Bats (Mammalia: Chiroptera) of the Eastern Rhodopes (Bulgaria and Greece) – species diversity, zoogeography and faunal patterns

Teodora IVANOVA, Antoaneta GUEORGUIEVA

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Abstract. A study on the bat fauna of the Eastern Rhodopes (Bulgaria and Greece) was carried out in the period 1995-2002 by using mist netting and checking of known and potential roosts such as caves, galleries, buildings, etc. The existing literature data were reviewed and new data were added for 25 bat species from 86 localities: *Rhinolophus ferrumequinum*, *Rh. hipposideros*, *Rh. euryale*, *Rh. mehelyi*, *Rh. blasii*, *Myotis myotis*, *M. blythii*, *M. bechsteinii*, *M. emarginatus*, *M. capaccinii*, *M. daubentonii*, *M. aurascens*, *Nyctalus noctula*, *N. leisleri*, *N. lasiopterus*, *Pipistrellus pipistrellus*, *P. pygmaeus*, *P. nathusii*, *P. kuhlii*, *Hypsugo savii*, *Eptesicus serotinus*, *Plecotus austriacus*, *B. barbastellus*, *Miniopterus schreibersii*, *Tadarida teniotis*. Four species (*Myotis bechsteinii*, *Nyctalus lasiopterus*, *Barbastella barbastellus*, *Pipistrellus pipistrellus* s.str.) were recorded for the first time for the region. Zoogeographic characteristics and faunal patterns were discussed.

Key words: Chiroptera, Eastern Rhodopes, Bulgaria, Greece, distribution, zoogeography, faunal patterns.

Introduction

Bats still remain one of the less known group of mammals, including the fact that still there are new species described in Europe. The level of knowledge concerning different species is also unequal, the "Mediterranean" ones being less studied than the inhabitants of Central and Western Europe. The Balkan Peninsula remains one of the regions in Europe with the richest but relatively less studied bat fauna. Among the main aims of the present study are a review of available information, investigation of the species diversity and distribution of bats on the territory of the Eastern Rhodopes (Bulgaria and Greece) and an outline of the biogeographic patterns of the bat fauna under study.

History of research

The bat fauna of the Eastern Rhodopes has not been subject of a detailed study since the start of the present one. On the Bulgarian territory of the Eastern Rhodopes 8 species from 6 localities are cited: *Rhinolophus hipposideros* (BERON & GUEORGUIEV, 1967; BERON, 1994), *Rhinolophus ferrumequinum* (BERON, 1994), *Rhinolophus blasii* (GUEORGUIEV & BERON, 1962), *Pipistrellus pipistrellus* s.l. (HANÁK & JOSIFOV, 1959), *Pipistrellus pygmaeus* (DIETZ et al., 2002), *Miniopterus schreibersii* (NOWOSAD et al., 1987; BESHKOV, 1998) and "big" *Myotis* (*Myotis myotis/blythii*) (BESHKOV, 1998). VASILEVA & TODOROVA (1994) mentioned the presence of *Nyctalus noctula* and *Plecotus auritus*, but without exact localities. Dr. Ivan Horáček (Charles University, Prague) kindly allowed us to use unpublished data from a database where information for 5 more localities of 5 species is found (*Rh. euryale*, *Myotis mystacinus*, *M. daubentonii*, *P. austriacus* and *P. pipistrellus*). The list of the "13 most important bat caves in Bulgaria" (BESHKOV, 1998) includes the cave Yarasa Ini (= the Bat Cave), Kardjali district, with data about the species diversity, size and seasonal dynamics of the bat colony.

For the Greek part of the Eastern Rhodopes 20 bat species from 16 localities are known: *Rh. ferrumequinum* (HURKA, 1972; NIETHAMMER, 1974; KOCK, 1974; ILIOPOULOU-GEORGUDAKI, 1977, 1983; ILIOPOULOU-GEORGUDAKI & ONDRIAS, 1986; KRYŠTUFEK, 1993; ADAMACOPOULOS et al., 1995; IVANOVA, 2000; HANÁK et al., 2001), *Rh. hipposideros* (KANELLI & HATZISARANTOU, 1963; ADAMACOPOULOS et al., 1995; IVANOVA, 2000; HANÁK et al., 2001), *Rh. euryale* (KOCK, 1974; ILIOPOULOU-GEORGUDAKI, 1977, 1983; CRUCITTI, 1988; IVANOVA, 2000), *Rh. mehelyi* (HURKA, 1972; NIETHAMMER, 1974; VOHRALÍK & SOFIANIDOU, 1992; IVANOVA, 2000; HANÁK et al., 2001), *Rh. blasii* (ADAMACOPOULOS et al., 1995; HANÁK et al., 2001), *M. myotis* (ADAMACOPOULOS et al., 1995; IVANOVA, 2000; HANÁK et al., 2001), *M. blythii* (HURKA, 1972; NIETHAMMER, 1974; VOHRALÍK & SOFIANIDOU, 1992; SPITZENBERGER, 1996; IVANOVA, 2000; HANÁK et al., 2001;), *M. emarginatus* (ILIOPOULOU-GEORGUDAKI, 1977, 1983; CRUCITTI, 1988; IVANOVA, 2000), *M. capaccinii* (HURKA, 1972; NIETHAMMER, 1974; KOCK, 1974; IVANOVA, 2000; HANÁK et al., 2001), *M. mystacinus* s.l. (HURKA, 1972; CRUCITTI, 1988), *Nyctalus noctula* (ADAMACOPOULOS et al., 1995; IVANOVA, 2000; HANÁK et al., 2001), *Nyctalus leisleri* (IVANOVA, 2000), *Pipistrellus pipistrellus* s.l. (KANELLI & HATZISARANTOU, 1963; ADAMACOPOULOS et al., 1995; IVANOVA, 2000), *Pipistrellus nathusii* (ADAMACOPOULOS et al., 1995; IVANOVA, 2000), *Pipstrellus kuhlii* (ADAMACOPOULOS et al., 1995), *Hypsugo savii* (IVANOVA, 2000), *Eptesicus serotinus* (HANÁK et al., 2001), *Plecotus austriacus* s.l. (ILIOPOULOU-GEORGUDAKI, 1983; IVANOVA, 2000), *Plecotus austriacus* s.str. (SPITZENBERGER et al., 2001), *Miniopterus schreibersii* (HURKA, 1972; NIETHAMMER, 1974; KOCK, 1974; IVANOVA, 2000; HANÁK et al., 2001) and *Tadarida teniotis* (HANÁK et al., 2001).

The Cave of the Cyclops (Maronia) (ILIOPOULOU-GEORGUDAKI, 1983; PETROCHEILOU, 1984) and the Cave of Koufovouno (Koufovouno) (NIETHAMMER, 1974) are known as "bat" caves. A bat survey started in 1995 on the Bulgarian territory as part of the Program for Biodiversity Conservation of the Eastern Rhodopes. Additional studies in the adjacent regions of the Eastern Rhodopes in North Greece were necessary for a more exhaustive investigation and were performed in the period 1997-2000 (IVANOVA, 2000). The article of HANÁK et al. (2001) presents all new records and a complete list

of published records of bats from Greece, but in fact bats in Evros province have not been specially studied, beside the field studies of Dr. Manuel Ruedi (Geneva) in the summer of 2000. New data for the Bulgarian territory were collected during the summer field camp of the Dutch Mammal Society (BUYS & IVANOVA, 2003; VAN DER WAL et al., 2003).

Material and methods

Study area

The study area covers the territory of the Eastern Rhodopes situated on the border between Bulgaria and Greece and limited to the North by the valley of Arda River (including the northern ridges Kayadjik and Gorata), to the West – by the valley of Varbitsa River and the ridge Zhalti Dyal in Bulgaria, and the valley of Kuru River in Greece, to the South it reaches the valley of Tarnava River and the Aegean Sea and to the East - the valley of Maritsa (Evros) River (Fig. 1). The area is dominated by law mountain and hilly ranges (the average altitude is 300 m).

Material

The field studies were carried out in the period 1995-2002 in Bulgaria and Greece (217 days). The total number of observed bats is about 160 000 ind. from 24 species (1 species is known only from literature data) recorded in 72 localities. Localities are presented in Table 1 and Fig. 1. List of the material – locality (number, country, name of village, name of locality), date, number of individuals, sex, age, method and observer (if different from the authors) or a reference is presented in Appendix I.

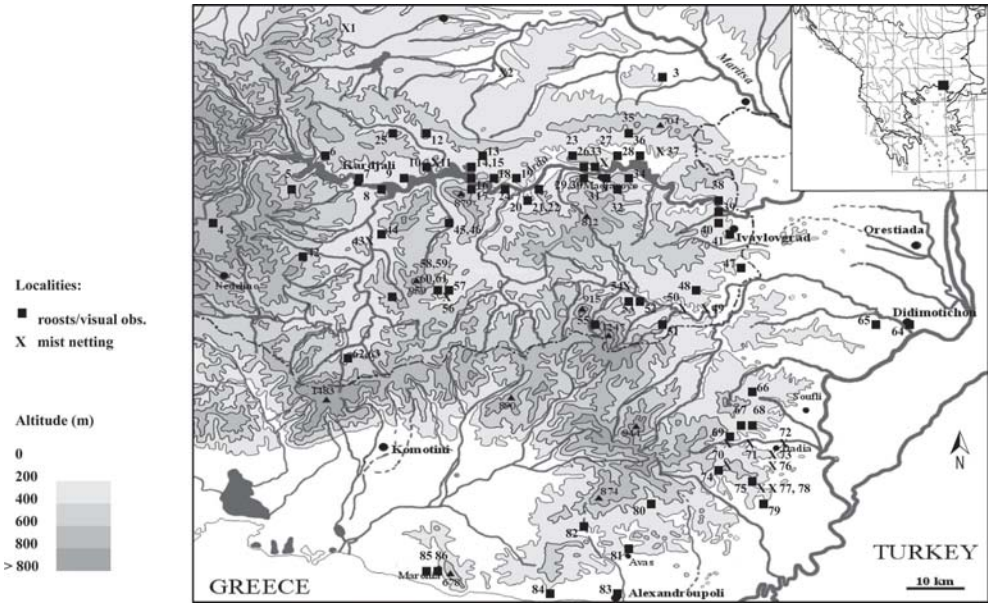

Fig. 1. Map of the studied area and localities where bats were recorded (the number of localities corresponds to those in Table 1)

Table 1
List of localities where bats were recorded (see Fig.1)

