Beron 1963), 5 Nov. 1961: 1m (Beron 1963), 27 Oct. 1963 (Beron & Kolebinova 1964); – Lakatnik, Svinskata cave, 1991–1998 (Pandurska & Beshkov 1998a); – Lakatnik, Temnata Dupka cave (Drenski 1955, Kvartirnikov 1956); – Lipnica, Kozarnika cave, 1991–1998 (Pandurska & Beshkov 1998a); – Lipnica, Vodnata Peštera cave, 10 May 1959: 1m (Beron 1963), 2 May 1960 (Beron 1962), 13 Oct. 1963 (Jančev & Stojkova 1973), 5 May 1971 (Beron 1973a, 1974b), 1960–1973: colonies of 300–400 ind. (Beškov 1993, Beshkov 1998); – Pančarevo, 6 Jan. 1963 (Jančev & Stojkova 1973). – S t a r a Z a g o r a: Boruštica, Toplata Dupka cave, 7 August 1960 (Beron 1962), 5 May 1961 (Jančev & Stojkova 1973). – Š u m e n: Madara, Madarskija Konnik crevice [= Hiljadite Očički cave], summer: nurs. colonies of ca. 2600–2650 ind. (Beškov 1993, Beškov et al. 1994, Beshkov 1998); – [Preslav], Patlejna reserve, 1973–1975 (from owl pellets) (Simeonov 1985). – T ă r g o v i š t e: Prolaz, Marina Dupka cave, resp. Prolaz, Prolazkata cave, summer 1958: several thousands ind. (Beškov 1993, Beshkov 1998), 1 August 1960: ca. 2000 ind. (Beron 1962,

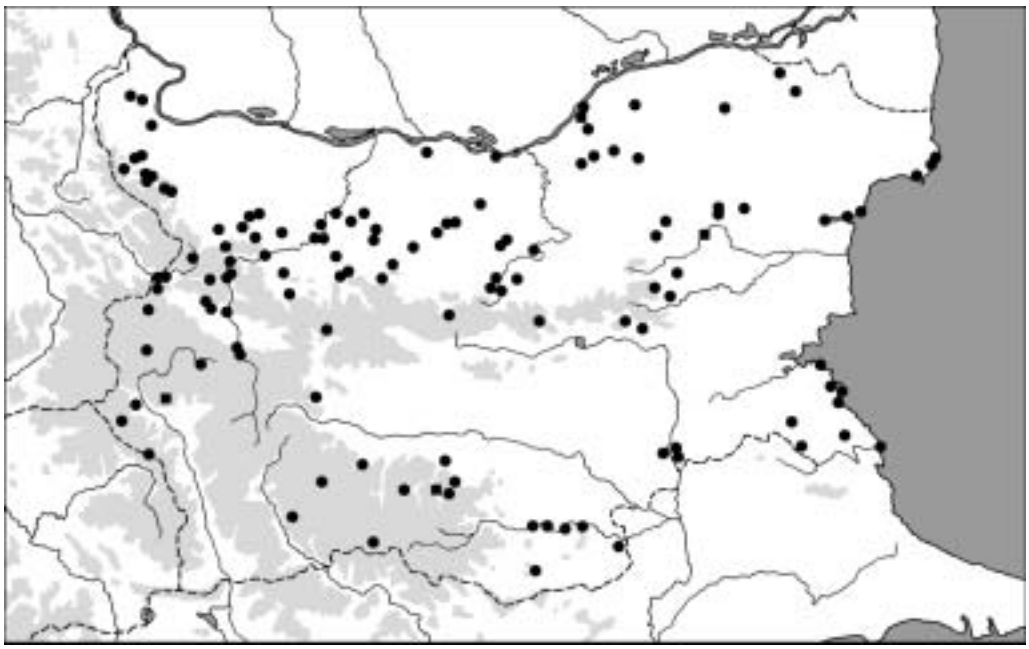

Fig. 27. Records of *Miniopterus schreibersii* (Kuhl, 1817) in Bulgaria. Explanation of symbols as in Fig. 3.

Ivanova 2001), summer 1970: several thousands ind. (Beškov 1993, Beshkov 1998), winter 1971: 5000–8000 ind. (Beškov 1993, Beshkov 1998), summer 1988: 13,500–14,000 ind. (Beškov 1993, Beshkov 1998), winter 1988: 5000–7000 ind. (Beškov 1993, Beshkov 1998), summer 1989: 8000–9000 ind. (Beshkov 1998). – V a r n a: Varna, Evksinograd [11 March 1903: coll. 1fa, NMNHS 033-12] (Bureš 1917, Kovačev 1906, 1925), 11 March 1930 [1ma; NMNHS] (Hanák & Josifov 1959). – V e l i k o T ă r n o v o: Beljakovec, Carskata Peštera cave, March 1988: ca. 1600 ind. (Beškov 1993, Beshkov 1998); – Beljakovec, Goljama Podlisca cave, 24 May 1924: many ind. (Bureš 1926), 14 August 1958: 1m (Beron 1963); – Beljakovec, Malka Podlisca cave, 1m (Beron 1963); – Emen, Emenskata Peštera cave, a visit in January, ca. 50 ind. (Beškov 1993, Beshkov 1998). – V i d i n: Belogradčik, Magura cave, 27 July 1948 [NMNHS] (Hanák & Josifov 1959); – Dolni Lom, Desni Suhi Peč cave, 1991–1998 (Pandurska & Beshkov 1998a, cf. Pandurska 2003); – Dolni Lom, Levi Suhi Peč cave, 14 July 1960: 40–50 ind. (Beron 1961, 1962); – Dolni Lom, Vodni Peč cave, 17 Sept. 1964 (Beron & Guéorguiev 1967); – Družba (Sv. Petăr) [= Car Petrovo], Vărkan cave, 20 Oct. 1969 (Beron 1972); – Orešec, Propast chasm, 20 Oct. 1969 (Beron 1972); – Orešec, Suhi Peč cave, 12 July 1960 (Beron 1962, cf. Beron 1964b), April 1988: colony of 7500–8000 ind. (Beškov 1993, Beshkov 1998), Dec. 1988: several ind. (Beškov 1993, Beshkov 1998), 1991–1998 (Pandurska & Beshkov 1998a); – Repljana, Golemata Dupka cave, 23 Oct. 1971 (Beron 1972); – Stakevci [Kračimir], Kračimirskoto Vrelo cave, 23 Oct. 1971 (Beron 1972); – Vojnica, Studena cave, 19 Oct. 1969 (Beron 1972). – V r a c a: Beli Izvor, Kalna Mătnica cave, 2 Nov. 1967 (Jančev & Stojkova 1973), 1965–1971: colonies of 1000–1500 ind. (Beškov 1993, Beshkov 1998), July 1988: colony of ca. 2500 ind. (Beškov 1993, Beshkov 1998), 24 April 1997: ca. 2500 ind. (Pandurska 2003), 1991–1998 (Pandurska & Beshkov 1998a); – Čiren, Malkata Peštera cave, 27 Oct. 1960 (Beron 1961); – Čiren, Ponora cave, 24 Oct. 1960: 150 ind. (Beron 1961, 1962), 25 Oct. 1960: 1m (Beron 1963), 1958–1966: large colony (Beškov 1993, Beshkov 1998); – Kalen, Čakovska Pešt cave, 8 Sept. 1959 (Beron 1962); – Kalen, Kalenska Peštera cave, 8 Sept. 1959: colony of 100 ind. (Beron 1961, 1962), March 1988: 400–500 ind. (Beškov 1993, Beshkov 1998), March 1989: ca. 260 ind. (Beškov 1993, Beshkov 1998); – Kunino, cave, March 1960: 2 ind. (Beron 1963); – Liljače, Božijat Most cave, July 1958: colony of several thousands ind. (mixed with large-sized *Myotis* sp.) (Beškov 1993, Beshkov 1998), 28 July 1989: obs. colony of 200–300 ind. (Grimmberger 1993); – Liljače, Prilepnata Peštera cave, 7 July 1960 (Beron 1961, 1962), 16 August 1963 (Beron & Kolebinova 1964); – Ljutibrod, Gara Čerepiš, Serapionovata Peštera cave, summer visits: 2600–2900 ind. (Beškov 1993, Beshkov 1998), winter visit: ca. 1500 ind. (Beškov 1993, Beshkov 1998), 1 May 1959 (Beron 1962), March 1963: thousands ind. (Beron 1964b), 18 and 21 March 1963 (Jančev & Stojkova 1973), 5 July 1991 and 25 July 1992: 1000 ind. (Pandurska 1998), 1991–1998 (Pandurska & Beshkov 1998a, Pandurska 2003); – Vraca, Gorn'o-Kremenskata Peštera cave (Kovačev 1906, 1925).

DISTRIBUTIONAL STATUS (Fig. 27). *M. schreibersii* is one of the most common Mediterranean cavernicolous species in Bulgaria (175 localities; Tab. 11) and the fourth most frequently recorded bat species in Bulgaria. The general pattern of its distribution and abundance is similar to that of the most common *Rhinolophus* species (*R. ferrumequinum* and *R. hipposideros*, see above and Figs 2, 3). It inhabits mainly karstic areas at lower altitudes up to 800 m a. s. l., the highest record was at 1400 m a. s. l. (Central Balkan Mts.). Like elsewhere in the southern Balkans, it forms large nursery colonies in spacious caves (typically about 1000 individuals on average) and hibernates in large protected caves as well, often in very large colonies (up to 40,000 individuals). The data set includes also records of individuals in their shelters and netted individuals. External and cranial dimensions of examined specimens of *M. schreibersii* from Bulgaria are shown in Tab. 10.

NOTE. Heinrich (1936) described a new subspecies *Miniopterus schreibersii inexpectatus* (terra typica: bulgarischer Strandjabalkan = Strandža Mts., Bulgaria) based on specimens with two-colour fur, obviously due to molting. The name has generally been considered a junior synonym of the nominate *M. s. schreibersii* (Kuhl, 1817) (see Benda & Horáček 1998, Hanák et al. 2001).

Tadarida teniotis (Rafinesque, 1814)

RECORDS. **Original data**: B l a g o e v g r a d: Rožen, rocky ridge [1], 18 Sept. 1988: det. 1–2 hunting ind. – H a s k o v o: Careva Poljana [2], 7 Oct. 2003: det. 1 ind. (leg. R. Lučan); – Dolno Čerkovište [3], Orešari reserve, 30 Sept. 2003: obs. 1 ind. (leg. R. Lučan); – Madžarovo, town [4], 25 Oct. 2002: det. 1 ind. (leg. R. Lučan); – Madžarovo, rocky cliffs [5], 11 Sept. 2002: obs. and det. 1 ind. (cf. Buis & Ivanova 2002), 28 Oct. 2002: obs. colony of ca. 30 ind., net. 1mj (leg. R. Lučan), 30 Sept. 2003: obs. and det. 10–15 ind. (leg. R. Lučan);

– Rabovo [6], Arda river, 5 Oct. 2003: det. 2 ind. (leg. R. Lučan). – S m o l j a n: Jagodina, a rocky wall in valley [7], 16 August 1978: obs. 1–2 flying ind. – **Published data**: B l a g o e v g r a d: Ploski, rocky crevice [8], 6 June 1990: 1m (Pandurska 1992, Pandurska & Beshkov 1998b). – P l o v d i v: Rodopi Mts. south of Plovdiv [9], 23 May 1961: 1m (Kalčev & Beškov 1963). – S m o l j a n: Lăki, rocks in the valley bellow the town [10], 27 April 1985: 1 ind. (from owl pellets) (Obuch & Benda 1996).

DISTRIBUTIONAL STATUS (Fig. 24). Kalčev & Beškov (1963) were the first who published a record of *T. teniotis* in Bulgaria. This remained the only record for thirty years, further records were published as late as in 1990s (Pandurska 1992, Obuch & Benda 1996). Till now, the species has been known from 10 localities in Bulgaria (Tab. 11), all of them situated in rocky gorges of mountain and highland rivers in south-western Bulgaria (Pirin Mts., Rhodopes Mts., up to 1200 m a. s. l.). For the first time in Bulgaria, a colony of *T. teniotis* was documented in a rocky crevice of the Arda River valley (Fig. 28). Marica River valley in southern Bulgaria represents the known northern border of distribution of *T. teniotis* in the eastern Balkans. Its geographic latitude corresponds to the northernmost records of the species in Macedonia and Albania (Kryštufek et al. 1998, Lamani 1970). Due to the Mediterrannean climate, the distribution range of *T. teniotis* reaches further north in the western part of the Balkans (Đulić 1959, Červený & Kryštufek 1988).

DISCUSSION AND CONCLUSIONS

In the present review we have summarised the occurrence of a total of 32 bat species on the territory of Bulgaria, i. e. nearly all European species, except for the insular endemic taxa (Mitchell-Jones et al. 1999) and the newly defined species of the genus *Plecotus* (Kiefer & Veith 2002, Kiefer

Fig. 28. An individual of *Tadarida teniotis* (Rafinesque, 1814) found in a rocky crevice near Madžarovo, on 11 Sept. 2002. Later, a colony of 30 individuals was found on the same place.

et al. 2002, Spitzenberger et al. 2001, 2002, 2003). Two of them occur in the Balkan Peninsula (i. e. *P. kolombatovici* and *P. macrobullaris*), and can be expected to appear also in Bulgaria (Benda & Ivanova 2003). The definition of the records of some bats of the *Myotis mystacinus* group remains still uncertain: through morphological comparison, 11 of the records of "small forms" were identified as either *M. mystacinus* or *M. alcathoe*; neither form has been definitely confirmed or rejected, and in our total these two species are taken as one. Should in future both of them be shown to occur in Bulgaria, which is most probable, the total number of bat species in the fauna of Bulgaria would then increase to 33. Thus the bat species diversity known in Bulgaria can be considered extreme in regard of the relatively small extent of the country.

In Bulgaria one can encounter with "boreal" species typical of the mixed forests of central and northern Europe; with strictly "Mediterranean" ones which in Bulgaria attain the northernmost limit of their range; and with species which, by their distribution and basic ecological requirements, form various degrees of transition between the two extreme types.

The species most often denoted as "boreal" have been documented in Bulgaria only once, by the find of a cadaver (*Eptesicus nilssonii*) or by a record of the echolocation signal (*Myotis dasycneme*). Both these species reach Bulgaria at the southern limit of their ranges only. *Myotis brandtii* is another such species, although recorded in Bulgaria several times (at least 7 records). The limits of the known range of this species attain the southern border of Bulgaria. A further group of species, which can be considered "largely boreal" by the density of records throughout their European ranges (cf. Mitchell-Jones et al. 1999), have been documented in 25–30 records in Bulgaria, and they occur as far south as Greece (cf. Hanák et al. 2001): *Myotis daubentonii* and *Plecotus auritus* (the north of Greece), *Barbastella barbastellus* (the middle of Greece), *Myotis bechsteinii* and *M. nattereri* (the Peloponnese). This group would also contain *Myotis mystacinus* (s. str.) but its presumed presence in Bulgaria must be confirmed by genetic analysis.

The species which in Bulgaria attain the northern limit of their Balkan ranges and can thus be denoted as "true Mediterranean" can be divided into two groups. The first one comprises species whose ranges only reach into the south of Bulgaria and do not go over the massif of the Balkan Mts. in the northern direction: *Pipistrellus kuhlii* and *Tadarida teniotis*. The other group comprises species whose Balkan ranges are limited in the north by the Danube, even though in the western part of the Balkans they may reach more to the north: *Rhinolophus blasii*, *Myotis aurascens*, *Hypsugo savii* and, to a certain extent, *Rhinolophus mehelyi* and *Myotis capaccinii*. However, the probable natural northern limit of the ranges of these species lies as far as the southern slopes of the Southern Carpathians in Romania. Apparently, the present idea of their distribution is due to the fact that records of bats in the Walachian Lowland, Romania, are generally very scanty (cf. Valenciuc 1993, 1994, Mitchell-Jones et al. 1999).

Most other species, i. e. *Rhinolophus ferrumequinum*, *R. hipposideros*, *R. euryale*, *Myotis myotis*, *M. blythii*, *M. emarginatus*, *Eptesicus serotinus*, *Plecotus austriacus*, and *Miniopterus schreibersii*, can be denoted as "originally Mediterranean". Their distribution covers the whole of Bulgaria but they widely invade Romania and the northern limit of their ranges lies in several zones in central Europe, from the northern edge of the Carpathian Basin down to the southern shore of the Baltic Sea (cf. Mitchell-Jones et al. 1999). Thus the territory of Bulgaria is one of the basic ranges of these species and, in the past, it apparently was the foreland for their dispersal towards the north into central Europe. From the viewpoint of Eastern Mediterranean biogeography (Horáček et al. 1998, 2000), most of the species in the last group are among the "core elements" of the bat fauna of that region.

A separate group comprises migratory species (sensu Strelkov 1969, 1971), i. e. *Vespertilio murinus*, *Pipistrellus nathusii*, and species of the genus *Nyctalus*. With varying frequency of

Tab. 11. Number of bat records in individual biogeographic units of Bulgaria (see text and Fig. 29)

species \ region	1a	1b	1c	1	2a	2b	2c	2	3	4	5	6a	6b	6c	6	7	Σ
Rhinolophus ferrumequinum	11	24	21	56	85	17	16	118	18	37	14	1	5	28	34	19	296
Rhinolophus hipposideros	6	17	15	38	82	15	12	109	20	38	18	2	5	27	33	16	274
Rhinolophus euryale	3	13	5	21	32	4	12	48	3	5	7	–	3	8	11	9	104
Rhinolophus mehelyi	–	5	5	10	3	1	5	9	–	–	1	–	3	5	8	1	29
Rhinolophus blasii	–	4	2	6	24	1	2	27	5	3	3	–	2	9	11	5	60
Myotis myotis	9	14	11	34	62	8	15	85	10	25	6	2	2	16	20	4	184
Myotis blythii	1	10	8	19	36	5	10	51	7	22	5	1	2	–	3	9	117
Myotis bechsteinii	–	1	–	1	11	3	2	16	–	4	1	–	1	2	3	2	27
Myotis nattereri	–	1	1	2	10	–	1	11	1	12	6	–	–	1	1	1	34
Myotis emarginatus	–	10	3	13	17	5	5	27	1	13	5	–	3	3	6	6	73
Myotis mystacinus / alcathoe	–	–	2	2	–	–	–	–	1	5	2	–	–	–	–	1	11
Myotis aurascens	–	1	–	1	1	3	1	5	1	5	5	2	–	3	5	–	22
Myotis brandtii	–	–	(2)	–	2	2	–	4	–	3	–	–	–	–	–	–	7
Myotis daubentonii	–	6	4	10	5	5	3	13	3	2	1	–	–	1	1	6	36
Myotis dasycneme	–	1	–	1	–	–	–	–	–	–	–	–	–	–	–	–	1
Myotis capaccinii	3	14	6	23	26	4	–	30	3	5	2	–	3	8	11	5	79
Vespertilio murinus	–	–	5	5	3	3	–	6	3	8	1	–	–	–	–	–	23
Eptesicus serotinus	–	5	14	19	20	1	4	24	2	14	6	4	1	3	8	5	79
Eptesicus nilssonii	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	1
Hypsugo savii	–	3	3	6	18	6	4	28	4	10	12	–	–	4	4	3	67
Pipistrellus pipistrellus s. l.	–	2	17	19	13	3	6	22	2	7	5	3	–	18	21	16	92
Pipistrellus nathusii	–	2	11	13	–	–	–	–	4	1	1	2	1	2	5	4	28
Pipistrellus kuhlii	–	–	(1)	–	–	–	–	–	–	–	5	–	–	–	–	4	9
Nyctalus noctula	–	8	27	35	11	4	7	22	7	5	2	5	1	5	11	10	92
Nyctalus leisleri	–	1(2)	2	3	–	2	2	4	1	–	1	–	–	–	–	3	12
Nyctalus lasiopterus	–	–	1	1	–	–	–	–	1	2	2	–	–	1	1	4	11
Barbastella barbastellus	–	1	–	1	3	5	1	9	–	8	1	1	–	1	2	2	23
Plecotus auritus	–	–	–	–	6	5	1	12	2	13	–	–	–	–	–	1	28
Plecotus austriacus	1	4	11	16	38	1	6	45	13	7	8	–	1	7	8	3	101
Miniopterus schreibersii	5	22	15	42	48	9	24	82	13	11	2	1	4	7	12	13	174
Tadarida teniotis	–	–	–	–	–	–	–	–	–	3	2	–	–	5	5	–	10
total (no. records)	39	168	189	397	556	112	139	807	125	269	124	24	37	164	224	152	2104
total (no. species)	8	23	22	26	23	23	21	24	23	27	27	11	15	22	23	25	31
records per species	4.9	7.3	8.6	15.0	24.0	4.9	6.6	34.0	5.4	9.9	4.6	2.2	2.5	7.5	9.7	6.1	67.8

records, these species have been recorded throughout Bulgaria, all of the country lying on a part of their seasonal migration routes. In Bulgaria and the north of Greece, *Vespertilio murinus* and *Nyctalus noctula* attain the southernmost regions of the probable occurrence of migratory (hibernating) and resident (summer) populations. *Pipistrellus nathusii*, *Nyctalus leisleri*, and *N. lasiopterus* have been also found in the south of Greece. The analytic conclusions of Strelkov (1997, 1999, 2000), who considers the members of the Balkan populations of *V. murinus*, *P. nathusii* and *N. noctula* to be wintering individuals from central and eastern European colonies and/or, during summer, only males or non-reproducing females, have only been confirmed in the case of *V. murinus* and, apparently, they also hold true for *N. leisleri*. On the contrary, they are not quite valid for *N. noctula* and *P. nathusii*, as parts of the populations of these two species will most probably reproduce in the Balkans (see comments on the individual migratory species). Of course, this problem would require targeted investigations and evaluation covering the whole of the Balkan Peninsula. Also outside the faunistic evaluation are the two species of the *Pipistrellus pipistrellus* complex. Both occur in Bulgaria; they are very numerous in the south of the Balkan Peninsula, including a number of islands (cf. Benda et al. 2003a), yet their range reaches up to Scandinavia (Mitchell-Jones et al. 2001, Mayer & Helversen 2001). Thus the two *Pipistrellus* species show the widest dispersion in the N-S direction of all Bulgarian and obviously even European bat species, since they are numerous at both the northern and southern limits of their range, which lacks the N-S gradient in the density of records, as observed in all other European bat species.

Rhinolophus ferrumequinum and *R. hipposideros* are the most abundant bat species in Bulgaria (Tabs 11, 12). Both have been found in over 270 localities and account for 27.1% of all bats recorded in the country. A further numerous group, with 170–190 localities per species, comprises

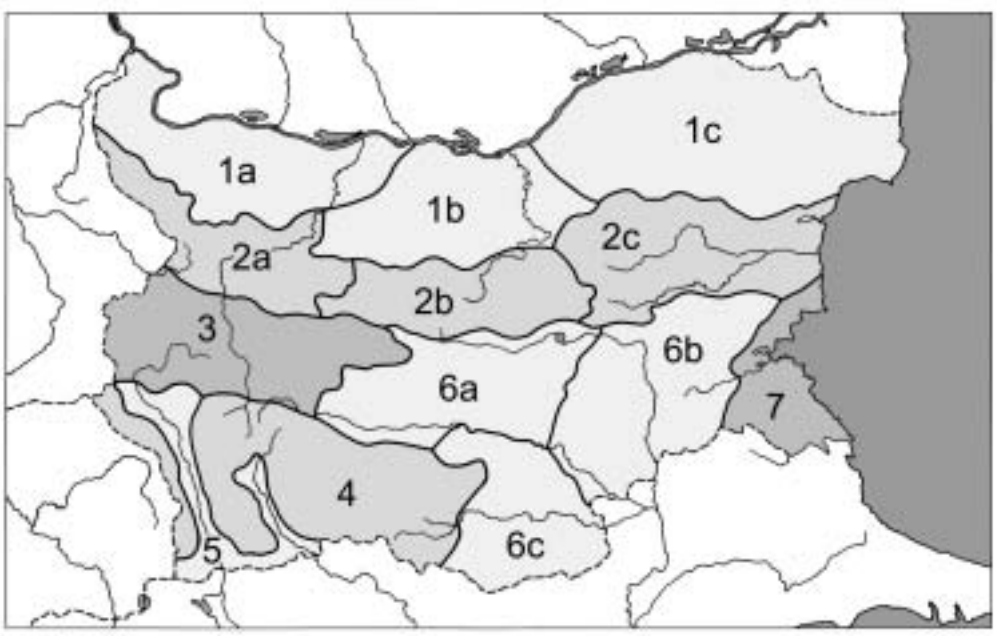

Fig. 29. Map of Bulgaria, showing subdivision into biogeographic regions and lower units used in biogeographical comparison.