No	Country and village	Name of locality	Geographical coordinates	Type of locality	Alt. (m)	Number of species		Method
1	2	3	4	5	6	7		8
1	**BG** Spahievo	artificial gallery in a hill	41° 53' N, 25° 19' E	art. gallery	400	3	-	MN
2	**BG** Knizhovnik	over a bridge	41° 49' N, 25° 36' E	over river	180	1	-	MN
3	**BG** Lozen	art. gallery between Lozen and Cherna Mogila	41° 47' N, 26° 1' E	art. gallery	200	3	-	V
4	**BG** Byal Izvor	Djin Gugu Cave	41° 32' N, 25° 4' E	cave	600	1	-	V
5	**BG** Kobilyane	Vodnata Peshtera Cave	41° 36' N, 25° 16' E	cave	580	2	-	V
6	**BG** Dazhdovnitsa	Hasarskata Peshtera Cave	41° 40' N, 25° 18' E	cave	400	2	-	V
7	**BG** Kardjali	Kardjali	41° 38' N, 25° 22' E	building	300	1	?	V
8	**BG** Ostrovitsa	Tilki Ini Cave	41° 37' N, 25° 25' E	cave	220	1	-	V
9	**BG** Shiroko Pole	Karangil Cave	41° 37' N, 25° 28' E	cave	250	2	-	V
10	**BG** Visoka Polyana	Yarasa Ini Cave	41° 40' N, 25° 31' E	volcanic cave	400	5	N	V
11	**BG** Visoka Polyana	Gyumbyurdek Ini Cave	41° 40' N, 25° 31' E	volcanic cave	450	2	-	V, MN
12	**BG** Madrets	Maarata Cave	41° 42' N, 25° 31' E	cave	400	2	-	V
13	**BG** Byala Polyana	Manaf Koyusyu Cave	41° 40' N, 25° 37' E	cave	400	5	H	V
14	**BG** Byal Kladenets	Karadjainler Cave	41° 38' N, 25° 37' E	cave	280	2	-	V
15	**BG** Byal Kladenets	Malkata Peshtera Cave	41° 38' N, 25° 37' E	cave	280	1	-	V
16	**BG** Byal Kladenets	Goljamata Peshtera Cave	41° 38' N, 25° 37' E	volcanic cave	375	3	-	V
17	**BG** Studen Kladenets	Studen Kladenets Dam, the dam wall	41° 36' N, 25° 38' E	building	200	1	-	V
18	**BG** Svetoslav	rocky niche in river bank, S of the village	41° 38' N, 25° 38' E	cave	260	2	-	V
19	**BG** Dolno Cherkovishte	Zandana Cave	41° 37' N, 25° 45' E	cave	300	4	-	V
20	**BG** Oreshari	Gouk In Cave	41° 36' N, 25° 45' E	cave	380	3	-	V
21	**BG** Oreshari	Bliznatsite Cave	41° 36' N, 25° 45' E	cave	380	1	-	MN
22	**BG** Oreshari	Karangin Cave	41° 36' N, 25° 45' E	cave	380	9	N	V, MN
23	**BG** Dolni Glavanak	building	41° 40' N, 25° 49' E	building	450	1	-	V, M
24	**BG** Strandjevo	building	41° 37' N, 25° 46' E	building	220	1	-	V
25	**BG** Stremtsi	gallery	41° 43' N, 25° 25' E	art. gallery	350	1	-	V
26	**BG** Madjarovo	galleries №1 & №2, near the road to Haskovo	41° 37' N, 25° 52' E	art. gallery	200	1	-	V
27	**BG** Madjarovo	gallery №3, right under the road to Borislavtsi	41° 37' N, 25° 52' E	art. gallery	160	8	-	V, MN
28	**BG** Madjarovo	between rocks in Peshter-Dere Valley	41° 37' N, 25° 52' E	between rocks	180	1	-	V
29	**BG** Madjarovo	gallery №4, left to the road toBryagovets	41° 37' N, 25° 52' E	art. gallery	180	1	-	MN
30	**BG** Madjarovo	buildings in the village	41° 37' N, 25° 52' E	building	200	1	N	V
31	**BG** Madjarovo	Nature Inf. Conservation Center (NICCER)	41° 37' N, 25° 52' E	building	180	1	N	V
32	**BG** Madjarovo	gallery №5, road to Senoklas	41° 37' N, 25° 52' E	art. gallery	380	2	-	V
33	**BG** Madjarovo	rocky cliff Kovan Kaya	41° 37' N, 25° 52' E	rocky crevice	200	1	-	V

1	2	3	4	5	6	7	8
34	**BG** Gaberovo	Caves in Gyurgen-Dere Valley (1, 2 ,3, 4)	41° 37' N, 25° 55' E	volcaniccave	500	5 N	V, MN
35	**BG** Efrem	building	41° 43' N, 25° 55' E	building	320	1 -	V
36	**BG** Malki Voden	building	41° 40' N, 25° 56' E	building	120	1 N	V, M
37	**BG** Dabovets	over Dalbokata River	41° 40' N, 26° 0' E	over river	160	2 -	MN
38	**BG** Ivaylovgrad Dam	Electric Power Station Ivaylovgrad	41° 34' N, 26° 6' E	building	100	3 N	V
39	**BG** Ivaylovgrad Dam	abandoned buildings	41° 34' N, 26° 6' E	building	80	2 N	V, MN
40	**BG** Ivaylovgrad	Dupkata Cave	41° 31' N, 26° 7' E	cave	350	3 -	**V**
41	**BG** Ivaylovgrad	the municipality building	41° 31' N, 26° 7' E	building	180	1 N	V
42	**BG** Tarnovtsi	Karaguk Cave	41° 30' N, 25° 15' E	cave	400	3 -	V
43	**BG** Momchilgrad	over water	41° 31' N, 25° 25' E	over river	320	2 -	MN
44	**BG** Momchilgrad	Momchilgrad	41° 31' N, 25° 25' E	building	320	2 -	V
45	**BG** Tatul	a karstic acve	41° 32' N, 25° 33' E	cave	340	1 -	V
46	**BG** Tatul	small volcanic caves near the village	41° 32' N, 25° 33' E	volcaniccave	380	1 -	V
47	**BG** Belopolyane	Balopolyanskata Peshtera Cave	41° 27' N, 26° 8' E	cave	200	2 -	V, MN
48	**BG** Kostilkovo	abandoned village	41° 25' N, 26° 3' E	building	340	1 -	V
49	**BG** Dolno Lukovo	bridge over Byala Reka River	41° 22' N, 26° 4' E	over river	100	2 -	MN
50	**BG** Meden Buk	over Byala reka River	41° 22' N, 26° 1' E	over river	100	3 -	MN
51	**BG** Zhalti Chal	abandoned house	41° 21' N, 26° 0' E	building	400	1 -	V
52	**BG** Beli Dol	Caves (1 and 2)	41° 25' N, 25° 56' E	cave	200	1 -	V
53	**BG** Beli Dol	Mechkina Dupka Cave	41° 25' N, 25° 56' E	cave	200	2 -	V
54	**BG** Gugutka	over Chukurska River	41° 25' N, 25° 55' E	over river	200	1 -	MN
55	**BG** Strazhets	abandoned house	41° 22' N, 25° 52' E	building	440	1 -	V
56	**BG** Malka Chinka	under a bridge on the road to Golyama Chinka	41° 22' N, 25° 31'	over river	380	1 -	MN
57	**BG** Ribino	Kondjalar Cave	41° 22' N, 25° 31'	cave	460	3 N	V, MN
58	**BG** Ribino	Ayna Ini Cave	41° 22' N, 25° 31'	cave	400	9 N, H	V, MN, TT
59	**BG** Ribino	Brashlyanovata Cave	41° 22' N, 25° 31'	cave	415	2 -	V
60	**BG** Ribino	Prilepnata Cave	41° 22' N, 25° 31'	cave	410	1 -	V
61	**BG** Ribino	Samara Cave	41° 22' N, 25° 31'	cave	410	10 H	V, MN
62	**BG** Kremen	cave	41° 19' N, 25° 21' E	cave	500	1 -	V
63	**BG** Kremen	Golyamata Peshtera Cave	41° 19' N, 25° 21' E	cave	500	1 -	V
64	**GR** Didimotichon	cave	41° 21' N, 26° 29' E	cave	90	7 -	V, MN
65	**GR** Koufovouno	Cave of Koufovouno	41° 22' N, 26° 26' E	cave	90	6 N	V, TT
66	**GR** Giannouli	military bunker	41° 13' N, 26° 11' E	building	200	1 N	V
67	**GR** Dadia	galleries Tsoutourou (1,2,3)	41° 8' N, 26° 13' E	art. gallery	230	6 N	V
68	**GR** Dadia	galleries Saint Barbara	41° 8' N, 26° 13' E	art. gallery	240	4 H	V, MN
69	**GR** Kotronia	art. gallery	41° 10' N, 26° 7' E	art. gallery	300	1 -	V
70	**GR** Kotronia	over Diavolorema River	41° 9' N, 26° 7' E	over river	160	4 -	MN
71	**GR** Dadia	Diavolorema River, NW of Dadaia	41° 7' N, 26° 13' E	over river	100	5 -	MN
72	**GR** Dadia	Diavolorema River, near bridge of Dadia	41° 7' N, 26° 13' E	over river	20	4 -	MN
73	**GR** Dadia	rocky hill SW of Dadaia	41° 7' N, 26° 13' E	on rocky hill	100	1 -	MN
74	**GR** Dadia	Kamilata Cave	41° 7' N, 26° 13' E	volcanic cave	450	8 (N)	V, MN
75	**GR** Lefkimi	Bouba Lefkimis Cave	41° 1' N, 26° 11' E	volcanic cave	260	4 N	V
76	**GR** Lira	small pond W of Lira	41° 4' N, 26° 16' E	over river	20	1 -	MN
77	**GR** Provatonas	big rocky niche	41° 1' N, 26° 15' E	volcanic cave	90	6 -	V, MN
78	**GR** Provatonas	over Provatonas river	41° 1' N, 26° 15' E	over river	80	2 -	MN
79	**GR** Lefkimi	Cave	41° 1' N, 26° 11' E	volcanic cave	100	2 -	?
80	**GR** Esimi	Esimi	41° 4' N, 25° 53' E	building	700	1 -	?
81	**GR** Avas	Avantos Cave	40° 55' N, 25° 55' E	cave	150	3 (N)	?

1	2	3	4	5	6	7	8
82	**GR** Kirki	river 6 km E	40° 58' N, 25° 50' E	over river	300	2 -	MN
83	**GR** Alexandroupoli	?	40° 51' N, 25° 52' E	?	0	2 -	?
84	**GR** Makri	?	40° 51' N, 25° 14' E	?	50	1 -	?
85	**GR** Maronia	creek 2 km SW	39° 54' N, 25° 32' E	over river	170	1 -	?
86	**GR** Maronia	Cave of the Cyclops	39° 54' N, 25° 33' E	cave	190	8 N,H	V, TT

N = nursery colony of one or several species, **H** = hibernacula (>20 ind.)

In the text and tables the following abbreviations are used: BG = Bulgaria; GR = Greece; V = visual observation; MN = mist netting; TT = Tuttle trap; M = manual catching; BD = ultrasound bat detector; ind. = individuals; ad = adult; juv = juvenile; BP = Boyan Petrov; PB = Petar Beron; IH = Ivan Horáček; VZZ = information collected during the summer camp of the Dutch Mammal Society.

Methods

The species diversity was determined by using the following methods: visual observations; mist netting from April to October at cave entrances, over small streams, around buildings, etc.; catching with harp (Tuttle) trap; checking of potential roosts - caves, artificial galleries, buildings, tree holes, etc. For every caught individual the following features were determined - species, sex, age and reproductive status; morphometric measurements were taken. The localities (roosts) were identified by using available literature data, questionnaires among local people and checking of potential roosts. A detailed survey has been done on the underground roosts. From the 140 known caves in the Bulgarian part (data from the catalogue of the Bulgarian Speleological Federation), 80 were checked (including all caves longer than 20 m) and assessed as recent or potential bat roosts. All caves in Greece known from the literature were checked also. Petterson D100 and D200 ultrasound bat detectors were used to search for roosts, count the size of colonies and for species determination. Subfossil material was collected and determined from underground roosts.

The field work was done under license of the Ministry of environment and waters (BG) and the Ministry of environment, agriculture and regional planning (GR).

Results and discussion

Species diversity

On the study territory of the Eastern Rhodopes 25 bat species are recorded (Table 2). They represent 70% (3 families and 10 genus) of the total number of 35[1] species (3 families and 10 genus) inhabiting the continental part of Europe and indicate a high diversity of bat fauna on European level. The species *Myotis bechsteinii*, *Nyctalus lasiopterus*, *Barbastel-*

[1] The number of European bat species is presented according SCHOBER & GRIMMBERGER (1998) plus the lately described species: *Pipistrellus pygmaeus*, *Myotis alcathoe*, *M. aurascens*, *Plecotus kolombatovici*, *P. macrobullaris.*

Table 2
List of bat species recorded in the Eastern Rhodopes and their occurrence

Species	BG	GR	Number of localities	% of the total number of localities (n = 86)
RHINOLOPHIDAE				
Rhinolophus ferrumequinum	+	+	47	55
Rhinolophus hipposideros	+	+	37	43
Rhinolophus euryale	+	+	15	17
Rhinolophus mehelyi	+	+	5	6
Rhinolophus blasii	+	+	11	13
VESPERTILIONIDAE				
Myotis myotis	+	+	16	19
Myotis blythii	-	+	6	7
Myotis bechsteinii	+	+	2	2
Myotis emarginatus	+	+	7	8
Myotis capaccinii	+	+	15	17
Myotis daubentonii	+	-	2	2
Myotis mystacinus s.l.	+	+	6	7
Myotis aurascens	+	-	1	1
Nyctalus noctula	+	+	6	7
Nyctalus leisleri	-	+	1	1
Nyctalus lasiopterus	+	-	1	1
Pipistrellus pipistrellus s.l.	+	+	15	17
Pipistrellus pipistrellus s. str.	+	(+)	4	5
Pipistrellus pygmaeus	+	-	1	1
Pipistrellus nathusii	-	+	2	2
Pipistrellus kuhlii	-	+	1	1
Hypsugo savii	+	+	8	9
Eptesicus serotinus	+	+	6	7
Plecotus austriacus s.l.	+	+	13	15
Plecotus austriacus s. str.	(+)	+	1	1
Barbastella barbastellus	+	-	1	1
Miniopterus schreibersii	+	+	13	15
MOLOSSIDAE				
Tadarida teniotis	+	+	3	3

la barbastellus and *P. pipistrellus* s.str. are recorded for the first time for the studied area. *P. kuhlii* is known only from literature data.

For the territory of Bulgaria 21 species (3 families and 10 genus) or 66 % of the bat fauna of the country are recorded. Eleven (11) species are recorded for the first time for the area: *Rh. mehelyi*, *M. bechsteinii*, *M. emarginatus*, *M. capaccinii*, *M. daubentonii*, *H. savii*, *E. serotinus*, *Nyctalus lasiopterus*, *B. barbastellus*, *Tadarida teniotis*, *Pipistrellus pipistrellus* s.str. For the territory of Greece 21 species are recorded (3 families and 9 genus) or 66% of the country bat fauna (32 bat species, after HANÁK et al. 2001). One species - *M. bechsteinii* is recorded for the first time for the area.

The distribution of recorded species among the known 86 localities and their occurrence is presented in Table 2. With highest number of known localities and respectively highest percentage of occurrence are the species *Rh. ferrumequinum* and *Rh. hipposideros* (55% and 43%), followed by *M. myotis* (19%), *Rh. euryale*, *M. capaccinii* and *P. pipistrellus*

s.l. (17%), *P. austriacus* and *M. schreibersii* (15%), *Rh. blasii* (13%), *H. savii* (9%), *M. emarginatus* (8%). The occurrence of the rest of the species is 1% to 6%.

Zoogeographic characteristic

The views concerning the origin and zoogeography of the recent mammal fauna of Bulgaria, including the bat fauna, are summarized by POPOV & DELCHEV (1997) and POPOV (1997). Large-scale biogeographic patterns and major trends of Palearctic bat fauna are revealed by HORÁČEK et al. (2000) based on detailed taxonomic and biogeographic analysis. The zoogeographic patterns of the European bat fauna according POPOV (1997) and HORÁČEK et al. (2000) are similar in principle, with main differences in the concept for the range of the zoogeographical categories. The zoogeographic characteristics of the bat fauna of the Eastern Rhodopes are based on the concept of HORÁČEK et al. (2000) (Table 3) and presented in Table 4.

Table 3
Zoogeographic patterns in European bat species (after HORÁČEK et al., 2000)

Faunal complex	Species	
1. Boreal (Species, related to the coniferous (taiga) and mixed forests)	*P. auritus* *E. nilssonii* *V. murinus*	*M. brandtii* *M. daubentonii* *M. dasycneme*
2. Nemoral (Species, reaching maximal abundance in the temperate deciduous forests)	*N. noctula* *N. leisleri* *N. lasiopterus* *P. nathusii* *(P. pygmaeus ?)*	*M. nattereri* *M. bechsteinii* *M. mystacinus* *B. barbastellus*
3. Mediterranean (Species, related with thermoxerophile forests and steppes)		
3.1 Species that essentially extends their ranges beyond limits of the Mediterranean	*Rh. ferrumequinum* *Rh. hipposideros* *P. pipistrellus* *E. serotinus* *P. austriacus*	*M. myotis* *M. blythii* *M. emarginatus* *(M. aurascens ?)*
3.2 Species with ranges centred within the Mediterranean	*Rh. euryale* *Rh. mehelyi* *Rh. blasii* *M. capaccinii*	*P. kuhlii* *H. savii* *M. schreibersii* *T. teniotis*

Table 4
Zoogeographic characteristic of the bat fauna of the Eastern Rhodopes (occurrence is presented as % from the total number of localities, n = 86)

Faunal complex	Bulgaria		Eastern Rhodopes		
	Number of species	%	Number of species	%	Occurrence (%)
Boreal	6	19	1	4	2
Nemoral	9	28	7	28	16
Mediterranean	17	53	17	68	96
Total	32	100	25	100	-

The biogeographic analysis of HORÁČEK et al. (2000) reveals that the bat fauna of Bulgaria (as well as of the whole Balkan Peninsula) is dominated by the Mediterranean faunal complex. On the territory of the Eastern Rhodopes this tendency is particularly outlined as 68% of the bat species with occurrence in 96% of the known localities are Mediterranean faunal elements. Those species are represented with high number of individuals in the area and for all of them (except *P. kuhlii*) nursery colonies are known.

The nemoral faunal complex is weakly represented with species recorded in 16% of the localities and presented with single, mostly male individuals. For all of the nemoral species there are no data for reproduction activity in the area.

The boreal faunal complex is represented very weakly with only one species in 2% of the localities. For some of the other boreal species, as *E. nilssonii*, *M. brandtii* and *M. dasycneme,* Bulgaria is on the southern border of their range and their possible occurrence in the studied area is highly unlikely (HANÁK & HORÁČEK, 1986; BENDA, 1999; LIMPENS, 2001).

Faunal patterns

Recent genetic and morphological studies have confirmed the existence of new sibling bat species in Europe, all of them having their range of distribution also on the Balkan Peninsula. This raised a lot of questions related to species identification in faunal studies and it requires special attention to be given to the interpretation of faunal data from the area. The taxonomic groups of special concern are:

a) *Pipistrellus pipistrellus* and *P. pygmaeus*. As shown by HANÁK et al. (2001), DIETZ et al. (2002) and the data from our study, both species occur in sympatry in the Eastern Rhodopes. Preliminary data suggest higher occurrence of *Pipistrellus pipistrellus*. There are already some data on the ecology of both species that could explain such a pattern – *P. pipistrellus* seems more synanthropic, and *P. pygmaeus* seems more related to primary forest habitats.

b) the genus *Plecotus*. The occurrence of four species in south-eastern Europe was revealed - in addition to *P. auritus* and *P. austriacus*, there are *P. kolombatovici* Đulić, 1980 and *P. macrobullaris* Kuzjakin, 1965 (= *P. alpinus* Kiefer et Veith, 2002, = *P. microdontus* Spitzenberger, 2002) (ĐULIĆ, 1980; HANÁK et al., 2001; KIEFER et al., 2002; SPITZENBERGER et al., 2002; KIEFER & HELVERSEN, 2004 a, b). Concerning the Balkan Peninsula, all these four species have been confirmed to occur in Greece, both mainland and some islands (HANÁK et al., 2001; KIEFER & HELVERSEN, 2004 a, b). A revision of the systematic and distributional status of the genus *Plecotus* in Bulgaria (BENDA & IVANOVA, 2003) reveals that only two species can be considered as verified to occur in the territory of Bulgaria – *P. auritus* and *P. austriacus*. *P. austriacus* is the more common species, widely distributed at low altitudes, and *P. auritus* is restricted to mountain ranges in Bulgaria (> 1000 m a.s.l.). Concerning these data, we could expect *P. austriacus* to be the most abundant *Plecotus* species in the Eastern Rhodopes as well, but this should be the aim of further detailed field studies to evaluate the occurrence of *Plecotus* species in Bulgaria.

c) *Myotis mystacinus*-group. The present taxonomic revisions of the group reveal the occurrence of four species on the Balkans – *M. brandtii*, *M. mystacinus*, *M. aurascens* and *M. alcathoe*. The southernmost records of *M. brandtii* are from mountain areas in Bulgaria

and the species is not recorded for Greece (BENDA, 1999), e.g. occurrence in the Eastern Rhodopes is less probable. The occurrence of *M. aurascens* is confirmed both for Bulgaria (including the Eastern Rhodopes) and Greece, suggesting that it is the most abundant form in the Balkans (BENDA & TSYTSULINA, 2000; HANÁK et al., 2001). *M. alcathoe* is known from several mountain localities in Central Greece, but recently it was also confirmed in Central Europe (HANÁK et al., 2001; RUEDI et al., 2002; BENDA et al., 2003). Most critical and debatable is the occurrence of *M. mystacinus* s. str. on the Balkans. According to the present knowledge *M. mystacinus* and *M. alcathoe* can hardly be separated on the basis of morphological characters but merely through genetic methods. This makes it impossible to evaluate the present distribution of *M. mystacinus* s. str. in the area under study, as well as over the whole Balkan range (see HELVERSEN et al., 2001; HANÁK et al., 2001; BENDA et al., 2003).