Tab. 12. Bat records in individual biogeographic units in per cent per unit (cf. Tab. 11)

species \ region	1a	1b	1c	2a	2b	2c	3	4	5	6a	6b	6c	7	Σ
R. ferrumequinum	28.2	14.3	11.1	15.3	15.2	11.5	14.4	13.8	11.3	4.2	13.5	17.1	12.5	14.1
R. hipposideros	15.4	10.1	7.9	14.8	13.4	8.6	16.0	14.2	14.5	8.3	13.5	16.5	10.5	13.0
R. euryale	7.7	7.7	2.6	5.8	3.6	8.6	2.4	1.9	5.6	–	8.1	4.9	5.9	5.0
R. mehelyi	–	3.0	2.6	0.5	0.9	3.6	–	–	0.8	–	8.1	3.0	0.7	1.4
R. blasii	–	2.4	1.1	4.3	0.9	1.4	4.0	1.1	2.4	–	5.4	5.5	3.3	2.9
M. myotis	23.0	8.3	5.8	11.2	7.1	10.8	8.0	9.3	4.8	8.3	5.4	9.8	2.6	8.8
M. blythii	2.6	6.0	4.2	6.5	4.5	7.2	5.6	8.2	4.0	4.2	5.4	–	5.9	5.5
M. bechsteinii	–	0.6	–	2.0	2.7	1.4	–	1.5	0.8	–	2.7	1.2	1.3	1.3
M. nattereri	–	0.6	0.5	1.8	–	0.7	0.8	4.5	4.8	–	–	0.6	0.7	1.6
M. emarginatus	–	6.0	1.6	3.1	4.5	3.6	0.8	4.5	4.0	–	8.1	1.8	3.9	3.4
M. mystacinus / alcathoe	–	–	1.1	–	–	–	0.8	1.9	1.6	–	–	–	0.7	0.5
M. aurascens	–	0.6	–	0.2	2.7	0.7	0.8	1.9	4.0	8.3	–	1.8	–	1.0
M. brandtii	–	–	–	0.4	1.8	–	–	1.1	–	–	–	–	–	0.3
M. daubentonii	–	3.6	2.1	0.9	4.5	2.2	2.4	0.7	0.8	–	–	0.6	3.9	1.7
M. dasycneme	–	0.6	–	–	–	–	–	–	–	–	–	–	–	0.0
M. capaccinii	7.7	8.3	3.2	4.7	3.6	–	2.4	1.9	1.6	–	8.1	4.9	3.3	3.8
V. murinus	–	–	2.6	0.5	2.7	–	2.4	3.0	0.8	–	–	–	–	1.1
E. serotinus	–	3.0	7.4	3.6	0.9	2.9	1.6	5.2	4.8	18.7	2.7	1.8	3.3	3.8
E. nilssonii	–	–	–	–	–	–	–	0.4	–	–	–	–	–	0.0
H. savii	–	1.8	1.6	3.2	5.4	2.9	3.2	3.7	9.7	–	–	2.4	2.0	3.2
P. pipistrellus s. l.	–	1.2	9.0	2.3	2.7	4.3	1.6	2.6	4.0	12.5	–	11.0	10.5	4.4
P. nathusii	–	1.2	5.8	–	–	–	3.2	0.4	0.8	8.3	2.7	1.2	2.6	1.3
P. kuhlii	–	–	–	–	–	–	–	–	4.0	–	–	–	2.6	0.4
N. noctula	–	4.8	14.3	2.0	3.6	5.0	5.6	1.9	1.6	20.8	2.7	3.0	6.6	4.4
N. leisleri	–	0.6	1.1	–	1.8	1.4	0.8	–	0.8	–	–	–	2.0	0.6
N. lasiopterus	–	–	0.5	–	–	–	0.8	0.7	1.6	–	–	0.6	2.6	0.5
B. barbastellus	–	0.6	–	0.5	4.5	0.7	–	3.0	0.8	4.2	–	0.6	1.3	1.1
P. auritus	–	–	–	1.1	4.5	0.7	1.6	4.9	–	–	–	–	0.7	1.3
P. austriacus	2.6	2.4	5.8	6.8	0.9	4.3	10.4	2.6	6.5	–	2.7	4.3	2.0	4.8
M. schreibersii	12.8	13.1	7.9	8.6	8.0	17.3	10.4	4.1	1.6	4.2	10.8	4.3	8.6	8.3
Tadarida teniotis	–	–	–	–	–	–	–	1.1	1.6	–	–	3.0	–	0.5

Myotis myotis and *Miniopterus schreibersii* (in all, 17.1% of records). The four species mentioned above are primarily cave-dwellers, forming numerous colonies in caves. They can clearly be considered the most numerous and most common bat species in Bulgaria. Also, they are the only ones found in all 13 biogeographic units of Bulgaria (Fig. 29, Tabs 11–13). The group of abundant species could also include *Rhinolophus euryale*, *Myotis blythii*, *Pipistrellus pipistrellus* s. l., *Nyctalus noctula* and *Plecotus austriacus*. Each of them have been found in 90–120 localities, they account for 24.1% of all records of bats in Bulgaria, and they have been found in 12 biogeographic units of Bulgaria (Tabs 11–13). The bat species mentioned thus far constitute the dominant component of the Bulgarian bat fauna, as they account for 68.3% of all records

A group of relatively numerous bat species comprises *Rhinolophus blasii*, *Myotis emarginatus*, *M. capaccinii*, *Eptesicus serotinus*, and *Hypsugo savii*. All members of this group have been found in 60–80 localities per species, and they account for 17.1% of all records of bats in Bulgaria. All species mentioned thus far are distributed all over Bulgaria and, except for *P. pipistrellus* s. l. and *N. noctula*, they belong to the "originally Mediterranean" faunal group (*M. capaccinii* has been included in this group with some reservation). The remaining 17 species (i. e. 54.8% of the bat fauna of Bulgaria) are an accessory component (in all, 14.6% of records). They occur (or have been found) in Bulgaria in isolated areas and are known from less than 40 localities (1–36). This group mainly includes the "boreal" species (*Myotis bechsteinii*, *M. nattereri*, *M. brandtii*, *M. daubento-*

nii, *Barbastella barbastellus*, and *Plecotus auritus*), the "true Mediterranean" ones (*Rhinolophus mehelyi*, *Myotis aurascens*, *Pipistrellus kuhlii*, and *Tadarida teniotis*), and the true or facultative migratory species (*Vespertilio murinus*, *Pipistrellus nathusii*, *Nyctalus leisleri*, and *N. lasiopterus*).

For the purpose of a biogeographic comparison, the territory of Bulgaria was subdivided into seven main units (Fig. 29, Tabs 11–13), delimited with respect to the vegetation maps of the Balkan Peninsula (Horvat et al. 1974, Bondev 1991, Velčev 2002) and modified with respect to the traditional zoogeographical subdivision of the Bulgarian territory (Drenski 1966, Georgiev 1982, Hubenov 1997): (1) Danubian Lowland: deforested cultivated land with steppes and small patches of thermophilous woodland with *Quercus robur*, *Q. frainetto*, *Q. cerris*, and *Acer tataricum* (1a Western Danubian Lowland; 1b Central Danubian Lowland; 1c Eastern Danubian Lowland, incl. Ludogorie Plateau); (2) the Balkan and Predbalkan Mts.: woodland of colline or mountain belt with *Quercus frainetto*, *Q. cerris* and *Fagus moesiaca* (2a Western Balkan and Predbalkan Mts.; 2b Central Balkan and Predbalkan Mts.; 2c Eastern Balkan and Predbalkan Mts.); (3) Transitional area of lower mountains and intermountain basins with a mosaic of farmland and woodland of colline or mountain belt (*Quercus frainetto*, *Q. cerris*, and *Fagus moesiaca*) (the Sofia Basin, Vitoša Mts., Konjavska Mts., Sredna Gora Mts., etc.); (4) South-western high mountains: area of mountain beech woodland with *Fagus moesiaca* and/or subalpine coniferous woodland with species of *Pinus*, *Picea* and *Abies* (Vlahina Mts., Maleševska Mts. and Osogovska Mts., Rila Mts., Pirin Mts, Western Rhodopes Mts.); (5) South-western Mediterranean region of Struma and Mesta valleys: cultivated land with patches of alluvial woodland of *Platanus orientalis*; (6) Upper Thrace: mostly deforested pasture land with steppe grassland (6a Western Upper Thracian Lowland; 6b Eastern Upper Thracian Lowland; 6c Eastern Rhodopes); (7) South-eastern Mediterranean region of Stranža Mts. and southern Black Sea coast: area dominated by thermophilous Euxinean woodland with *Quercus petraea* agg. and *Q. frainetto*.

The structure of chiropteran records, expressed as the percentage of records per biogeographic unit (Fig. 29, Tab. 12) was examined by means of parametric correlation and UPGMA cluster analysis. The results (Fig. 30) have divided the Bulgarian territory into three regions exhibiting a corresponding degree of faunal similarity, viz., (I) Relatively humid higher mountains and karstic

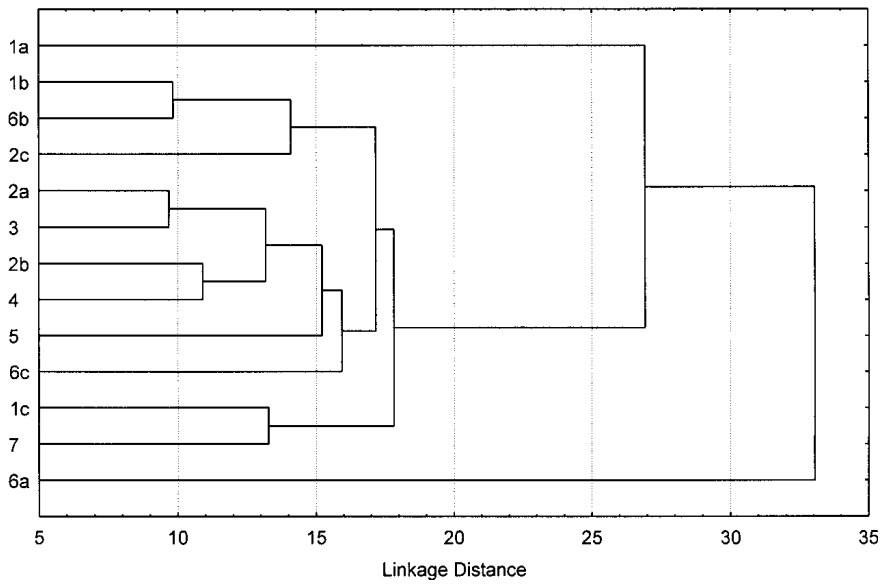

Fig. 30. Results of UPGMA cluster analysis of correlations among bat communities in individual biogeographical units, based on data summarised in Tab. 12 (see also Fig. 28).

Tab. 13. Bat records in individual biogeographic units in per cent of individual species records (cf. Tab. 11)

species \ region	1a	1b	1c	1	2a	2b	2c	2	3	4	5	6a	6b	6c	6	7
R. ferrumequinum	3.7	8.1	7.1	18.9	28.7	5.7	5.4	39.9	6.1	12.5	4.7	0.3	1.7	9.5	11.5	6.4
R. hipposideros	2.2	8.1	5.5	13.9	29.9	5.5	4.4	39.8	7.3	13.9	6.6	0.7	1.8	9.9	12.0	5.8
R. euryale	2.9	12.5	4.8	20.2	30.8	3.8	11.5	46.2	2.9	4.8	6.7	–	2.9	7.7	10.6	8.7
R. mehelyi	–	17.2	17.2	34.5	10.3	3.5	17.2	31.0	–	–	3.5	–	10.3	17.2	27.6	3.5
R. blasii	–	6.7	3.3	10.0	40.0	1.7	3.3	45.0	8.3	5.0	5.0	–	3.3	15.0	18.3	8.3
M. myotis	4.9	7.6	6.0	18.5	33.7	4.4	8.2	46.2	5.4	13.6	3.3	1.1	1.1	8.7	10.9	2.2
M. blythii	0.9	8.6	6.9	16.4	31.0	4.3	8.6	44.0	6.0	19.0	4.3	0.9	1.7	–	2.6	7.8
M. bechsteinii	–	3.7	–	3.7	40.7	11.1	7.4	59.3	–	14.8	3.7	–	3.7	7.4	11.1	7.4
M. nattereri	–	2.9	2.9	5.9	29.4	–	2.9	32.4	2.9	35.3	17.6	–	–	2.9	2.9	2.9
M. emarginatus	–	13.9	4.2	18.1	23.6	6.9	6.9	37.5	1.4	16.7	6.9	–	4.2	4.2	8.3	8.3
*M. mystacinus**	–	–	18.2	18.2	–	–	–	–	9.1	45.5	18.2	–	–	–	–	9.1
M. aurascens	–	4.6	–	4.6	4.6	13.6	4.6	22.7	4.6	22.7	22.7	9.1	–	13.6	22.7	–
M. brandtii	–	–	–	–	28.6	28.6	–	57.1	–	42.9	–	–	–	–	–	–
M. daubentonii	–	16.7	11.1	27.8	13.9	13.9	8.3	36.1	8.3	5.6	2.8	–	–	2.8	2.8	16.7
M. dasycneme	–	100.0	–	100.0	–	–	–	–	–	–	–	–	–	–	–	–
M. capaccinii	3.8	17.7	7.6	29.1	32.9	5.1	–	38.0	3.8	6.3	2.5	–	3.8	10.1	13.9	6.3
V. murinus	–	–	21.7	21.7	13.0	13.0	–	26.1	13.0	34.8	4.4	–	–	–	–	–
E. serotinus	–	5.0	14.0	19.0	20.0	1.0	4.0	24.0	2.0	14.0	6.0	4.0	1.0	3.0	8.0	5.0
E. nilssonii	–	–	–	–	–	–	–	–	–	100.0	–	–	–	–	–	–
H. savii	–	4.5	4.5	9.0	26.9	9.0	6.0	41.8	6.0	14.9	17.9	–	–	6.0	6.0	4.5
P. pipistrellus s. l.	–	2.2	18.5	20.7	14.1	3.3	6.5	23.9	2.2	7.6	5.4	3.3	–	19.6	22.8	17.4
P. nathusii	–	1.7	39.3	46.4	–	–	–	–	14.3	3.6	3.6	7.1	3.6	7.1	17.9	14.3
P. kuhlii	–	–	–	–	–	–	–	–	–	–	55.6	–	–	–	–	44.4
N. noctula	–	8.7	29.3	38.0	12.0	4.4	7.6	23.9	7.6	5.4	2.2	5.4	1.1	5.4	12.0	10.1
N. leisleri	–	8.3	16.7	25.0	–	16.7	16.7	33.3	8.3	–	8.3	–	–	–	–	25.0
N. lasiopterus	–	–	9.1	9.1	–	–	–	–	9.1	18.2	18.2	–	–	9.1	9.1	36.4
B. barbastellus	–	4.4	–	4.4	13.0	21.7	4.4	39.1	–	34.8	4.4	4.4	–	4.4	8.7	8.7
P. auritus	–	–	–	–	21.4	17.9	3.6	42.9	7.2	46.5	–	–	–	–	–	3.6
P. austriacus	1.0	4.0	10.9	15.8	37.6	1.0	5.9	44.6	12.9	6.9	7.9	–	1.0	6.9	7.9	3.0
M. schreibersii	2.9	12.6	8.6	24.1	27.6	5.2	13.8	47.1	7.5	6.3	1.2	0.6	2.3	4.0	6.9	7.5
T. teniotis	–	–	–	–	–	–	–	–	–	30.0	20.0	–	–	50.0	50.0	–
total (% records)	1.9	8.0	9.0	18.9	26.0	5.3	6.6	38.4	6.0	12.8	5.9	1.1	1.8	7.8	10.7	7.2
total (% species)	25.8	74.2	71.0	83.9	74.2	74.2	67.7	77.4	74.2	87.1	87.1	35.5	48.4	71.0	74.2	80.6

* *M. mystacinus / alcathoe*

woodlands (the Balkan and Rila Massifs and adjacent karstic regions, the Mediterranean Struma and Mesta valleys); (II) Karstic lowlands and uplands (parts of the Danubian and Upper Thracian Lowlands, and the Eastern Balkan Mts.); and (III) The Black Sea region (incl. the Strandža Mts. and Ludogorie Plateau). The analysis has excluded two units, 1a and 6a, which are evidently the least investigated as regards the knowledge of bats: they account for a minimum number of bat records (in all, 3%) and a minimum number of species found (8 and 15 respectively), that is, always less than 50% of bat species known in Bulgaria.