The fact that the occurrence of *P. kuhlii* was not confirmed is possibly due to its synanthropy patterns of distribution and the relatively limited surveys in the towns and villages in the area. The relatively low occurrence of the nemoral bat species (1-6%) could be explained on the one hand by the limited suitable biotopes in the studied area, namely humid deciduous forests within the range of about and above 1000 m a.s.l., and on the other hand by the fact that exactly those habitats are situated along the borderline and their investigation was impeded.

The described localities of bats in Eastern Rhodopes have an average altitude of 278 m a.s.l. (20 m minimum and 600 m maximum), e.g. they belong to the same altitudinal range (see PANDURSKA, 1996).

A comparison of the studied bat fauna with that of the European part of Turkey (Thrace), described by BENDA & HORÁČEK (1998), revealed mostly a full correspondence regarding species diversity and occurrence. The only exception is the occurrence of *M. nattereri* and *P. auritus* in Turkey, but their localities are situated in Strandja Mts. (= Istranca Mts.), which differs significantly in its physical geographic characteristics (especially climate and vegetation) from the Eastern Rhodopes.

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References

ADAMACOPOULOS T., GATZOYANNIS S., POIRAZIDIS K. (eds.). 1995. Study on the assessment, the enhancement of the legal infrastructure and the management of the protected area in the forest of Dadia. SES Summary. Athens, June 1995. 48 pp. (unpubl. report).

BENDA P. 1999. Three notes on the taxonomy of *Myotis brandtii* (Chiroptera: Vespertilionidae) and on the history of its recognition in the western part of Europe. - Lynx, n.s., **30**: 5-26.

BENDA P., HORÁČEK I. 1998. Bats (Mammalia, Chiroptera) of the Eastern Mediterranean. Part 1. Review of distribution and taxonomy of bats in Turkey. - Acta Soc. Zool. Bohem., **62**: 255-313.

BENDA P., IVANOVA T. 2003. Long-eared bats, *Plecotus* (Mammalia: Chiroptera), in Bulgaria: a revision of systematic and distributional status. – J. Nat. Mus., Nat. Hist. Ser., 172 (1-4): 157-172.

BENDA P., RUEDI M., UHRIN M. 2003. First record of *Myotis alcathoe* (Chirotpera: Vespertilionidae) in Slovakia. - Folia Zool., 52 (4): 359-365.

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

BERON P. 1994. Résultats des recherches biospéléologiques en Bulgarie de 1971 à 1994 et liste des animaux cavernicoles bulgares. - Tranteeva, Sofia, **1**: 137 pp.

BERON P., GUEORGUIEV V. 1967. Essai sur la faune cavernicole de Bulgarie. II. Résultats des recherches biospéléologiques de 1961 à 1965. - Bull. Inst. Zool., Sofia, **24**: 151-212.

BESHKOV V. 1998. The Bats in Bulgaria. - In: Meine C. (ed.). Bulgaria's Biological Diversity: Conservation Status and needs Assessment. Biodiversity Support Program, Washington, D.C., **1-2**: 453-466.

BUYS J., IVANOVA T. 2002. Workshop on Mammals in the Eastern Rhodopes. – Hist. nat. bulg., **15**: 142 (In Bulgarian).

CRUCUTTI P. 1988. Chirotteri della Tracia e dell'isola di Samotracia. - Atti. Soc. ital. Sci. nat. Museo civ. Stor. nat. Milano, 129 (1): 78-84.

DIETZ CH., SCHUNGER I., DIETMAR N., SIEMERS B.M., IVANOVA T. 2002. First record of *Pipistrellus pygmaeus* (Leach, 1825) (Vespertilionidae, Chiroptera) for Bulgaria. – Hist. nat. bulg., **14**: 117-121.

ĐULIĆ B. 1980. Morphological characterisctics and distribution of *Plecotus auritus* and *Plecotus austriacus* in some regions of Yugoslavia. - In: Wilson D. E., Gardner A. L. (eds.). Fifth International Bat Research Conference. Texas Tech Press, Lubbock, 151-161.

GUEORGUIEV V., BERON P. 1962. Essai sur la faune cavernicole de Bulgarie.I. - Ann. Spéléol., **8** (2-3): 285-441.

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

HANÁK V., HORÁČEK I. 1986. Zur Südgrenze des Areales von *Eptesicus nilssoni* (Chiroptera, Vespertilionidae). - Ann. Naturhist. Mus. Wien, **88-89** (B): 377-388.

HANÁK V., JOSIFOV M. 1959. Zur Verbreitung der Fledermäuse Bulgariens. - Säugetierk. Mitt., **7** (4): 145-151.

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

HORÁČEK I., HANÁK V., GAISLER J. 2000. Bats of the Palearctic Region: a Taxonomic and Biogeographic Review. - In: Woloszyn B. W. (ed.). Approaches to Biogeography and Ecology of Bats. Proceedings of the VIIIth EBRS, Publ. Platan, Krakow, **1**: 11-157.

HŮRKA K. 1972. *Basilia mongolensis nudior* subsp. n. nebst Bemerkungen zur Nycteribien- und Streblidenfauna Thrakiens (Diptera: Pupipara). – Ann. Naturhist. Mus. Wien, **76**: 709-713.

ILIOPOULOU-GEORGUDAKI J. 1977. [Systematic study and geographic distribution of Chiroptera of Greece]. PhD Thesis. Faculty of Physics and Mathematics, University of Patras. 173 pp. (In Greek, unpublished).

ILIOPOULOU-GEORGUDAKI J. 1983. A record of the Chiropterofauna of the Greek caves. – In: Int. Meeting on the show caves and their problems, Athenes, 224-227.

ILIOPOULOU-GEORGUDAKI J., ONDRIAS J. C. 1986. Contribution to the study of *Rhinolophus ferrumequinum* (Schreber, 1774) in Greece with description of *R. ferrumequinum creticum* ssp. nov. - Biol. Gallo-Hellenica, **10**: 357-368.

IVANOVA T. 2000. New Data on Bats (Mammalia: Chiroptera) of the Eastern Rhodopes, Greece (Thrace, Evros). – Hist. nat. bulg., **11**: 117-125.

KANNELI A., HATZISARANTOU H. 1963. Mammals of Greece. - To Vouno, Athens, **230**: 6-21. (In Greek).

KIEFER A., HELVERSEN O. V. 2004a. *Plecotus macrobullaris* (Kuzjakin, 1965) – Alpenlangohr. – In: Krapp F. (ed.). Handbuch der Säugetiere Europas. Band 4: Fledertiere II. Vespertilionidae 2, Molossidae, Nycteridae. Aula-Verlag, Wiebelsheim, 1051-1058.

KIEFER A., HELVERSEN O. V. 2004b. *Plecotus kolombatovici* Đulić, 1980 – Balkanlangohr. – In: Krapp, F. (ed.): Handbuch der Säugetiere Europas. Band 4: Fledertiere II. Vespertilionidae 2, Molossidae, Nycteridae. Aula-Verlag, Wiebelsheim, 1059-1066.

KIEFER A., MAYER F., KOSUCH J., HELVERSEN O. V., VEITH M. 2002. Conflicting molecular phylogenies of European long-eared bats (*Plecotus*) can be explained by cryptic diversity. – Mol. Phylogen. Evol., **25**: 557–566.

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

KRYŠTUFEK B. 1993.Geographic variation in the Greater horseshoe bat *Rhinolophus ferrumequinum* in southeastern Europe. – Acta Theriol., **38**: 67-79.

LIMPENS H. 2001. Assesing the European distribution of the pond bat (*Myotis dasycneme*) using bat detectors and other survey methods. - Nietoperze, **2** (2): 169-178.

NIETHAMMER J. 1974. Zur Verbreitung und Taxonomie griechischer Säugetiere. - Bonn. zool. Beitr., **25** (1-3): 28-55.

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

PANDURSKA R. 1996. Altitudinal distribution of bats in Bulgaria. - Myotis, **34**: 45-50.

PETROCHEILOU A. 1984. The Greek caves. Ekdotike Athenon S.A., Athens. 160 pp.

POPOV V. 1997. Fauna contents: Mammals. - In: Jordanova M., Donchev D. (eds). Geography of Bulgaria. Academic Publishing House Prof. Marin Drinov, Sofia, 328-330 (In Bulgarian).

POPOV V., DELTSHEV Ch. 1997. Formation of contemporary fauna. - In: Jordanova M., Donchev D. (eds). Geography of Bulgaria. Academic Publishing House Prof. Marin Drinov, Sofia, 310-316 (In Bulgarian).

RUEDI M., JOURDE P., GIOSA P., BARATAUD M., ROUÉ S. Y. 2002. DNA reveals the existence of *Myotis alcathoe* in France (Chiroptera: Vespertilionidae). - Rev. Suisse Zool., **109**: 643-652.

SCHOBER W., GRIMMBERGER E. 1998. Die Fledermäuse Europas. Kosmos Naturführer. Stuttgart, 265 pp.

SPITZENBERGER F. 1996. Distribution and subspecific variation of *Myotis blythi* and *Myotis myotis* in Turkey (Mamm., Vespertilionidae). - Ann. Naturhist. Mus. Wien, **98** (B): 9-23.

SPITZENBERGER F., HARING E., TVRTKOVIĆ N. 2002. *Plecotus microdontus* (Mammalia, Vespertilionidae), a new bat species from Austria. – Natura Croat., **11**: 1–18.

SPITZENBERGER F., PIÁLEK J., HARING E. 2001. Systematics of genus *Plecotus* (Mammalia, Vespertilionidae) in Austria based on morphometric and molecular investigations. – Folia Zool., **50**: 161–172.

VAN DER WAL A., WILLEMSEN J., DE WIT J. (eds). 2003. Mammal survey Eastern Rhodopes (Bulgaria). Veldwerkgroep VZZ, Arnhem, 68 pp. (unpubl. report).

VASILEVA S., TODOROVA S. 1994. [The wealth of one South region. Publ. Rodopi, Kardjali], 86 pp. (In Bulgarian).

VOHRALÍK V., SOFIANIDOU T. 1992. Small mammals (Insectivore, Rodentia) of Thrace, Greece. – Acta Univ. Carol., Biol., **36**: 341-369.

Appendix I
List of material

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

New data: (3) BG: Lozen, art. gallery: 12.4.1998, 6 ind., V, BP. **(5) BG**: Kobilyane, Vodnata Peshtera Cave: 12.2.1998, 2 ind., V. **(6) BG**: Dazhdovnitsa, Hasarskata Peshtera Cave: 18.11.1991, 15 ind., V; 23.9.1996, 4 ind., V. **(9) BG**: Shiroko Pole, Karangil Cave: 1.4.1992, 1 ind., V, BP. **(10) BG**: Visoka Polyana, Yarasa Ini Cave: 31.3.1991, 2 ind., V, BP; 31.3.1992, 20 ind., V, BP; 14.3.2000, 1 ind., V. **(12) BG**: Madrets, Maarata Cave: 10.10.1995, 10 ind., V, BP. **(13) BG**: Byala Polyana, Manaf Koyusyu Cave: 8.2.1998, 5 ind., V. **(14) BG**: Byal Kladenets, Karadjainler: 10.10.1995, 2 ind.,V,.BP; 5.5.1996, 1 ind., V; 10.10.1998, 5ind., V. **(16) BG**: Byal Kladenets, Golyamata Peshtera Cave: 3.3.1999, 3 ex, V. **(18) BG**: Svetoslav, rocky niche: 3.3.1999, 1 ind., V. **(19) BG**: Dolno Cherkovishte,

Zandana Cave, 13.2.1996; 21.4.1996, 1 ind., V, BP; 27.4.1996, 10 ind., V; 29.4.1997, 1 ind., V; 8.2.1998, 12 ind., V. **(20) BG**: Oreshari, Gouk In Cave: 13.2.1996, 1 ind., V; 21.4.1996, 1 ind., V, BP; 27.4.1996, 2 ind. V. **(22) BG**: Oreshari, Karangin Cave: 27.4.1996, 1 ♂ ind., MN,TI. **(25) BG**: Madjarovo, gallery No1: 9.7.1995, 1 ind., MN. **(27) BG**: Madjarovo, gallery No3: 3.4.1992, 2 ind., V, BP. **(34) BG**: Gaberovo, caves in Gyurgen-Dere Valley (1, 3, 4): 13.7.1997, 330 ind. nursery colony, V; 14.4.1998, 3 ind., V, BP; 19.5.1998, 80 ind., V, BP; 14.6.1998, 200 ind., V; 19.7.1998, 150 ind., V. **(38) BG**: Ivaylovgrad Dam, Electric power station: 5.7.1995,1 ind.,V. **(40) BG**: Ivaylovgrad, Dupkata Cave: 27.4.1995, 1 ind., V, BP; 16.2.1996, 4 ind., V; 23.4.1996, 1 ind., V, BP. **(42) BG**: Tarnovtsi, Karaguk Cave: 24.10.1995, 1 ind., V. **(47) BG**: Belopolyane, Belopolyanskata Peshtera Cave: 27.4.1995, 2 ind., V, BP; 23.4.1996, 3 ind., V,BP; 5.7.1995, 3 ♂♂ ind., MN. **(48) BG**: Kostilkovo, building: 17.6.1998, 1 ind., V. **(52) BG**: Beli Dol, caves (1, 2): 15.4.1998, 4 ind.,V, BP. **(53) BG**: Beli Dol, Mechkina Dupka Cave: 24.4.1995, 1 ind., V, BP; 22.4.1996, 1 ind., V, BP. **(55) BG**: Strazhets, building: 23.4.1995, 2ind., V, BP. **(57) BG**: Ribino, Kondjalar Cave: 23.9.1996, 1 ind., MN. **(58) BG**: Ribino, Ayna Ini Cave: 11.10.1995, 20 ind., V, BP; 22.10.1995, V; 9.2.1998, 2 ind., V, BP. **(59) BG**: Ribino, Brashlyanovata Cave: 2.1.1997, 3 ind., V; 18.10.1997, 2 ind., V; 30.12.1999, 3 ind., V. **(60) BG**: Ribino, Prilepnata Cave: 22.7.2002, ca. 30, V, VZZ. **(61) BG**: Ribino, Samara Cave: 20.4.1995, 10 ind., MN, BP; 7.7.1995, 2 ind., MN; 22.10.1995, 3 ind., V; 1.5.1996, 2 ind., V; 21.9.1996, 1 ind., MN; 2.1.1997, 160 ind., V; 18.10.1997, 95 ind., V; 18.5.1998, 5 ind., V, BP; 11.10.1998,1 ind., V; 5.11.1998, 29 ind., V; 4.3.1999, 110 ind., V; 30.12.1999, 140 ind., V; 9.2.1998, 170 ind., V, BP. **(65) GR**: Koufovouno, Cave of Koufovouno: 25.1.1999, 200 ind., V; 2.3.1999, 140 ind., V; 30.6.1999, 70 ind., V, TI. **(67) GR**: Dadia, galleries Tsoutourou: 24.1.1999, 4 ind., V; 18.6.1999, 3 ind., V. **(68) GR**: Dadia, galleries Saint Barabara: 19.7.1997, 2 ind., V; 24.1.1999, 33 ind., V; 22.6.1999, 2 ind., V. **(69) GR**: Kotronia, gallery: 26.1.1999, 2 ind., V. **(74) GR**: Dadia, Kamilata Cave: 25.1.1999, 3 ind., V. **(75) GR**: Lefkimi, Bouba Lefkimis Cave: 27.1.1999, 3 ind., V. **(86) GR**: Maronia, Cave of the Cyclops: 30.1.1999, 200 ind., V.

Literature data: (40) BG: Ivaylovgrad, Dupkata Cave (BERON, 1994). **(64) GR:** Didimotichon (= Didimotiho, cave): 8 ind. (KRYŠTUFEK, 1993; HANÁK et al., 2001); 21.6.1994, colony ca. 300 ind.; 22.7.2000, colony (HANÁK et al., 2001); **(65) GR**: Koufovouno, Cave of Koufovouno: 8-9.6.1965 (HURKA, 1972; KOCK, 1974; HANÁK et al., 2001); 3.8.1971, ca. 200 ind. (NIETHAMMER, 1974; KOCK, 1974; HANÁK et al., 2001); 23.7.1997, 150 ind., V (IVANOVA, 2000; HANÁK et al., 2001). **(74) GR**: Dadia, Kamilata Cave: 18.7.1997, 1 ind., V (IVANOVA, 2000; HANÁK et al., 2001); Dadia Forest Reserve (ADAMAKOPOULOS et al., 1995; HANÁK et al., 2001). **(81) GR**: Avas, Avantos cave (ILIOPOULOU-GEORGUDAKI, 1977, 1983; ILIOPOULOU-GEORGUDAKI & ONDRIAS 1986; HANÁK et al., 2001).

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

New data: (3) BG: Lozen, gallery: 12.4.1998, 1 ind., V, BP. **(4) BG**: Byal Izvor, Djin Gugu Cave: 12.2.1998, 1 ind., V. **(5) BG**: Kobilyane, Vodnata Peshtera Cave: 12.2.1998, 7 ind., V. **(10) BG**: Visoka Polyana, Yarasa Ini Cave: 31.3.1992, 1 ind., V, BP; 5.1.1997, 3 ind., V; 14.3.2000, 1 ind., V. **(13) BG**: Byala Polyana, Manaf Koyusyu Cave: 8.2.1998, 8 ind., V. **(14) BG**: Byal Kladenets, Karadjainler Cave: 5.5.1996, 1 ind., V; 10.10.1998, 1

ind., V. **(15) BG**: Byal Kladenets, Malkata Peshtera Cave: 5.5.1996, 1 ind., V. **(16) BG**: Byal Kladenets, Golyamata Peshtera Cave: 5.5.1996, 1 ind., V. **(17) BG**: Studen Kladenets Dam, tunnel in the dam wall: 4.5.1996, 30 ind., V. **(18) BG**: Svetoslav, rocky niche: 3.3.1999, 2 ind., V. **(19) BG**: Dolno Cherkovishte, Zandana Cave: 21.4.1996, 1 ind., V, BP; 8.2.1998, 6 ind., V. **(20) BG**: Oreshari, Gouk In Cave: 27.4.1996, 2 ind. V; 8.2.1998, 2 ind., V. **(26) BG**: Madjarovo, gallery №2: 11.2.1996, 1 ind., V. **(27) BG**: Madjarovo, gallery №3: 20.4.1996, 2 ind., V, BP; 13.4.1998, 1 ind., MN, BP. **(28) BG**: Madjarovo, Peshter-Dere Valley: 13.4.1998, 3 ind., V, BP. **(30) BG**: Madjarovo, electric post: 14.6.1996, 6 ind., V. **(31) BG**: Madjarovo, NICCER, building: 5.6.1996, 4 ind., V; 18.7.1996, 6 ind., V; 13.7.1997, 5 ind., V; 17.6.1998, 5 ind., V; 7.6.1999, 10 ind., V; 2.7.1999, 14 ind., V; 25.7.1999, 15 ind., V. **(32) BG**: Madjarovo, gallery №5: 12.2.1996, 5 ind., V. **(38) BG**: Ivaylovgrad Electric power station: 5.7.1995, 20 ind.,V; 21.9.1996, 10 ind., V. **(39) BG**: Ivaylovgrad Dam, buildings: 21.9.1996, 1 ind., V. **(40) BG**: Ivaylovgrad, Dupkata Cave: 5.4.1992, 1 ind., V, BP. **(42) BG**: Tarnovtsi, Karaguk Cave: 26.4.1996, 2 ind., V, BP. **(45) BG**: Tatul, cave: 3.2.1989, 1 ind., V. **(47) BG**: Baloplyane, Beloplyanskata Peshtera Cave: 23.4.1996, 1 ind., V, BP. **(51) BG**: Zhalti Chal, buildings: 10.6.1996, 4 ind., V. **(53) BG**: Beli Dol, Mechkina Dupka Cave: 24.4.1995, 1 ind., V, BP. **(57) BG**: Ribino, Kondjalar Cave: 7.7.1995, 5 ind., V. **(58) BG**: Ribino, Ayna Ini Cave: 9.2.1998, 1 ind., V, BP; 4.3.1999, 1 ind., V. **(59) BG**: Ribino, Brashlyanovata Cave: 22.10.1995, 1 ind., V; 2.1.1997, 3 ind., V; 18.10.1997, 2 ind., V; 30.12.1999, 1 ind., V; 22.7.2002, 1 ind., V, VZZ. **(61) BG**: Ribino, Samara Cave: 1.4.1995, 3 ind., V, PB; 20.4.1995, 1 ind., V, BP; 1.5.1996, 1 ind., V; 2.1.1997, 1 ind., V; 18.10.1997, 4 ind., V; 9.2.1998, 15 ind., V, BP; 18.5.1998, 2 ind., V, BP; 11.10.1998,1 ind., V; 4.3.1999, 4 ind., V; 30.12.1999, 3 ind., V. **(62) BG**: Kremen, cave: 20.7.1996, 1 ind., V. **(63) BG**: Kremen, Golyamata Peshtera Cave: 20.7.1996, 1 ind., V. **(66) GR**: Giannouli, military bunker: 24.6.1999, 5 ind., V. **(67) GR**: galleries Tsoutourou: 24.1.1999, 2 ind., V.