In region (I), which comprises all important mountain systems in Bulgaria and some of the adjoining karstic regions, there are three clearly defined subgroups of biogeographic units (((2a+3)+(2b+4)+5)+6c), characterised not only by their bat faunae but also by their physical relief and vegetation. The pair of units (2b+4), that is, the highest parts of the mountain systems in Bulgaria (the Central Balkan and Predbalkan Mts. plus the south-western Bulgarian high mountains) is typical, above all, by the high percentage occurrence of central European boreal bat species and the accessory component of cave-dwelling bat species (*E. nilssonii* 100% records in Bulgaria, *M. brandtii* 71.5%, *P. auritus* 64.4%, *B. barbastellus* 56.5%, *V. murinus* 47.8%, *M. nattereri* 35.3%, *M.*

bechsteinii 25.9%, etc.; see Tab. 13). The pair of units (2a+3), including the Western Balkan and Predbalkan Mts. and the chain of mountains that surround the Sofia Basin, is typical by its well exploited karstic regions and thus the large number of records, totalling 32% of all bat records made in Bulgaria (Tab. 13). Typical of this region are both the boreal woodland and cave-dwelling Mediterranean species (*R. blasii* 48.3% of records in Bulgaria, *M. bechsteinii* 40.7%, *M. myotis* 39.1%, *M. blythii* 37.0%, *R. hipposideros* 37.2%, *M. capaccinii* 36.7%, *M. schreibersii* 35.1%, *R. ferrumequinum* 34.8%, *R. euryale* 33.7%, *M. nattereri* 32.3%, *M. brandtii* 28.6%, *P. auritus* 28.6%, *M. emarginatus* 25.0%, *M. daubentonii* 22.3%) but there also is a high percentage of rock and synanthropic species (*P. austriacus* 50.1%, *H. savii* 32.9%, *E. serotinus* 22%). The third and last part comprises two regions of Bulgaria (5+6c), denoted as Mediterranean or sub-Mediterranean and harbouring strictly Mediterranean fauna and vegetation. Of bats, there are, above all, *P. kuhlii* and *T. teniotis*, represented by 55.6 and 70% of Bulgarian records respectively. Also, there is a high percentage of some other species (*M. aurascens* 36.3%, *N. lasiopterus* 28.3%, *H. savii* 23.9%, *R. mehelyi* 20.7%, *M. nattereri* 20.5%, *R. blasii* 20.0%), of which only a part can be denoted as typically Mediterranean; on the other hand, the boreal species *M. brandtii* and *P. auritus* are absent. The presence of Mediterranean units (5+6c) in region (I) is evidently due to its geographic proximity to the high mountain systems of units (3+4) as well as to the fluent transition of some of the faunal elements: they share the exclusive Bulgarian occurrence of *T. teniotis* (100% of records) and there is a high percentage of records of *M. aurascens* (63.6%), *M. nattereri* (58.7%), *N. lasiopterus* (54.6%), *V. murinus* (52.2%), *H. savii* (44.8%), *B. barbastellus* (43.6%), *R. hipposideros* (37.7%), *P. pipistrellus* s. l. (34.8%), *R. blasii* (33.3%), that is, chiefly Mediterranean and rock faunal elements. Typical of the whole region (I), however, is the species composition of its bat fauna, paradoxically consisting of both woodland and strictly cave-dwelling elements.

Region (II) consists of three units ((1b+6b)+2c), all of which are deforested karstic regions lying north of the Central Predbalkan Mts. and in the eastern part of the Upper Thracian Lowland and mutually connected by a mosaic landscape of the Eastern Balkan Mts. This region is characterised by a rather small percentage of bat records (16.4%) composed of predominantly cave-dwelling bat species (*R. mehelyi* 44.7% of records in Bulgaria, *M. schreibersii* 28.7%, *R. euryale* 26.9%) and the absence of certain boreal or Mediterranean forms (*M. mystacinus* or *M. alcathoe*, *M. brandtii*, *V. murinus*, *P. kuhlii*). Moreover, the northernmost unit (1b) is characterised by a significant density of records of "water" forms of the genus *Myotis*: *M. dasycneme* (100%), *M. daubentonii* (16.7%), and *M. capaccinii* (17.7%). Most typical of the whole region (II) is the presence of strictly karstic faunal elements.

Region (III) comprises two units (1c+7) near the Black Sea coast, the lowlands of Dobrogea, and the Ludogorie Plateau and Strandža Mts. with the coast. The whole region is characterised by a high percentage of some dendrophilous species (*P. nathusii* 53.6% of records in Bulgaria, *N. lasiopterus* 45.5%, *N. leisleri* 41.7%, *N. noctula* 39.4%, *P. pipistrellus* s. l. 35.9%, *M. daubentonii* 27.8%, *M. mystacinus* or *M. alcathoe* 27.3%) and the absence or extremely low representation of others (*M. brandtii* 0%, *M. aurascens* 0%, *P. auritus* 3.6%, *B. barbastellus* 8.7%). Thus the whole region is dominated, first of all, by migratory species which apparently utilise this region during migrations from eastern Europe (cf. Strelkov 1969, 1971).

The territory of Bulgaria cannot be considered to have been sufficiently investigated, and only occasional records (in all, 4.8%) have been made particularly in its lowland regions (the western part of the Danubian Lowland and almost the whole of the Upper Thracian Lowland). This paucity of data does not allow effective comparison. Biogeographic comparisons of the remaining units have shown a similarity gradient of their faunae going across the traditional climatic and vegetation clustering in the N-S, or boreal-Mediterranean, direction. Such gradient is discernible, yet it is

no more than a secondary element. The division of the faunal regions exhibits an evident and strong primary W-E gradient which, apparently, is connected with the climatic and vegetation regions of the Balkans, and it certainly reflects the differences in the bat faunae caused by different phenological characteristics of the particular species and the corresponding landscape types.

In this contribution we present the hitherto known picture of all bat species known to occur on the territory of Bulgaria. However, this is only a partial stage of research into the Bulgarian bat fauna; it will be necessary to precise the ranges of some of the species by subsequent investigations.

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APPENDIX – GAZETTEER

B l a g o e v g r a d [Б л а г о е в г р а д]: Bansko, Bănderica hut [Банско, Бъндерица] (41° 49' N, 23° 28' E, 1810 m a. s. l.); – Bansko, Bănderica hut, Nišata cave [Банско, Бъндерица, Нишата] (41° 49' N, 23° 28' E, ca. 2000 m a. s. l.); – Bansko, Čalin Valog [Банско, Чалин валог] (41° 49' N, 23° 28' E, 1160 m a. s. l.); – Bansko, Vihrenskata Propast chasm [Банско, Вихренската пропаст] (41° 49' N, 23° 28' E, ca. 2500 m a. s. l.); – Belasica [Беласица] (41° 22' N, 23° 7' E, ca. 600 m a. s. l.); – Breznica [Брезница] (41° 40' N, 23° 40' E, 715 m a. s. l.); – Brežani [Брежани] (41° 52' N, 23° 10' E, 625 m a. s. l.); – General Todorov [Генерал Тодоров] (41° 28' N, 23° 16' E, ca. 100 m a. s. l.); – Goce Delčev [Гоце Делчев] (41° 34' N, 23° 43' E, 508 m a. s. l.); –