Literature data: (8) BG: Ostrovitsa, Tilki Ini Cave: 15.7.1962 (BERON & GUEORGUIEV, 1967); **(40) BG**: Ivaylovgrad, Dupkata Cave (NOWOSAD et al., 1987).). **(74) GR**: Dadia Forest Reserve (ADAMAKOPOULOS et al., 1995; HANÁK et al., 2001). **(67) GR**: galleries Tsoutourou: 18.7.1997, 1 ind., V (IVANOVA, 2000; HANÁK et al., 2001); **(83) GR**: Alexandroupoli: 21.5.1962 (KANELLI & HATZISARANTOU, 1963; HANÁK et al., 2001), 1 ind. (HANÁK et al., 2001).

***Rhinolophus euryale* Blasius, 1853**

New data: (1) BG: Spahievo, gallery: 14.7.1986, 1 ind., MN, IH. **(10) BG**: Visoka Polyana, Yarasa Ini Cave: 11.7.1995, 4 ind., V. **(13) BG**: Byala Polyana, Manaf Koyusyu Cave: 4.1.1997, 20 ind., V; 8.2.1998, 15 ind., V. **(19) BG**: Dolno Cherkovishte, Zandana Cave: 21.4.1996, 4 ind., V, BP; 29.4.1997, 4 ind., V; 8.2.1998, 10 ind., V. **(27) BG**: Madjarovo, gallery №3: 11.5.1996, 1 ind., MN, BP; 13.4.1998, 1 ind., MN, BP; 16.5.1998, 1 ind., MN, BP; 20.4.1996, 10 ind., V, BP. **(32) BG**: Madjarovo, gallery №5: 11.2.1996, 1 ind., V. **(34) BG**: Gaberovo, cave №1 in Gyurgen-Dere Valley: 13.7.1997, 20 ind., V. **(58) BG**: Ribino, Ayna Ini Cave: 8.7.1995, 360 ind., V; 22.10.1995, ?, V; 1.5.1996, 360 ind., V; 11.6.1996, 5 ind., TT; 2.1.1997, 430 ind., V; 14.7.1997, 1750 ind., V; 22.7.1998, 550 ind., V; 18.11.1997, 430 ind., V; 9.2.1998, 360 ind., V, BP; 18.5.1998, 200 ind., V, BP; 11.10.1998, 10 ind., V; 4.3.1999, 180 ind., V; 4.7.1999, 700 ind., V; 30.12.1999, 700 ind., V; 11.9.2000,

1000 ind., V, MN; 9.9.2001, 1300 ind., V. **(61) BG**: Ribino, Samara Cave: 20.4.1995, 7 ind., MN, BP; 7.7.1995, 6 ind., MN; 11.10.1995, 2 ind., V, BP; 1.5.1996, 1 ind., V; 21.9.1996, 15 ind., MN; 9.2.1998, 300 ind., V, BP; 18.5.1998, 2 ind., V, BP; 4.3.1999, 120 ind., V. **(67) GR**: galleries Tsoutourou: 18.6.1999, 900 ind., V. **(74) GR**: Dadia, cave Kamilata Cave: 19.6.1999, 60 ind., V. **(86) GR**: Maronia, Cave of the Cyclops: 31.1.1999, 1500 ind., V; 26.6.1999, 50 ind. nursery colony, V; 26.9.2000, 60 ind., V, BP.

Literature data: (64) GR: Didimotichon (= Didimotiho): 3.8.1971 (KOCK, 1974; HANÁK et al., 2001). **(67) GR**: galleries Tsoutourou: 19.7.1997, 10 ind., V (IVANOVA, 2000; HANÁK et al., 2001); **(75) GR**: Lefkimi, cave: 28.7.1987, 11 ind. (CRUCITTI, 1988; HANÁK et al., 2001); Bouba Lefkimis Cave: 24.7.1997, 250 ind. nursery colony, V (IVANOVA, 2000; HANÁK et al., 2001). **(81) GR**: Avas, cave Avantos (ILIOPOULOU-GEORGUDAKI, 1977, 1983; HANÁK et al., 2001).

***Rhinolophus mehelyi* Matschie, 1901**

New data: (13) BG: Byala Polyana, Manaf Koyusyu Cave: 8.2.1998, 1 ind., V. **(58) BG**: Ribino, Ayna Ini Cave: 23.9.1996, 1 ind., V; 11.9.2000, 10 ind. nursery colony; **(61) BG**: Ribino, Samara Cave: 7.7.1995, 1 ind., MN. **(86) GR**: Maronia, Cave of the Cyclops: 26.6.1999, 12 ind. nursery colony, TT; 26.9.2000, 10 ind., V, BP.

Literature data: (64) GR: Didimotichon, cave: 22.6.1989, 3 ♀♀, MN (HANÁK et al., 2001); in owl pellets, 12.9.1990 (VOHRALÍK & SOFIANIDOU, 1992; HANÁK et al., 2001). **(65) GR**: Koufovouno, Cave of Koufovouno: 8-9.6.1965 (HŮRKA, 1972); 3.8.1971, 400 ind. nursery colony (NIETHAMMER, 1974; HANÁK et al., 2001); 16.7.1997, 500 ind. V (IVANOVA, 2000; HANÁK et al., 2001).

***Rhinolophus blasii* Peters, 1866**

New data: (6) BG: Dazhdovnitsa, Hasarskata Peshtera Cave: 18.11.1991, 13 ind., V, M, BP; 23.9.1996, 12 ind., V. **(13) BG**: Byala Polyana, Manaf Koyusyu Cave: 4.1.1997, 25 ind., V; 8.2.1998, 13 ind., V. **(19) BG**: Dolno Cherkovishte, Zandana Cave: 21.4.1996, 6 ind., V, BP; 29.4.1997, 6 ind., V; 8.2.1998, 25 ind., V. **(27) BG**: Madjarovo, gallery №3: 20.4.1996, 6 ind., V, BP; 16.5.1998, 1 ind., MN, BP. **(56) BG**: Malka Chinka, under bridge: 18.5.1998, 2 ind., MN, BP. **(58) BG**: Ribino, Ayna Ini Cave: 8.7.1995, 590 ex., V; 22.10.1995, ?, V; 1.5.1996, 590 ind., V; 11.6.1996, 7 ind. , TT; 14.7.1997, 2950 ind., V; 22.7.1998, 880 ind., V; 18.10.1997, 700 ind., V; 9.2.1998, 590 ind., V, BP; 18.5.1998, 350 ind., V, BP; 4.3.1999, 300 ind., V; 4.7.1999, 1200 ind., V; 30.12.1999, 1200 ind., V. **(61) BG**: Ribino, Samara Cave: 7.7.1995, 8 ind., MN; 11.10.1995, 1 ind., V, BP; 21.9.1996, 16 ind., MN; 9.2.1998, 470 ind., V, BP; 4.3.1999, 190 ind., V. **(86) GR**: Maronia, Cave of the Cyclops: 26.6.1999, 70 ind., nursery colony, V, TT; 26.9.2000, 80 ind., V, BP.

Literature data: (42) BG: Tarnovtsi, Karaguk Cave: 8.10.1960 (GUEORGUIEV & BERON, 1962). **(74) GR**: Dadia Forest Reserve (ADAMAKOPOULOS et al.,1995; HANÁK et al., 2001). **(81) GR**: Avas, road 2 km S, 20.6.1989, 1 ♀ ad MN (HANÁK et al., 2001).

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

(the size of the mixed with *M. blythii* colonies is shown in brackets)

New data: (9) BG: Shiroko Pole, Karangil Cave: 1.8.1995, 5 ind., V, BP. **(10) BG**: Visoka Polyana, Yarasa Ini Cave: 31.3.1991, 500 ind., V, BP; 16.11.1991, 100 ind., V;

31.3.1992, 500 ind., V, BP; 11.7.1995, 8000 ind., V; 12.8.1995, 3500 ind., V, BP; 19.10.1995, 200 ind., V; 6.5.1996, 2500 ind., V; 18.9.1996, 1500 ind., V; 28.4.1997, 7000 ind., V; 15.7.1997, 10000 ind., V; 17.5.1998, 2000 ind., V; 23.7.1998, 3000 ind., V; 5.7.1999, 10 ind., V. **(11) BG**: Visoka Polyana, Gyumbyurdek Ini Cave: 7.5.1998, 10 ind., V, BP; 22.7.1998, 1 ind., MN. **(12) BG**: Madrets, Maarata Cave: 10.101995, 1 ind., V, BP. **(20) BG**: Oreshari, Gouk In Cave: 8.2.1998, 1 ind., M. **(22) BG**: Oreshari, Karangin Cave: 20.10.1995, 17 ind., MN; 27.4.1996, 28 ind., MN; 17.9.1996, 2 ind., MN; 29.4.1997, 1500 ind., V; 14.7.1997, ?, V; 17.5.1998, 700 ind., V; 17.6.1998, 500 ind., V; 20.7.1998, 550 ind., V; 11.4.1999, 1000 ind., V; 10.6.1999, 700 ind., V; 3.7.1999, 900 ind., V. **(27) BG**: Madjarovo, gallery №3: 8.2.1998, 1 ind., V, BP. **(38) BG**: Ivaylovgrad Elactric power station: 5.7.1995, 1 ind., V; 21.9.1996, 2 ind., V. **(58) BG**: Ribino, Ayna Ini Cave: 11.10.1995, 300 ind., V, BP; 22.10.1995, ?, V; 1.5.1996, 3000, V; 11.6.1996, 32 ind., TT; 14.7.1997, 3000 ind., V; 18.10.1997, 20 ind., V; 18.5.1998, 1000 ind., V, BP; 22.7.1998, 250 ind., V; 11.10.1998, 20 ind., TT; 4.7.1999, 2000 ind., V. **(60) BG**: Ribino, Prilepnata Cave: 2.1.1997, 1 ind., V. **(61) BG**: Ribino, Samara Cave: 1.4.1995, 15 ind., V, PB; 20.4.1995, 2 ind., MN, BP; 7.7.1995, 4 ind., MN; 11.10.1995, 10 ind., V, BP; 21.9.1996, 1 ind., MN; 2.1.1997, 30 ind., V; 18.10.1997, 30 ind., V; 9.2.1998, 40 ind., V; 18.5.1998, 5 ind., V, BP; 4.3.1999, 40 ind., V; 30.12.1999, 35 ind., V. **(65) GR**: Koufovouno, Cave of Koufovouno: 23.7.1997, (600) ind., V; 25.1.1999, 2 ind., V; 30.6.1999, (1000) ind., V. **(86) GR**: Maronia, Cave of the Cyclops: 26.7.1997, (3500) ind. nursery colony, V; 30.1.1999, (40) ind. nursery colony, V; 26.6.1999, (2000) ind., V.

Literature data: (10) BG: Visoka Polyana, cave Yarasa Ini Cave (BESHKOV, 1998). **(65) GR**: Koufovouno, Cave of Koufovouno: 21.6.1994, ca. 50 ind., V; 22.7.2000, 2 ♂♂, MN (HANÁK et al., 2001). **(74) GR**: Dadia Forest Reserve (ADAMAKOPOULOS et al., 1995; HANÁK et al., 2001). **(75) GR**: Lefkimis, Bouba Lefkimis Cave: 24.7.1997 (IVANOVA, 2000; HANÁK et al., 2001). **(77) GR**: Provatonas, big rocky niche: 21.7.1997, 1 ♂, MN (IVANOVA, 2000; HANÁK et al., 2001).

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

(the size of the mixed with *M. myotis* colonies is shown in brackets)

New data: (65) GR: Koufovouno, Cave of Koufovouno: 23.7.1997, (600) ind., V; 25.1.1999, 2 ind., V; 30.6.1999, (1000) ind., V. **(67) GR**: galleries Tsoutourou: 19.7.1997, 500 ind. nursery colony, V; 18.6.1999, 200 ind. nursery colony, V. **(68) GR**: Dadia, galleries Saint Barbara: 22.6.1999, 15 ind., MN. **(86) GR**: Maronia, Cave of the Cyclops: 26.7.1997, (3500) ind. nursery colony, V; 30.1.1999, (40) ind. nursery colony, V; 26.6.1999, (2000) ind., V.

Literature data: (64) GR: Didimotichon, cave 2 km W: 22.6.1963 (HŮRKA, 1972; HANÁK et al., 2001); 23.6.1989, 1 ♂ ad, MN (HANÁK et al., 2001); 12.9.1970, 1 ind. in owl pellet (VOHRALÍK & SOFIANIDOU, 1992; HANÁK et al., 2001). **(65) GR**: Koufovouno, Cave of Koufovouno: 22.6.1963, 2 ♂♂, 6 ♀♀ ind. (SPITZENBERGER, 1996; HANÁK et al., 2001); 3.8.1971, (800) ind., nursery colony (NIETHAMMER, 1974; HANÁK et al., 2001); 23.6.1989, colony, V; 22.7.2000, 28 ind., MN (HANÁK et al., 2001). **(67) GR**: galleries Tsoutourou: 24.7.2000, 41 ind. (HANÁK et al., 2001). **(68) GR**: Dadia, galleries Saint Barbara: 19.7.1997, 2 ♂♂, obs. ca. 10 ind., V (IVANOVA, 2000; HANÁK et al., 2001). **(77) GR**: Provatonas, Rocky niche: 21.7.1997, 4 ind., MN (IVANOVA, 2000; HANÁK et al., 2001).

Myotis bechsteinii **(Kuhl, 1817)**

New data: (61) BG: Ribino, Samara Cave: 20.4.1995, 1 ♂ ind., MN, BP. **(74) GR**: Dadia, Kamilata Cave: 19.6.1999, 1 ♂ ind., MN.

Myotis emarginatus **(Geoffroy, 1806)**

New data: (34) BG: Gaberovo, caves in Gyurgen-Dere Valley (1, 3): 13.7.1997, 7000 ind. nursery colony, V; 19.5.1998, 50 ind., V; 14.6.1998, 500 ind., V; 19.7.1998, 500 ind., V. **(58) BG**: Ribino, Ayna Ini: 11.6.1996, 2 ind., TT. **(61) BG**: Ribino, Samara Cave: 1.4.1995, 1 ind., V, PB; 20.4.1995, 1 ind., V, BP; 18.10.1997, 1 ind., V; 18.5.1998, 1 ind., V, BP; 30.12.1999, 3 ind., V. **(74) GR**: Dadia, Kamilata Cave: 19.6.1999, 2 ind., MN.

Literature data: (74) GR: Dadia, Kamilata Cave: 24.7.1997, 1 ind., MN (IVANOVA, 2000; HANÁK et al., 2001). **(75) GR**: Lefkimi, cave: 28.7.1987 (CRUCITTI, 1988; HANÁK et al., 2001). **(77) GR**: Provatonas, rocky niche: 17.7.1997, 2 ind., MN (IVANOVA, 2000; HANÁK et al., 2001). **(81) GR**: Avas, cave Avantos (ILIOPOULOU-GEORGUDAKI, 1977, 1983; HANÁK et al., 2001).

Myotis capaccinii **(Bonaparte, 1837)**

New data: (3) BG: Lozen, gallery: 12.4.1998, 1 ind., V. **(10) BG**: Visoka Polyana, Yarasa Ini Cave: 31.3.1991, 10 ind., V, BP; 16.11.1991, 100 ind., V; 12.8.1995, 100 ind., V, BP; 19.10.1995, 130 ind., V; 6.5.1996, V; 18.9.1996, 200 ind., V; 5.1.1997, 20 ind., V; 28.4.1997, V; 15.7.1997, 500, V; 18.10.1997, 100 ind., V; 17.5.1998, 500 ind., V; 23.7.1998, 1000 ind., V; 13.10.1998, 250 ind., V; 5.7.1999, 9000 ind., V; 25.7.2002, >1000 ind., V, VZZ. **(22) BG**: Oreshari, Karangin Cave: 27.4.1996, 12 ind., MN; 17.9.1996, 1 ind., MN; 29.4.1997, V; 14.7.1997, V; 17.5.1998, V; 17.6.1998, V; 20.7.1998, 10 ind., MN; 11.4.1999, 130 ind., V; 3.7.1999, 50 ind., V. **(27) BG**: Madjarovo, gallery №3: 11.5.1996, 1 ind., MN, BP. **(58) BG**: Ribino, Ayna Ini Cave: 22.7.1998, 20 ind., V; 4.3.1999, 3 ind., V. **(61) BG**: Ribino, Samara Cave: 22.7.2002, 3 ind., V. **(65) GR**: Koufovouno, Cave of Koufovouno: 25.1.1999, 20 ind., V; 30.6.1999, V. **(68) GR**: galleries Saint Barbara: 24.1.1999, 4 ind., V. **(71) GR**: Dadia, over Diavolorema River, NW of Dadia: 17.6.1999, 1 ind., MN. **(75) GR**: Lefkimi, Bouba Lefkimis Cave: 25.6.1999, 250 ind., nursery colony, V. **(86) GR**: Maronia, Cave of the Cyclops: 26.6.1999, 200 ind., nursery colony, V.

Literature data: (64) GR: Didimotichon, cave: 22.6.1963 (HURKA, 1972; HANÁK et al., 2001); 22.6.1989, 1 Mjuv, 6 ♀♀ ad, MN; 21.6.1994, 2 ind., V; 22.7.2000, colony (HANÁK et al., 2001). **(65) GR**: Koufovouno, Cave of Koufovouno: 8-9.6.1963 (HURKA, 1972; HANÁK et al,. 2001); 3.8.1971, 100 ind., nursery colony (NIETHAMMER, 1974; KOCK, 1974; HANÁK et al., 2001); 23.7.1997, 300 ind., nursery colony, V (IVANOVA, 2000; HANÁK et al., 2001). **(67) GR**: galleries Tsoutourou: 19.7.1997, 100 ind., V (IVANOVA, 2000; HANÁK et al., 2001); 24.7.2000 (HANÁK et al., 2001). **(72) GR**: Dadia, over Diavolorema River: 22.7.1997, 1 ♂ juv., MN (IVANOVA, 2000; HANÁK et al., 2001). **(75) GR**: Lefkimi, Bouba Lefkimis Cave: 24.7.1997, 150 ind., V (IVANOVA, 2000; HANÁK et al., 2001). **(82) GR**: Kirki, over river: 21.7.2000, 1M, MN (HANÁK et al., 2001).

Myotis daubentonii **(Kuhl, 1817)**

New data: (1) BG: Spahievo, galleries in the hill Aida: 14.7.1986, 1 ♂ ind., MN, (IH). **(49) BG**: Dolno Lukovo, over Byala Reka River: 11.6.1999, 3 ♀♀ ad, 1Mjuv, MN, BP.

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

New data: (1) BG: Spahievo, gallery, 14.7.1986, 3 ♂♂ ind., MN, (IH). **(2) BG**: Knizhovnik, over a bridge, 21.7.1986, 1 ♀ ind., MN, (IH). **(36) BG**: Malki Voden, building: 25.7.2002, nursery colony ca. 200 ind., V, M, VZZ. **(37) BG**: Dabovets, over Dalbokata River, 30.6.1983, 1 ♀ ind., MN, (IH).

Literature data: (80) GR: Esimi, building, 21.8.1984 (CRUCITTI, 1988; IVANOVA, 2000; HANÁK et al., 2001); **(84) GR**: Makri, 2 km W, 2.10.1966 (HURKA, 1972; HANÁK et al., 2001).

Myotis aurascens **Kusjakin, 1935**

Literature data: (44) BG: Momchilgrad: 2 ♀♀ (BENDA & TSYTSULINA, 2000).