Golešovo, Stăršelica cave [Голешово, Стършелица] (41° 25’ N, 23° 36’ E, ca. 1200 m a. s. l.); – Gorna Breznica [Горна Брезница] (41° 45’ N, 23° 7’ E, 500 m a. s. l.); – Gospodinci [Господинци] (41° 38’ N, 23° 43’ E, ca. 600 m a. s. l.); – Ilindenci [Илинденци] (41° 38’ N, 23° 13’ E, 500 m a. s. l.); – Ilindenci, Šaralijskata Peštera cave [Илинденци, Шаралийската пещера] (41° 38’ N, 23° 13’ E, ca. 1700 m a. s. l.); – Kresna [Кресна] (41° 43’ N, 23° 8’ E, 230 m a. s. l.); – Kresna, Gara Pejo Javorov [Кресна, Гара Пейо Яворов] (41° 45’ N, 23° 8’ E, 240 m a. s. l.); – Kresna, Gara Stara Kresna [Кресна, Гара Стара Кресна] (41° 48’ N, 23° 10’ E, ca. 240 m a. s. l.); – Kresna, Šejtan Dere valley [Кресна, Шейтан дере] (41° 45’ N, 23° 8’ E, 240 m a. s. l.); – Leško [Лешко] (41° 55’ N, 22° 58’ E, ca. 580 m a. s. l.); – Liljanovo [Лиляново] (41° 37’ N, 23° 19’ E, 700 m a. s. l.); – Liljanovo, Popina Lăka [Лиляново, Попина лъка] (41° 40’ N, 23° 22’ E, 1400 m a. s. l.); – Melnik [Мелник] (41° 31’ N, 23° 23’ E, 450 m a. s. l.); – Novo Konomladi [Ново Кономлади] (41° 27’ N, 23° 19’ E, 150 m a. s. l.); – Petrič [Петрич] (41° 23’ N, 23° 11’ E, 200 m a. s. l.); – Ploski [Плоски] (41° 38’ N, 23° 16’ E, 630 m a. s. l.); – Ploski, Zandana cave [Плоски, Зандана пещера] (41° 38’ N, 23° 16’ E, ca. 600 m a. s. l.); – Razlog, Meča Dupka cave [Разлог, Меча дупка] (41° 52’ N, 23° 28’ E, ca. 800 m a. s. l.); – Razlog, Propadnalata Peštera cave [Разлог, Пропадналата пещера] (41° 52’ N, 23° 28’ E, ca. 800 m a. s. l.); – Ribnovo, Manuilovata Peštera cave [Рибново, Мануиловата пещера] (41° 43’ N, 23° 46’ E, ca. 1200 m a. s. l.); – Rožen [Рожен] (41° 31’ N, 23° 25’ E, 500 m a. s. l.); – Rožen, Roženski monastery [Рожен, Роженски манастир] (41° 32’ N, 23° 26’ E, 550 m a. s. l.); – Rupite [Рупите] (41° 25’ 6 N, 23° 15’ E, ca. 150 m a. s. l.); – Sandanski [Сандански] (41° 34’ N, 23° 16’ E, 300 m a. s. l.); – Vlahi [Влахи] (41° 43’ N, 23° 13’ E, 770 m a. s. l.). – B u r g a s [Б у р г а с]: Ahtopol [Ахтопол] (42° 6’ N, 27° 56’ E, 0 m a. s. l.); – Bilka, Goljam Kamăk hill [Билка, Голям камък] (42° 55’ N, 27° 13’ E, 260 m a. s. l.); – Brăšljan [Бръшлян] (42° 2’ N, 27° 25’ E, 360 m a. s. l.); – Burgas [Бургас] (42° 30’ N, 27° 28’ E, 30 m a. s. l.); – Burgas, Vaja lake [Бургас, Вая] (42° 30’ N, 27° 28’ E, 30 m a. s. l.); – Carevo [Царево] (42° 10’ N, 27° 51’ E, 0 m a. s. l.); – Černomorec [Черноморец] (42° 27’ N, 27° 38’ E, 0 m a. s. l.); – Černomorec, Nos Atija cape [Черноморец, Нос Атия] (42° 27’ N, 27° 38’ E, 0 m a. s. l.); – Dobromir [Добромир] (42° 57’ N, 27° 18’ E, 300 m a. s. l.); – Gramatikovo, Kačul, Veleka river [Граматиково, Качул, р. Велека] (42°3’ N, 27° 38’ E, 300 m a. s. l.); – Grudovo [Грудово] (42° 21’N, 27° 10’ E, 40 m a. s. l.); – Izgrev [Изгрев] (42° 8’ N, 27° 48’ E, 130 m a. s. l.); – Kalovo, Mladežka river [Калово, Младежка река] (42° 7’N, 27° 31’ E, 300 m a. s. l.); – Kiten [Китен] (42° 13’ N, 27° 46’ E, 0 m a. s. l.); – Kosti, Maharata cave [Кости, Махарата] (42° 4’N, 27° 46’ E, ca. 200 m a. s. l.); – Malko Tărnovo [Малко Търново] (41° 58’ N, 27° 31’ E, 350 m a. s. l.); – Malko Tărnovo, Bratanovskata Peštera cave [Малко Търново, Братановската пещера] (42° 00’ N, 27° 28’ E, ca. 400 m a. s. l.); – Malko Tărnovo, Goljamata Vitanovska Peštera cave [Малко Търново, Голямата Витановска пещера] (41° 58’ N, 27° 31’ E, ca. 350 m a. s. l.); – Malko Tărnovo, Malkata Vitanovska Peštera cave [Малко Търново, Малката Витановска пещера] (41° 58’ N, 27° 31’ E, ca. 350 m a. s. l.); – Mičurin [Мичурин] (= Carevo [Царево]) (42° 10’ N, 27° 51’ E, 0 m a. s. l.); – Mladežko [Младежко] (42° 8’ N, 27° 22’ E, 340 m a. s. l.); – Mladežko, Ezeroto cave [Младежко, Езерото] (42° 8’ N, 27° 22’ E, ca. 350 m a. s. l.); – Mladežko, Kaleto cave [Младежко, Калето] (42° 8’ N, 27° 22’ E, ca. 400 m a. s. l.); – Mladežko, Lejarnicite cave [Младежко, Леярниците] (42° 8’ N, 27° 22’ E, ca. 400 m a. s. l.); – Primorsko, Arkutino [Приморско, Аркутино] (42° 16’ N, 27° 46’ E, 0 m a. s. l.); – Primorsko, Arkutino, Solenka area [Приморско, Аркутино, Соленка] (42° 16’ N, 27° 46’ E, 50 m a. s. l.); – Primorsko, Maslen Nos cape, Karaul Taš [Приморско, Маслен нос, Караул таш] (42° 16’ N, 27° 46’ E, 50 m a. s. l.); – Primorsko, Maslen Nos cape, Tjulenovata Peštera cave [Приморско, Маслен нос, Тюленовата пещера] (42° 16’ N, 27° 46’ E, 0 m a. s. l.); – Primorsko, Perla [Приморско, Перла] (42° 16’ N, 27° 46’ E, 0 m a. s. l.); – Rakovskovo [Раковсково] (42° 49’ N, 27° 45’ E, 60 m a. s. l.); – Ropotamo reserve [резерват Ропотамо] (42° 20’ N, 27° 60’ E, 10 m a. s. l.); – Ropotamo river estuary [р. Ропотамо] (42° 20’ N, 27° 60’ E, 0 m a. s. l.); – Sozopol [Созопол] (42° 25’ N, 27° 41’ E, 0 m a. s. l.); – Stoilovo, Dokuzak river [Стоилово, р. Докузак] (42° 1’ N, 27° 31’ E, 300 m a. s. l.); – Zvezdec [Звездец] (42° 7’ N, 27° 25’ E, ca. 350 m a. s. l.); – Zvezdec, Petrova Niva, Goljamata Văpa cave [Звездец, Петрова нива, Голямата въпа] (42° 7’ N, 27° 25’ E, ca. 350 m a. s. l.); – Zvezdec, Parnarot cave [Звездец, Парнарот] (42° 7’ N, 27° 25’ E, ca. 350 m a. s. l.); – Zvezdec, Veleka river [Звездец, р. Велека] (42° 7’ N, 27° 25’ E, ca. 300 m a. s. l.). – D o b r i č [Д о б р и ч]: Albena [Албена] (43° 21’ N, 28° 5’ E, 0 m a. s. l.); – Durankulak [Дуранкулак] (43° 42’ N, 28° 31’ E, 30 m a. s. l.); – Kamen Brjag [Камен бряг] (43° 27’ N, 28° 33’ E, 10 m a. s. l.); – Kamen Brjag, Jajlata [Камен бряг, Яйлата] (43° 27’ N, 28° 33’ E, 10 m a. s. l.); – Kavarna [Каварна] (43° 25’ N, 28° 19’ E, 120 m a. s. l.); – Tjulenovo [Тюленово] (43° 28’ N, 28° 34’ E, 0 m a. s. l.); – Sveti Nikola, Bolata [Свети Никола, Болата] (43° 25’ N, 28° 30’ E, 100 m a. s. l.); – Sveti Nikola, Bolata, Humbata cave [Свети Никола, Болата, Хумбата] (43° 25’ N, 28° 30’ E, 100 m a. s. l.); – Sveti Nikola, Tauk Liman [Свети Никола, Таук Лиман] (43° 25’ N, 28° 30’ E, 100 m a. s. l.). – G a b r o v o [Г а б р о в о]: Armenite, Černata Peštera cave [Армените, Черната пещера] (42° 55’ N, 25° 13’ E, 350 m a. s. l.); – Drjanovo, Andăka cave [Дряново, Андъка] (42° 58’ N, 25° 28’ E, ca. 450 m a. s. l.); – Drjanovo, Bačo Kiro cave [Дряново, Бачо Киро] (42° 58’ N, 25° 28’ E, ca. 450 m a. s. l.); – Jantra, Izvora cave [Янтра, Извора] (43° 12’ N, 25° 4’ E, ca. 150 m a. s. l.); – Jantra, Prilepnata Peštera cave [Янтра, Прилепната пещера] (43° 12’ N, 25° 4’ E, ca. 150 m a. s. l.); – Skalsko, Rosica river [Скалско, р.

Росица] (42° 58’ N, 25° 22’ E, 500 m a. s. l.). – H a s k o v o [Х а с к о в о]: Beli Dol [Бели дол] (41° 25’ N, 25° 56’ E, ca. 200 m a. s. l.); – Bjal Kladenec, Goljamata Peštera cave [Бял кладенец, Голямата пещера] (41° 38’ N, 25° 37’ E, 350 m a. s. l.); – Bjal Kladenec, Karadžainler cave [Бял кладенец, Караджаинлер] (41° 38’ N, 25° 37’ E, 300 m a. s. l.); – Bjal Kladenec, Malkata Peštera cave [Бял кладенец, Малката пещера] (41° 38’ N, 25° 37’ E, 300 m a. s. l.); – Dăbovec, Arda river [Дъбовец, р. Арда] (41° 40’ N, 26° 0’ E, ca. 200 m a. s. l.); – Dolno Čerkovište, Zandana cave [Долно Черковище, Зандана] (41° 37’ N, 25° 45’ E, 300 m a. s. l.); – Dolno Lukovo, Bjala Reka river [Долно Луково, Бяла река] (41° 22’ N, 26° 4’ E, 100 m a. s. l.); – Gaberovo, Gjurgen Dere [Габерово, Гюрген дере] (41° 37’ N, 25° 55’ E, 500 m a. s. l.); – Harmanli [Харманли] (41° 55’ N, 25° 53’ E, 60 m a. s. l.); – Knižovnik [Книжовник] (41° 49’ N, 25° 36’ E, 180 m a. s. l.); – Kostilkovo [Костилково] (41° 25’ N, 26° 3’ E, 340 m a. s. l.); – Lozen [Лозен] (41° 47’ N, 26° 1’ E, 200 m a. s. l.); – Madžarovo [Маджарово] (41° 37’ N, 25° 52’ E, 200 m a. s. l.); – Meden Buk, Bjala Reka river [Меден Бук, Бяла река] (41° 22’ N, 26° 1’ E, 100 m a. s. l.); – Meden Buk, Žălti Čal [Меден Бук, Жълти чал] (41° 21’ N, 26° 0’ E, 400 m a. s. l.); – Spahievo, Aida hill [Спахиево, Аида] (41° 53’ N, 25° 19’ E, 400 m a. s. l.); – Svetoslav [Светослав] (41° 38’ N, 25° 38’ E, 260 m a. s. l.); – Svilengrad [Свиленград] (41° 46’ N, 26° 11’ E, 50 m a. s. l.). – J a m b o l [Я м б о л]: Krajnovo, Dălbokata Dupka cave [Крайново, Дълбоката дупка] (42° 1’ N, 26° 52’ E, ca. 400 m a. s. l.); – Lesovo [Лесово] (41° 58’ N, 26° 34’ E, 300 m a. s. l.); – Melnica, Kesedžijca cave [Мелница, Кеседжийца] (42° 2’ N, 26° 34’ E, 200 m a. s. l.); – Melnica, Suhata Drănči Dupka cave [Мелница, Сухата Дрънчи дупка] (42° 2’ N, 26° 34’ E, 200 m a. s. l.); – Melnica, Vodnata Drănči Dupka cave [Мелница, Водната Дрънчи дупка] (42° 2’ N, 26° 34’ E, 200 m a. s. l.); – Ustrem [Устрем] (42° 1’ N, 26° 28’ E, 100 m a. s. l.); – Ustrem, Bozkite cave [Устрем, Бозките] (42° 1’ N, 26° 28’ E, 100 m a. s. l.); – Ustrem, Sveta Troica monastery [Устрем, манастир Света Троица] (42° 1’ N, 26° 28’ E, 100 m a. s. l.). – K ă r d ž a l i [К ъ р д ж а л и]: Belopoljane, Belopoljanskata Peštera cave [Белополяне, Белополянската пещера] (41° 27’ N, 26° 8’ E, 200 m a. s. l.); – Bjal Izvor, Džin Gugu cave [Бял извор, Джин Гугу] (41° 32’ N, 25° 4’ E, 600 m a. s. l.); – Bjala Poljana, Manaf-Kojusju cave [Бяла Поляна, Манаф-Коюсю] (41° 40’ N, 25° 37’ E, 400 m a. s. l.); – Daždovnica, Hasarskata Peštera cave [Дъждовница, Хасарската пещера] (41° 40’ N, 25° 18’ E, 400 m a. s. l.); – Egrek, Rupata cave [Егрек, Рупата] (41° 19’ N, 25° 37’ E, ca. 450 m a. s. l.); – Gugutka, Čukurska Reka river [Гугутка, Чукурска река] (41° 25’ N, 25° 55’ E, 200 m a. s. l.); – Huhla, Ivajlovgrad dam [Хухла, язовир Ивайловград] (41° 34’ N, 26° 6’ E, 80 m a. s. l.); – Ivajlovgrad [Ивайловград] (41° 31’ N, 26° 7 E, 180 m a. s. l.); – Ivajlovgrad, Dupkata cave [Ивайловград, Дупката] (41° 31’ N, 26° 7 E, 350 m a. s. l.); – Kobiljane, Vodnata Peštera cave [Кобиляне, Водната пещера] (41° 36’ N, 25° 16’ E, 580 m a. s. l.); – Kremen [Кремен] (41° 19’ N, 25° 21’ E, 500 m a. s. l.); – Mădrec, Maarata cave [Мъдрец, Маарата] (41° 42’ N, 25° 31’ E, 400 m a. s. l.); – Momčilgrad [Момчилград] (41° 31’ N, 25° 25’ E, 450 m a. s. l.); – Momčilgrad, Momčil hut [Момчилград, хижа Момчил] (41° 31’ N, 25° 25’ E, 340 m a. s. l.); – Orešari, Gouk-In cave [Орешари, Гоук-ин] (41° 36’ N, 25° 45’ E, 380 m a. s. l.); – Orešari, Karangin cave [Орешари, Карангин] (41° 36’ N, 25° 45’ E, 380 m a. s. l.); – Ribino, Ajna-Ini cave [Рибино, Айна-Ини] (41° 22’ N, 25° 31’ E, 400 m a. s. l.); – Ribino, Brăšljanovata Peštera cave [Рибино, Бръшляновата пещера] (41° 22’ N, 25° 31’ E, 400 m a. s. l.); – Ribino, Kondžalar cave [Рибино, Конджалар] (41° 22’ N, 25° 31’ E, 400 m a. s. l.); – Ribino, Prilepnata Peštera cave [Рибино, Прилепната пещера] (41° 22’ N, 25° 31’ E, 400 m a. s. l.); – Ribino, Samara cave [Рибино, Самара] (41° 22’ N, 25° 31’ E, 410 m a. s. l.); – Široko Pole, Karangil cave [Широко поле, Карангил] (41° 37’ N, 25° 28’ E, 250 m a. s. l.); – Stražec [Стражец] (41° 22’ N, 25° 52’ E, 440 m a. s. l.); – Stremci [Стремци] (41° 43’ N, 25° 25’ E, 350 m a. s. l.); – Studen Kladenec [Студен Кладенец] (41° 36’ N, 25° 38’ E, 200 m a. s. l.); – Tărnovci [Търновци] (41° 30’ N, 25° 15’ E, 400 m a. s. l.); – Tărnovci, Karaguk cave [Търновци, Карагук] (41° 30’ N, 25° 15’ E, 400 m a. s. l.); – Tatul [Тутул] (41° 32’ N, 25° 33’ E, ca. 400 m a. s. l.); – Visoka Poljana, Jarasă-Ini cave [Висока Поляна, Ярасъ-Ини] (41° 40’ N, 25° 31’ E, 400 m a. s. l.); – Visoka Poljana, Gjumbjurdek Ini cave [Висока Поляна, Гюмбюрдек Ини] (41° 40’ N, 25° 31’ E, 450 m a. s. l.). – K j u s t e n d i l [К ю с т е н д и л]: Gorna Koznica, Asandelija cave [Горна Козница, Асанделия] (42° 19’ N, 22° 55’ E, ca. 1000 m a. s. l.); – Kjustendil [Кюстендил] (42° 16’ N, 22° 40’ E, 500 m a. s. l.); – Liljač [Лиляч] (42° 16’ N, 22° 52’ E, 840 m a. s. l.); – Osogovska Mts. [Осоговска планина] (ca. 42° 10’ N, 22° 31’ E); – Pančarevo [Панчарево] (42° 36’ N, 23° 25’ E, 840 m a. s. l.); – Pastra, Elešnica [Пастра, Елешница] (42° 7’ N, 23° 13’ E, 1250 m a. s. l.); – Rilski Manastir, Kirilova Poljana, gallery [Рилски манастир, Кирилова поляна, галерия] (42° 09’ N, 23° 25’ E, ca. 1600 m a. s. l.); – Rilski Manastir, Kirilova Poljana, tunnel [Рилски манастир, Кирилова поляна, тунел] (42° 09’ N, 23° 25’ E, ca. 1510 m a. s. l.); – Rilski Manastir, Ilijna Reka river, Kravarski Dol [Рилски манастир, Илийна река, Краварски дол] (42° 06’ N, 23° 20’ E, ca. 1050 m a. s. l.); – Rilski Manastir, Ilijna Reka river, building [Рилски манастир, Илийна река, постройка] (42° 06’ N, 23° 20’ E, ca. 1420 m a. s. l.); – Rilski Manastir, Ilijna Reka river, gallery [Рилски манастир, Илийна река, галерия] (42° 06’ N, 23° 20’ E, ca. 1550 m a. s. l.); – Rilski

Manastir, Ribni Ezera hut [Рилски манастир, хижа Рибни езера] (42° 8’ N, 23° 28’ E, ca. 2250 m a. s. l.); – Stradalovo, Lisiča Dupka cave [Страдалово, Лисича дупка] (42° 7’ N, 22° 43’ E, 750 m a. s. l.); – Trekljano [Трекляно] (42° 32’ N, 22° 36’ E, 750 m a. s. l.); – Trekljano, Jamkata cave [Трекляно, Ямката] (42° 32’ N, 22° 36’ E, ca. 750 m a. s. l.); – Vetren, Goljamata Peštera cave [Ветрен, Голямата пещера] (42° 2’ N, 22° 45’ E, ca. 1000 m a. s. l.). – L o v e č [Л о в е ч]: Aprilci, Pleven hut [Априлци, хижа Плевен] (42° 49’ N, 24° 55’ E, 1500 m a. s. l.); – Aprilci, Pleven hut, Vodnite Dupki cave [Априлци, хижа Плевен, Водните дупки] (42° 49’ N, 24° 55’ E, 1400 m a. s. l.); – Bežanovo, Parnicite cave (= Dolen Parnik) [Бежаново, Парниците (= Долен парник)] (43° 13’ N, 24° 23’ E, 180 m a. s. l.); – Brestnica, Săeva Dupka cave [Брестница, Съева дупка] (43° 4’ N, 24° 10’ E, 300 m a. s. l.); – Čavdarci, Mandrata cave [Чавдарци, Мандрата] (43° 15’ N, 25° 0’ E, 200 m a. s. l.); – Černi Osăm, Rajčova Dupka cave [Черни Осъм, Райчова дупка] (42° 49’ N, 24° 45’ , ca. 1400 m a. s. l.); – Černi Osăm, Smesite [Черни Осъм, Смесите] (42° 49’ N, 24° 45’ , ca. 700 m a. s. l.); – Černi Osăm, Steneto reserve, Kumanica river [Черни Осъм, резерват Стенето, р. Куманица] (42° 49’ N, 24° 45’ E, ca. 800 m a. s. l.); – Čiflik, Hajduška Pesen hut [Чифлик, хижа Хайдушка песен] (42° 55’ N, 24° 40’ E, 750 m a. s. l.); – Devetaki, Devetaškata Peštera cave [Деветаки, Деветашката пещера] (43° 13’ N, 24° 53’ E, 250 m a. s. l.); – Divčovoto, Boroveška Dupka cave [Дивчовото, Боровешка дупка] (42° 49’ N, 24° 13’ E, 950 m a. s. l.); – Divčovoto, Graždenica cave [Дивчовото, Гражденица] (42° 49’ N, 24° 13’ E, 800 m a. s. l.); – Dragana, Skoka cave [Драгана, Скока] (43° 10’ N, 24° 22’ E, 300 m a. s. l.); – Gložene [Гложене] (42° 58’ N, 24° 10’ E, 420 m a. s. l.); – Gložene, Ljastovicata cave [Гложене, Лястовицата] (42° 58’ N, 24° 10’ E, 450 m a. s. l.); – Gložene, Morovica cave [Гложене, Моровица] (42° 58’ N, 24° 10’ E, ca. 600 m a. s. l.); – Gložene, Partizanskata Peštera cave [Гложене, Партизанската пещера] (42° 58’ N, 24° 10’ E, 450 m a. s. l.); – Goljama Željazna, Toplja cave [Голяма Желязна, Топля] (42° 58’ N, 24° 28’ E, 502 m a. s. l.); – Gradežnica, Malkata Peštera cave [Градежница, Малката пещера] (43° 1’ N, 24° 13’ E, 550 m a. s. l.); – Karlukovo [Карлуково] (43° 11’ N, 24° 4’ E, 250 m a. s. l.); – Karlukovo, Bankovica cave [Карлуково, Банковица] (43° 10’ N, 24° 4’ E, 250 m a. s. l.); – Karlukovo, Bezimenna cave [Карлуково, Безименна] (43° 10’ N, 24° 4’ E, 250 m a. s. l.); – Karlukovo, Bezimenna 22 cave [Карлуково, Безименна 22] (43° 10’ N, 24° 4’ E, 250 m a. s. l.); – Karlukovo, Čerdženica cave [Карлуково, Чердженица] (43° 10’ N, 24° 4’ E, 250 m a. s. l.); – Karlukovo, Dvoevratica cave [Карлуково, Двоевратица] (43° 10’ N, 24° 4’ E, 250 m a. s. l.); – Karlukovo, Imaneto cave [Карлуково, Имането] (43° 10’ N, 24° 4’ E, 250 m a. s. l.); – Karlukovo, Mandrata cave [Карлуково, Мандрата] (43° 10’ N, 24° 4’ E, 250 m a. s. l.); – Karlukovo, Ovnarka cave, Zadănen Dol [Карлуково, Овнарка, Задънен дол] (43° 10’ N, 24° 4’ E, 250 m a. s. l.); – Karlukovo, Prohodna cave [Карлуково, Проходна] (43° 10’ N, 24° 4’ E, 250 m a. s. l.); – Karlukovo, Temnata Dupka cave [Карлуково, Темната дупка] (43° 10’ N, 24° 4’ E, 250 m a. s. l.); – Karlukovo, Troevratica cave [Карлуково, Троевратица] (43° 10’ N, 24° 4’ E, 250 m a. s. l.); – Karlukovo, Zadănenka cave, Zadănen Dol [Карлуково, Задъненка, Задънен дол] (43° 10’ N, 24° 4’ E, 250 m a. s. l.); – Kărpačevo, Fut’ovskata Peštera cave [Кърпачево, Футьовската пещера] (43° 13’ N, 25° 1’ E, 400 m a. s. l.); – Krušuna, Boninskata Peštera cave [Крушуна, Бонинската пещера] (43° 15’ N, 25° 1’ E, 250 m a. s. l.); – Krušuna, Uruška Maara cave [Крушуна, Урушка маара] (43° 15’ N, 25° 1’ E, 220 m a. s. l.); – Mikre, Goljamata Mikrenska Peštera cave [Микре, Голямата Микренска пещера] (43° 1’ N, 24° 31’ E, 450 m a. s. l.); – Mikre, Malkata Mikrenska Peštera cave [Микре, Малката Микренска пещера] (43° 1’ N, 24° 31’ E, 450 m a. s. l.); – Ribarica, Vežen hut [Рибарица, хижа Вежен] (42° 45’ N, 24° 23’ E, 1650 m a. s. l.); – Tepava, Kănčova Vărpina cave [Тепава, Кънчова върпина] (43° 10’ N, 24° 53’ E, 350 m a. s. l.); – Trojan, Zmejova Dupka cave, Hitrovci [Троян, Змейова дупка, Хитровци] (42° 52’ N, 24° 43’ E, 500 m a. s. l.); – Zlatna Panega, Dolnata Peštera cave [Златна Панега, Долната пещера] (43° 4’ N, 24° 8’ E, 350 m a. s. l.); – Zlatna Panega, Gornata Peštera cave [Златна Панега, Горната пещера] (43° 4’ N, 24° 8’ E, 350 m a. s. l.); – Zlatna Panega, Panežka (= Izvora) cave [Златна Панега, Панежка (= Извора)] (43° 6’ N, 24° 8’ E, 350 m a. s. l.). – M o n t a n a [М о н т а н а]: Belimel, Parasinskata Propast chasm [Белимел, Парасинската пропаст] (43° 25’ N, 22° 58’ E, 260 m a. s. l.); – Gorna Bela Rečka [Горна Бела речка] (43° 10’ N, 23° 22’ E, ca. 800 m a. s. l.); – Gorna Luka, Mišin Kamăk cave [Горна лука, Мишин камък] (43° 27’ N, 22° 53’ E, 400 m a. s. l.); – Gorna Luka, Suhi Peč cave [Горна Лука, Сухи печ] (43° 27’ N, 22° 53’ E, 450 m a. s. l.); – Gorna Luka, Vodni Peč cave [Горна Лука, Водни печ] (43° 27’ N, 22° 53’ E, 400 m a. s. l.); – Mitrovci, Goljamata Mitrovska Peštera cave [Митровци, Голямата Митровска пещера] (43° 25’ N, 22° 55’ E, 400 m a. s. l.); – Prevala, Vreloto cave [Превала, Врелото] (43° 28’ N, 22° 52’ E, ca. 500 m a. s. l.). – P a z a r d ž i k [П а з а р д ж и к]: Batak [Батак] (41° 57’ N, 24° 13’ E, 1050 m a. s. l.); – Batak, Cigov Čark [Батак, Цигов чарк] (41° 58’ N, 24° 9’ E, 1050 m a. s. l.); – Gabrovica, Golaškata Peštera cave [Габровица, Голашката пещера] (42° 17’ N, 23° 56’ E, ca. 700 m a. s. l.); – Pazardžik [Пазарджик] (42° 12’ N, 24° 19’ E, 200 m a. s. l.); – Peštera [Пещера] (42° 1’ N, 24° 18’ E, 430 m a. s. l.); – Peštera, Lilova Skala cave [Пещера, Лилова скала] (42° 1’N, 24° 18’ E, 450 m a. s. l.); – Peštera, Novata Peštera cave [Пещера, Новата пещера] (42° 1’ N, 24° 17’ E, 500 m a. s. l.); – Peštera, Snežanka cave [Пещера, Снежанка] (42° 0’ N, 24° 16’ E, 500 m a. s. l.); – Peštera, Ušatovi Dupki cave [Пещера, Ушатови дупки] (42° 1’N, 24° 18’ E, 500 m a. s. l.); – Peštera, Vodnata Peštera cave [Пещера,

Водната пещера] (42° 1’N, 24° 18’ E, 500 m a. s. l.); – Sărnica, Dospat dam [Сърница, язовир Доспат] (41° 43’ N, 24° 1’ E, 1210 m a. s. l.); – Velingrad [Велинград] (42° 1’ N, 24° 0’ E, 800 m a. s. l.); – Velingrad, Lepenica cave [Велинград, Лепеница] (42° 2’ N, 23° 53’ E, ca. 1000 m a. s. l.); – Velingrad, Suhata Peštera cave [Велинград, Сухата пещера] (42° 1’ N, 24° 0’ E, ca. 1100 m a. s. l.). – P e r n i k [П е р н и к]: Pernik [Перник] (42° 36’ N, 23° 1’ E, 760 m a. s. l.); – Rajanci, Jamkite cave [Раянци, Ямките] (42° 31’ N, 22° 40’ E, 750 m a. s. l.); – Studena [Студена] (42° 31’ N, 23° 7’ E, 880 m a. s. l.). – P l e v e n [П л е в е н]: Bohot, Kirov Vărtop cave [Бохот, Киров вртоп] (43° 19’ N, 24° 41’ E, ca. 350 m a. s. l.); – Brăšljanica [Бръшляница] (43° 32’ N, 24° 43’ E, 130 m a. s. l.); – Debovo, bridge on the road Debovo–Ljubenovo [Дебово] (43° 34’ N, 24° 52’ E, 30 m a. s. l.); – Devenci, Hajduška Peštera cave [Девенци, Хайдушка пещера] (43° 19’ N, 24° 10’ E, 150 m a. s. l.); – Dolna Mitropolija, Vit river [Долна Митрополия, р. Вит] (43° 28’ N, 24° 31’ E, 50 m a. s. l.); – Muselievo [Муселиево] (43° 37’ N, 24° 51’ E, 130 m a. s. l.); – Muselievo, Nanin Kamăk cave (= cave No. 420) [Муселиево, Нанин камък] (43° 37’ N, 24° 51’ E, 150 m a. s. l.); – Muselievo, Osăm river [Муселиево, р. Осъм] (43° 37’ N, 24° 51’ E, 130 m a. s. l.); – Pleven [Плевен] (43° 25’ N, 24° 37’ E, 120 m a. s. l.); – Pleven, park Kajlăka [Плевен, парк Кайлъка] (43° 25’ N, 24° 37’ E, 120 m a. s. l.); – Rakita, Sedlarkata cave [Ракита, Седларката] (43° 16’ N, 24° 16’ E, 250 m a. s. l.); – Reselec [Реселец] (43° 13’ N, 24° 1’ E, 200 m a. s. l.); – Reselec, Temnata Dupka cave [Реселец, Темната дупка] (43° 13’ N, 24° 1’ E, 200 m a. s. l.); – Sadovec, Gininata Peštera cave [Садовец, Гинината пещера] (43° 16’ N, 24° 16’ E, 250 m a. s. l.); – Sanadinovo [Санадиново] (43° 31’ N, 25° 1’ E, 50 m a. s. l.); – Somovit [Сомовит] (43° 40’ N, 24° 46’ E, 200 m a. s. l.); – Žernov [Жернов] (43° 38’ N, 24° 51’ E, 150 m a. s. l.). – P l o v d i v [П л о в д и в]: Bačkovo [Бачково] (41° 57’ N, 24° 52’ E, ca. 950 m a. s. l.); – Bačkovo, Bačkovski monastery [Бачково, Бачковски манастир] (41° 56’ N, 24° 51’ E, 712 m a. s. l.); – Bačkovo, Marciganica [Бачково, Марциганица] (41° 53’ N, 24° 55’ E, 1400 m a. s. l.); – Dobrostan, Ahmet’ova Dupka cave [Добростан, Ахметьова дупка] (41° 53’ N, 24° 55’ E, 1400 m a. s. l.); – Dobrostan, Ivanova Voda cave [Добростан, Иванова вода] (41° 53’ N, 24° 55’ E, 1350 m a. s. l.); – Dobrostan, Topčika cave [Добростан, Топчика] (41° 53’ N, 24° 55’ E, 1350 m a. s. l.); – Hristo Danovo, Damla Dere [Христо Даново, Дамла дере] (42° 43’ N, 24° 36’ E, 780 m a. s. l.); – Hristo Danovo, Vodnata Peštera cave [Христо Даново, Водната пещера] (42° 43’ N, 24° 36’ E, 800 m a. s. l.); – Hristo Danovo, Zlatnata Peštera cave [Христо Даново, Златната пещера] (42° 43’ N, 24° 36’ E, 800 m a. s. l.); – Kalofer, Raj hut, Han Maara cave [Калофер, хижа Рай, Хан маара] (42° 37’ N, 24° 58’ E, 1600 m a. s. l.); – Kalofer, Raj hut, Rogačevata cave [Калофер, хижа Рай, Рогачевата] (42° 37’ N, 24° 58’ E, 1700 m a. s. l.); – Kărnare, Mazata cave [Кърнаре, Мазата] (42° 42’ N, 24° 37’ E, 1350 m a. s. l.); – Kričim [Кричим] (42° 2’ N, 24° 28’ E, 250 m a. s. l.); – Mostovo, Gargina Dupka cave [Мостово, Гаргина дупка] (41° 51’ N, 24° 56’ E, ca. 1000 m a. s. l.); – Mostovo, Zmiin Borun cave [Мостово, Змиин борун] (41° 51’ N, 24° 56’ E, ca. 1000 m a. s. l.); – Peruštica [Перущица] (42° 2’ N, 24° 33’ E, ca. 480 m a. s. l.); – Plovdiv [Пловдив] (42° 8’ N, 24° 45’ E, 160 m a. s. l.). – R a z g r a d [Р а з г р а д]: Krivnja, Božkova Dupka cave [Кривня, Божкова дупка] (43° 38’ N, 26° 19’ E, 190 m a. s. l.); – Seslav, Kaca Peštera cave [Сеслав, Каца пещера] (43° 52’ N, 26° 22’ E, 130 m a. s. l.); – Suševo [Сушево] (43° 49’ N, 26° 37’ E, 220 m a. s. l.); – Voden [Воден] (43° 40’ N, 26° 40’ E, 200 m a. s. l.). – R u s e [Р у с е]: Beljanovo [Беляново] (43° 37’ N, 25° 37’ E, 100 m a. s. l.); – Červen [Червен] (43° 37’ N, 26° 1’ E, 200 m a. s. l.); – Červen, Zorovica cave [Червен, Зоровица] (43° 37’ N, 26° 1’ E, 250 m a. s. l.); – Krasen, Găbarnika cave [Красен, Гъбарника] (43° 37’ N, 26° 1’ E, 110 m a. s. l.); – Krivina, Dunav river [Кривина, р. Дунав] (43° 37’ N, 25° 34’ E, 80 m a. s. l.); – Nikolovo, park Teketo [Николово, парк Текето] (43° 51’ N, 26° 6’ E, 120 m a. s. l.); – Nisovo [Нисово] (43° 51’ N, 26° 6’ E, 120 m a. s. l.); – Novo Selo [Ново село] (43° 47’ N, 26° 10’ E, 140 m a. s. l.); – Pepelina [Пепелина] (43° 34’ N, 25° 55’ E, 120 m a. s. l.); – Pepelina, Orlova Čuka cave [Пепелина, Орлова чука] (43° 34’ N, 25° 55’ E, 150 m a. s. l.); – Pisanec [Писанец] (43° 40’ N, 26° 10’ E, 120 m a. s. l.); – Pisanec, Bataklijata [Писанец, Батаклията] (43° 40’ N, 26° 10’ E, 150 m a. s. l.); – Pisanec, Goljamata Peštera cave [Писанец, Голямата пещера] (43° 40’ N, 26° 10’ E, 120 m a. s. l.); – Ruse [Русе] (43° 49’ N, 25° 56’ E, 90 m a. s. l.); – Ruse, Lom river estuary [Русе, р. Лом] (43° 49’ N, 25° 56’ E, 90 m a. s. l.); – Ruse, Obrazcov Čiflik [Русе, Образцов Чифлик] (43° 49’ N, 25° 56’ E, 90 m a. s. l.); – Ruse, Sredna Kula [Русе, Средна Кула] (43° 47’ N, 25° 56’ E, 70 m a. s. l.); – Svalenik, Bjalata Stena cliff [Сваленик, Бялата стена] (43° 34’ N, 26° 7’ E, 160 m a. s. l.). – S i l i s t r a [С и л и с т р а]: Balik [Балик] (43° 47’ N, 27° 34’ E, ca. 180 m a. s. l.); – Balik, Sandăk Peštera cave [Балик, Сандък пещера] (43° 47’ N, 27° 34’ E, ca. 180 m a. s. l.); – Nova Černa [Нова Черна] (43° 58’ N, 26° 28’ E, 40 m a. s. l.); – Nova Černa, Kalimok biological station [Нова Черна, Калимок] (44° 1’ N, 26° 30’ E, 5 m a. s. l.); – Ognjanovo [Огняново] (43° 53’ N, 27° 38’ E, 200 m a. s. l.); – Onogur, Ergele Peštera cave [Оногур, Ергеле пещера] (43° 49’ N, 27° 34’ E, 200 m a. s. l.); – Onogur, Suhata Šankaja cave [Оногур, Сухата шанкая] (43° 49’ N, 27° 34’ E, 200 m a. s. l.); – Pop Kralevo [Поп Кралево] (43° 58’ N, 27° 22’ E, 120 m a. s. l.); – Rujno, Ajazmoto cave [Руйно, Аязмото] (43° 49’ N, 27° 1’ E, 180 m a. s. l.); – Vojnovo, Malkata Badžalija cave [Войново, Малката Баджалия] (43° 58’ N, 27° 25’ E, ca. 160 m a. s. l.); – S l i v e n [С л и в е н]: Kipilovo, Kipilovskata Peštera cave [Кипилово, Кипиловската пещера] (42° 53’ N, 26° 13’ E,

500 m a. s. l.); – Kotel [Котел] (42° 56’ N, 26° 30’ E, 650 a. s. l.); – Kotel, Bučaštata Peštera cave [Котел, Бучащата пещера] (42° 56’ N, 26° 26’ E, 650 a. s. l.); – Kotel, Lednicata cave, Zlosten [Котел, Ледницата, Злостен] (42° 56’ N, 26° 35’ E, ca. 700 a. s. l.); – Kotel, Nirica cave [Котел, Нирица] (42° 56’ N, 26° 26’ E, ca. 700 a. s. l.); – Kotel, Orlovata Peštera, Zelenič [Котел, Орловата пещера, Зеленич] (42° 56’ N, 26° 20’ E, ca. 700 a. s. l.); – Kotel, Subatta, Zlosten [Котел, Субатта, Злостен] (42° 56’ N, 26° 35’ E, ca. 700 a. s. l.); – Sliven [Сливен] (42° 40’ N, 26° 19’ E, 240 m a. s. l.); – Sliven, Zmejovi Dupki cave [Сливен, Змейови дупки] (42° 40’ N, 26° 19’ E, ca. 400 m a. s. l.); – Tvărdica, Măglivijat Snjag cave [Твърдица, Мъгливият сняг] (42° 42’ N, 25° 53’ E, 1100 m a. s. l.); – Tvărdiški Prohod, Bukovec hut [Твърдишки проход, хижа Буковец] (42° 46’ N, 25° 55’ E, 1100 m a. s. l.). – S m o l j a n [С м о л я н]: Borikovo, Borikovskata Peštera cave [Бориково, Бориковската пещера] (41° 28’ N, 24° 37’ E, 1200 m a. s. l.); – Borino, Eminovata Peštera cave [Борино, Еминовата пещера] (41° 40’ N, 24° 16’ E, ca. 1200 m a. s. l.); – Borino, Kastrakli reserve [Борино, резерват Кастракли] (41° 42’ N, 24° 19’ E, ca. 1200 m a. s. l.); – Čepelare [Чепеларе] (41° 43’ N, 24° 40’ E, 1250 m a. s. l.); – Čepelare, Samurski Dupki cave [Чепеларе, Самурски дупки] (41° 42’ N, 24° 39’ E, 1250 m a. s. l.); – Gela [Гела] (41° 39’ N, 24° 35’ E, ca. 1350 m a. s. l.); – Gela, Lednicata cave [Гела, Ледницата] (41° 38’ N, 24° 34’ E, 1540 m a. s. l.); – Jagodina [Ягодина] (41° 37’ N, 24° 21’ E, ca. 1200 m a. s. l.); – Jagodina, Dolna Karanska Dupka cave [Ягодина, Долна Каранска дупка] (41° 37’ N, 24° 21’ E, ca. 1200 m a. s. l.); – Jagodina, Gorna Karanska Dupka cave [Ягодина, Горна Каранска дупка] (41° 37’ N, 24° 21’ E, ca. 1200 m a. s. l.); – Jagodina, Imamova Dupka cave (= Jagodinskata Peštera cave) [Ягодина, Имамова дупка (= Ягодинската пещера)] (41° 37’ N, 24° 21’ E, ca. 1050 m a. s. l.); – Jagodina, Sančova Dupka cave [Ягодина, Санчова дупка] (41° 37’ N, 24° 21’ E, ca. 1200 m a. s. l.); – Mogilica, Uhlovica cave [Могилица, Ухловица] (41° 30’ N, 24° 38’ E, 1040 m a. s. l.); – Nadarci, Nadarskata Peštera cave [Надарци, Надарската пещера] (41° 31’ N, 24° 37’ E, 1050 m a. s. l.); – Orehovo [Орехово] (41° 52’ N, 24° 37’ E, ca. 1060 m a. s. l.); – Orehovo, Modărskata Peštera cave [Орехово, Модърската пещера] (41° 52’ N, 24° 37’ E, ca. 1050 m a. s. l.); – Pamporovo [Пампорово] (41° 38’ N, 24° 40’ E, 1600 m a. s. l.); – Široka Lăka [Широка лъка] (41° 40’ N, 24° 34’ E, 1200 m a. s. l.); – Stojkite [Стойките] (41° 38’ N, 24° 37’ E, ca. 1600 m a. s. l.); – Tešel, Drangaleška Propast chasm [Тешел, Драгалешка пропаст] (41° 40’ N, 24° 25’ E, 1500 m a. s. l.); – Trigrad, Djavolskoto Gărlo cave [Триград, Дяволското гърло] (41° 36’ N, 24° 22’ E, 1500 m a. s. l.); – Trigrad, Raž 3 cave [Триград, Раж 3] (41° 36’ N, 24° 22’ E, 1500 m a. s. l.). – S o f i j a [С о ф и я]: Barlja, Dedovo Pole, Šamaka cave [Барля, Дедово поле, Шамака] (43° 6’ N, 22° 58’ E, ca. 1000 m a. s. l.); – Beledie Han, Kolibata cave [Беледие хан, Колибата] (42° 52’ N, 23° 10’ E, ca. 750 m a. s. l.); – Beledie Han, Komina cave [Беледие хан, Комина] (42° 52’ N, 23° 10’ E, ca. 750 m a. s. l.); – Beledie Han [Беледие хан] (42° 52’ N, 23° 10’ E, ca. 680 m a. s. l.); – Beli Iskar, Beli Iskar dam [Бели Искар, язовир Бели Искар] (42° 16’ N, 23° 31’ E, 1200 m a. s. l.); – Berende Izvor, Temnata Dupka cave [Беренде Извор, Темната дупка] (43° 0’ N, 22° 53’ E, ca. 560 m a. s. l.); – Bojana, park [Бояна, парк] (42° 38’ N, 23° 16’ E, 700 m a. s. l.); – Bojana, Zlatnite Mostove [Бояна, Златните мостове] (42° 36’ N, 23° 16’ E, 1400 m a. s. l.); – Bojenica, Razdolci [Бойеница, Раздолци] (43° 1’ N, 23° 49’ E, ca. 400 m a. s. l.); – Borovec [Боровец] (42° 7’ N, 23° 0’ E, 1350 m a. s. l.); – Borovec, Sitnjakovo [Боровец, Ситняково] (42° 7’ N, 23° 0’ E, 1500 m a. s. l.); – Bov, Izdrimec [Бов, Издримец] (43° 1’ N, 23° 25’ E, 1400 m a. s. l.); – Bov, Mečata Dupka cave [Бов, Мечата дупка] (43° 1’ N, 23° 22’ E, ca. 1000 m a. s. l.); – Buhovo, Murgaš hut [Бухово, хижа Мургаш] (42° 46’ N, 23° 34’ E, 1400 m a. s. l.); – Cerovo [Церово] (43° 0’ N, 23° 19’ E, 500 m a. s. l.); – Cerovo, Vodnata Peštera cave [Церово, Водната пещера] (43° 0’ N, 23° 19’ E, 500 m a. s. l.); – Dragalevci [Драгалевци] (42° 37’ N, 23° 19’ E, 700 m a. s. l.); – Drenovo, Goljamata Temnota cave [Дреново, Голямата Темнота] (42° 57’ N, 23° 12’ E, ca. 800 m a. s. l.); – Ginci, Dinevata Pešt cave [Гинци, Диневата пещ] (43° 4’ N, 23° 6’ E, 1150 m a. s. l.); – Ginci, Goljamata Balabanova Dupka cave [Гинци, Голямата Балабанова дупка] (43° 4’ N, 23° 6’ E, ca. 1500 m a. s. l.); – Ginci, Petrohan pass [Гинци, проход Петрохан] (43° 4’ N, 23° 6’ E, 1450 m a. s. l.); – Ginci, Sedlaroto cave (Bilin Dol) [Гинци, Седларото (Билин дол)] (43° 4’ N, 23° 6’ E, ca. 1500 m a. s. l.); – Ginci, Tošova Dupka cave (Zaskogo) [Гинци, Тошова дупка (Заского)] (43° 4’ N, 23° 6’ E, 1150 m a. s. l.); – Golema Rakovica, Peštta cave [Голема Раковица, Пещта] (42° 37’ N, 23° 48’ E, 700 m a. s. l.); – Ihtiman [Ихтиман] (42° 25’ N, 23° 49’ E, 650 m a. s. l.); – Iskrec [Искрец] (42° 58’ N, 23° 15’ E, 600 m a. s. l.); – Iskrec, Dušnika cave [Искрец, Душника] (42° 58’ N, 23° 15’ E, 600 m a. s. l.); – Iskrec, Peštta cave [Искрец, Пещта] (42° 58’ N, 23° 15’ E, 600 m a. s. l.); – Kazičene [Казичене] (42° 40’ N, 23° 28’ E, 570 m a. s. l.); – Kokaljane, Urvič [Кокаляне, Урвич] (42° 34’ N, 23° 25’ E, 700 m a. s. l.); – Kostinbrod [Костинброд] (42° 49’ N, 23° 13’ E, 550 m a. s. l.); – Lakatnik [Лакатник] (43° 6’ N, 23° 22’ E, ca. 600 m a. s. l.); – Lakatnik, Goljamata Vraža Dupka cave [Лакатник, Голямата Вража дупка] (43° 2’ N, 23° 23’ E, ca. 600 m a. s. l.); – Lakatnik, Gornata Peštera cave [Лакатник, Горната пещера] (43° 2’ N, 23° 23’ E, ca. 600 m a. s. l.); – Lakatnik, Răžiškata Peštera cave (= Suhata Peštera cave) [Лакатник, Ръжишката пещера (= Сухата пещера)] (43° 2’ N, 23° 23’ E, ca. 650 m a. s. l.); – Lakatnik, Svinskata Dupka cave [Лакатник, Свинската дупка] (43° 2’ N, 23° 23’ E, ca. 600 m a. s. l.); – Lakatnik, Temnata Dupka cave [Лакатник, Темната дупка] (43° 2’ N, 23° 23’ E, ca. 500 m a. s. l.); – Lipnica, Kozarnika

cave [Липница, Козарника] (43° 1’ N, 23° 45’ E, ca. 600 m a. s. l.); – Lipnica, Krivata Pešt cave [Липница, Кривата пещ] (43° 1’ N, 23° 45’ E, ca. 600 m a. s. l.); – Pasarel, Iskăr river [Пасарел, р. Искър] (42° 31’ N, 23° 30’ E, ca. 800 m a. s. l.); – Praveška Lăkavica, Al’ova Dupka cave [Правешка Лъкавица, Альова дупка] (42° 57’ N, 23° 58’ E, ca. 500 m a. s. l.); – Sofija [София] (42° 40’ N, 23° 19’ E, 590 m a. s. l.); – Sofija, Krasno Selo [София, Красно село] (42° 40’ N, 23° 19’ E, 590 m a. s. l.); – Svoge [Своге] (42° 58’ N, 23° 21’ E, ca. 680 m a. s. l.); – Zasele, waterfall Skaklja [Заселе, Скакля] (43° 1’ N, 23° 19’ E, ca. 900 m a. s. l.). – S t a r a Z a g o r a [С т а р а З а г о р а]: Tulovo [Тулово] (42° 34’ N, 25° 33’ E, 350 m a. s. l.); – Tăža, Dždendema reserve [Тъжа, резерват Джендема] (42° 38’ N, 25° 4’ E, 1200 m a. s. l.); – Tăža, Dždendema reserve, Bezimenna cave [Тъжа, резерват Джендема, Безименна] (42° 38’ N, 25° 4’ E, 1100 m a. s. l.). – Š u m e n [Ш у м е н]: Divdjadovo, Zandana cave (Divdjadovski) [Дивдядово, Зандана пещера (Дивдядовски)] (43° 13’ N, 26° 55’ E, 120 m a. s. l.); – Madara, Hiljadite Očički [Мадара, Хилядите очички] (43° 16’ N, 27° 6’ E, 200 m a. s. l.); – Stanjanci [Станянци] (42° 58’ N, 26° 36’ E, 400 m a. s. l.); – Šumen, Zandana cave [Шумен, Зандана пещера] (43° 16’ N, 26° 55’ E, 350 m a. s. l.); – Šumen, Zvezdna Peštera cave (Šumensko Plato) [Шумен, Звездна пещера (Шуменско плато)] (43° 16’ N, 26° 55’ E, 300 m a. s. l.); – Šumen, Šumensko Plato park [Шумен, парк Шуменско плато] (43° 16’ N, 26° 55’ E, ca. 450 m a. s. l.). – T ă r g o v i š t e [Т ъ р г о в и щ е]: Omurtag [Омуртаг] (43° 6’ N, 26° 25’ E, 530 m a. s. l.); – Prolaz, Derventskata Peštera cave [Пролаз, Дервентската пещера] (43° 10’ N, 26° 30’ E, 350 m a. s. l.); – Tărgovište, Marina Dupka cave [Търговище, Марина дупка] (43° 15’ N, 26° 34’ E, 200 m a. s. l.). – V a r n a [В а р н а]: Beloslav [Белослав] (43° 15’ N, 26° 34’ E, 200 m a. s. l.); – Beloslav, Temnata Dupka cave [Белослав, Темната дупка] (43° 15’ N, 26° 34’ E, 200 m a. s. l.); – Komunari [Комунари] (43° 1’ N, 27° 16’ E, 90 m a. s. l.); – Varna [Варна] (43° 13’ N, 27° 55’ E, 80 m a. s. l.); – Varna, Evksinograd [Варна, Евксиноград] (43° 13’ N, 27° 55’ E, 80 m a. s. l.); – Varna, Geberdženska Peštera cave [Варна, Гебердженска пещера] (43° 13’ N, 27° 55’ E, 80 m a. s. l.); – Varna, Pobitite Kamăni [Варна, Побитите камъни] (43° 13’ N, 27° 55’ E, 80 m a. s. l.). – V e l i k o T ă r n o v o [В е л и к о Т ъ р н о в о]: Beljakovec, Goljamata Podlisca cave [Беляковец, Голямата подлисца] (43° 6’ N, 25° 34’ E, 350 m a. s. l.); – Beljakovec, Preobraženski monastery [Беляковец, Преображенски манастир] (43° 6’ N, 25° 34’ E, 350 m a. s. l.); – Emen, Emenskata Peštera cave [Емен, Еменската пещера] (43° 7’ N, 25° 21’ E, 300 m a. s. l.); – Emen, Troana cave [Емен, Троана] (43° 7’ N, 25° 21’ E, 300 m a. s. l.); – Musina, Musinskata Peštera cave [Мусина, Мусинската пещера] (43° 8’ N, 25° 25’ E, 230 m a. s. l.); – Svištov [Свищов] (43° 37’ N, 25° 19’ E, 130 m a. s. l.). – V i d i n [В и д и н]: Car Petrovo, Vărkan cave [Цар Петрово, Въркан] (43° 57’ N, 22° 37’ E, 200 m a. s. l.); – Gorni Lom, Desni Suhi Peč cave [Горни Лом, Десни сухи печ] (43° 28’ N, 22° 43’ E, 500 m a. s. l.); – Gorni Lom, Levi Suhi Peč cave [Горни Лом, Леви сухи печ] (43° 28’ N, 22° 43’ E, 500 m a. s. l.); – Kračimir, Kračimirsko Vrelo cave [Крачимир, Крачимирско врело] (43° 32’ N, 22° 34’ , 600 m a. s. l.); – Orešec, Bašoviški Peč cave [Орешец, Башовишки печ] (43° 37’ N, 22° 43’ E, 380 m a. s. l.); – Orešec, Peč cave (Suhi Peč) [Орешец, Печ (Сухи печ)] (43° 37’ N, 22° 43’ E, ca. 450 m a. s. l.); – Rabiša, Magura cave [Рабиша, Магура] (43° 43’ N, 22° 36’ E, 230 m a. s. l.); – Vărtop, Prileparnika cave [Вартоп, Прилепарника] (43° 47’ N, 22° 48’ E, 200 m a. s. l.). – V r a c a [В р а ц а]: Beli Izvor, Černijat Izvor cave [Бели извор, Черният извор] (43° 16’ N, 23° 28’ E, 250 m a. s. l.); – Beli Izvor, Kalna Mătnica cave (Toškova Dupka) [Бели извор, Кална мътница (Тошкова дупка)] (43° 16’ N, 23° 28’ E, 250 m a. s. l.); – Botunja, Peštera No. 277 cave [Ботуня, пещера но. 277] (43° 16’ N, 23° 22’ E, 250 m a. s. l.); – Botunja, Bilernicite cave [Ботуня, Билерниците] (43° 16’ N, 23° 22’ E, 250 m a. s. l.); – Čiren, Ponora cave [Чирен, Понора] (43° 19’ N, 23° 34’ E, 350 m a. s. l.); – Čiren, Prilepnata Peštera cave (Božija Most) [Чирен, Прилепната пещера (Божия мост)] (43° 19’ N, 23° 34’ E, 350 m a. s. l.); – Drašan, Drašanskata Peštera cave [Драшан, Драшанската пещера] (43° 15’ N, 23° 55’ E, 370 m a. s. l.); – Gabare, Propastta chasm [Габаре, Пропастта] (43° 19’ N, 23° 55’ E, 240 m a. s. l.); – Kalen, Kalenskata Peštera cave [Кален, Каленската пещера] (43° 13’ N, 23° 46’ E, ca. 400 m a. s. l.); – Kunino [Кунино] (43° 12’ N, 24° 0’ E, 300 m a. s. l.); – Kunino, Čeloveča Dupka cave (Čeloveči Dol) [Кунино, Човечa дупка (Човечи дол)] (43° 12’ N, 24° 0’ E, 300 m a. s. l.); – Kunino, Gornata Peštera cave (Čeloveči Dol) [Кунино, Горната пещера (Човечи дол)] (43° 12’ N, 24° 0’ E, 300 m a. s. l.); – Kunino, Vasilica cave [Кунино, Василица] (43° 12’ N, 24° 0’ E, 320 m a. s. l.); – Liljače, Tigančeto cave [Лиляче, Тиганчето] (43° 19’ N, 23° 31’ E, 250 m a. s. l.); – Ljutibrod, Gara Čerepiš, Propastite cave [Лютибод, Гара Черепиш, Пропастите] (43° 6’ N, 23° 37’ E, 350 m a. s. l.); – Ljutibrod, Gara Čerepiš, Serapionovata Peštera cave [Лютибод, Гара Черепиш, Серапионовата пещера] (43° 6’ N, 23° 37’ E, 350 m a. s. l.); – Roman [Роман] (43° 8’ N, 23° 55’ E, 120 m a. s. l.); – Zgorigrad, Ledenika cave [Згориград, Леденика] (43° 10’ N, 23° 31’ E, 700 m a. s. l.); – Zgorigrad, Părševica hut, Părševiška Jama cave [Згориград, хижа Пършевица, Пършевишка яма] (43° 8’ N, 23° 26’ E, ca. 1350 m a. s. l.).