Nyctalus noctula **(Schreber 1774)**

New data: (22) BG: Meden Buk, over Byala Reka River: 7.6.1996, 2 ♂♂, MN; 16.6.1998, 1 ♂, MN; 23.7.2002, 1 ♂, MN, VZZ. **(71) GR**: Dadia, over Diavolorema River NW of Dadia: 17.6.1999, 1 ♂, MN. **(72) GR**: Dadia, over Diavolorema River: 16.6.1999, 1 ♂, MN.

Literature data: (64) GR: Didimotichon, cave, in *Tyto alba* pellets: 21.6.1994 (HANÁK et al., 2001). **(74) GR**: Dadia, Dadia Forest Reserve (ADAMAKOPOULOS et al., 1995; HANÁK et al., 2001). **(78) GR**: Provatonas, over Provatonas River: 21.7.1997, 2M, MN (IVANOVA, 2000; HANÁK et al., 2001).

Nyctalus leisleri **(Kuhl, 1817)**

Literature data: (71) GR: Dadia, over Diavolorema River NW of Dadia: 19.7.1997, 1 ♂, MN (IVANOVA, 2000; HANÁK et al., 2001).

Nyctalus lasiopterus **(Kuhl, 1817)**

New data: (50) BG: Meden Buk, over Byala Reka River: 23.7.2002, 1 ♂, MN, VZZ.

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

New data: (22) BG: Oreshari, Karangin Cave: 17.9.1996, 1M, MN. **(34) BG**: Gaberovo, Gyurgen-Dere Valley, Cave №1: 7.10.1998, 1 ♀, MN. **(37) BG**: Dabovets, over Dalbokata Reka River: 29.6.1983, 11 ind. (1 ♂, 10 ♀♀), MN, IH. **(41) BG**: Ivaylovgrad, building: 5.7.1995, V. **(43) BG**: Momchilgrad, over water: 18.6.1977, 4 ind.(2 ♂♂, 2 ♀♀), MN, IH. **(44) BG**: Momchilgrad: 19.6.1977, 1 ♀, MN, IH. **(49) BG**: Dolno Lukovo, over Byala Reka River: 11.6.1999, 1 ♀, MN, BP. **(50) BG**: Meden Buk, over Byala Reka River: 7.6.1996, 1 ♂, MN. **(70) GR**: Kotronia, over Diavolorema River: 16.6.1999, 1 ♂, MN. **(76) GR**: Lira, pond: 18.6.1999, 3 ♂♂, MN.

Literature data: (7) BG: Kardjali: 15.10.27 (HANÁK & JOSIFOV, 1959). **(72) GR**: Dadia, over Diavolorema River: 22.7.1997, 1 ♂, MN (IVANOVA, 2000; HANÁK et al., 2001). **(74) GR**: Dadia, Kamilata Cave: 24.7.1997, 1 ♂, MN (IVANOVA, 2000; HANÁK et al., 2001); Dadia Forest Reserve (ADAMAKOPOULOS et al., 1995; IVANOVA, 2000; HANÁK et al., 2001). **(77) GR**: Provatonas, rocky niche: 21.7.97, 3 ♂♂, MN (IVANOVA, 2000; HANÁK et al., 2001). **(83) GR**: Alexandroupoli (KANNELI & HATZISARANTOU, 1963).

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

New data: (23) BG: Dolni Glavanak, building: 27.7.2002, 1 ♂ juv, 1 ♀ ad post-lactating, nursery colony, V, M, BD (45 kHz), VZZ. **(24) BG**: Strandjevo, buildings: 25.7.2002, two colonies, V, BD (45 kHz), VZZ. **(30) BG**, Madjarovo, building: 24.11.01, 1 ♂, M, BD (45 kHz); 5.5.03, 1 ♂ ad, M, BD (45 kHz); electric power pole: 25.7.2002, ca. 40, V, BD (45 kHz), VZZ. **(39) BG**: Ivaylovgrad Dam, building: 5.7.1995, 40 ind., V, BD(45 kHz); 10.7.1995, 40 ind. nursery colony (8 ♀♀, 1 ♀ juv, 2 ♂♂ juv), MN (45 kHz); 10.7.1995, 150 ind., V, BD (45 kHz); 2.5.96, 92 ind., V, BD (45 kHz).

Pipistrellus pygmaeus **(Leach, 1825)**

Literature data: (31) BG: Madjarovo, NICCIR, under the bark of withered *Quercus* sp.: 12.9.2001, 1 ♂, M (DIETZ et al., 2002).

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

Literature data: (71) GR: Dadia, over Diavolorema River, forest of *Alnus* sp.: 19.7.1997, 1 ♂, MN (IVANOVA, 2000; HANÁK et al., 2001). **(74) GR**: Dadia Forest Reserve (ADAMAKOPOULOS et al., 1995; HANÁK et al., 2001).

Pipistrellus kuhlii **(Kuhl, 1817)**

Literature data: (74) GR: Dadia Forest Reserve (ADAMAKOPOULOS et al., 1995; HANÁK et al., 2001).).

Hypsugo savii **(Bonaparte 1837)**

New data: (11) BG: Visoka Polyana, Gyumbyurdek Ini Cave: 22.7.1998, 1 ind., MN. **(22) BG**: Oreshari, Karangin Cave: 17.9.1996, 1 ♂, MN. **(27) BG**: Madjarovo, gallery №3: 11.5.1996, 1 ♀, MN, BP; 13.4.1998, 1 ♂, MN, BP. **(57) BG**: Ribino, Kondjalar Cave: 23.9.1996, 1 ♂, MN. **(72) GR**: Dadia, over Diavolorema River: 16.6.1999, 7 ♀♀, MN. **(73) GR**: Dadia, rocky hill SW of Dadia: 14.6.1999, 1 ♀, MN.

Literature data: (72) GR: Dadia, over Diavolorema River: 19.7.1997, 2 ♀♀ juv, 1 ♂ juv, MN (IVANOVA, 2000; HANÁK et al., 2001). **(74) GR**: Dadia, Kamilata Cave: 24.7.1997, 6 ♂♂, MN (IVANOVA, 2000; HANÁK et al., 2001). **(78) GR**: Provatonas, over Provatonas River: 21.7.1997, 6 juv, MN (IVANOVA, 2000; HANÁK et al., 2001).

Eptesicus serotinus **(Schreber 1774)**

New data: (22) BG: Oreshari, Karangin Cave: 20.7.1998, 1 ♂, MN. **(46) BG**: Tatul, volcanic cave: 3.5.1996, 1♂, M. **(72) GR**: Dadia, over Diavolorema River: 16.6.1999, 2 ♂♂, MN; 17.6.1999, 1♂, MN. **(74) GR**: Dadia, Kamilata Cave: 19.6.1999, 2 ♀♀, 2 ♂♂, MN.

Literature data: (72) GR: Dadia, over Diavolorema River: 19.7.1997, 1 ♀ lactating, MN (IVANOVA, 2000; HANÁK et al., 2001). **(74) GR**: Dadia, Kamilata Cave: 24.7.1997, 1 ♂, MN (IVANOVA, 2000; HANÁK et al., 2001); Dadia Forest Reserve (ADAMAKOPOULOS et al., 1995; HANÁK et al., 2001). **(78) GR**: Provatonas, over Provatonas River: 21.7.1997, 1 ♀ lactating, nursery colony ca. 20 in rocky fissure, MN (IVANOVA, 2000; HANÁK et al., 2001). **(85) GR**: Maronia, creek 2 km SW: 19.6.1989, 1 ♂ ad (HANÁK et al., 2001).

Plecotus austriacus **(Fischer, 1829) s. l.**

New data: (21) BG: Oreshari, Bliznatsite Cave: 10.6.1999, 1 ♂, MN. **(68) GR**: Dadia, galleries Saint Barbara: 24.1.1999, 1 ind., V. **(30) BG**: Madjarovo, building in the village: 25.7.2002, 2 ind., V, VZZ. **(35) BG**: Efrem, building in the village, 12 ind., V, VZZ. **(74) GR**: Dadia, Kamilata Cave: 19.6.1999, 1 ind., V.

Literature data: (22) BG: Oreshari, Karangin Cave: 20.10.1995, 7 ♂♂, MN; 17.9.1996, 7 ind. (6 ♂♂, 1 ♀), MN (BENDA & IVANOVA, 2003). **(25) BG**: Stremtsi, art. gallery: 1 ind., V (BENDA & IVANOVA, 2003). **(27) BG**: Madjarovo, gallery No3: 11.5.1996, 1 ♂, MN (BENDA & IVANOVA, 2003). **(32) BG**: Madjarovo, gallery No5: 9.12.2000, 1 ♀, M (BENDA & IVANOVA, 2003). **(34) BG**: Gaberovo, caves in Gyurgen-Dere Valley (1, 3): 7.10.1998, 4 ind. (3 ♂♂, 1 ♀), MN (BENDA & IVANOVA, 2003). **(43) BG**: Momchilgrad, over water: 18.6.1977, 1 ind., MN (BENDA & IVANOVA, 2003). **(61) BG**: Ribino, Samara Cave: 2.1.1997, 2 ind., V (BENDA & IVANOVA, 2003) **(74) GR**: Dadia, Kamilata Cave: 24.7.1997, 1 ♂, MN (IVANOVA, 2000; HANÁK et al., 2001). **(86) GR**: Maronia, Cave of the Cyclops (ILIOPOULOU-GEORGUDAKI, 1983).

Plecotus austriacus **(Fischer, 1829) s. str.**

Literature data: (84) GR: Makri, 1966, 1 ind. (SPITZENBERGER et al., 2001; HANÁK et al., 2001).

Barbastella barbastellus **(Schreber, 1774)**

New data: (54) BG: Gugutka, over Chukurska Reka River: 14.4.1998, 1 ♀, MN, BP.

Miniopterus schreibersii **(Kuhl 1819)**

New data: (10) BG: Visoka Polyana, Yarasa Ini Cave: 31.3.1991, 10 ind., V, BP; 11.7.1995, 1000 ind., V; 12.8.1995, 100 ind., V, BP; 19.10.1995, 250 ind., V; 6.5.1996, 950 ind., V; 18.9.1996, 300 ind., V; 28.4.1997, 1000 ind., V; 15.7.1997, ?, V; 17.5.1998, 700 ind., V; 23.7.1998, 5000 ind., V; 13.10.1998, 10 ind., V; 5.7.1999, 1000 ind., V; 25.7.2002, >2000, V, VZZ. **(22) BG**: Oreshari, Karangin Cave: 20.10.1995, 3 ind., MN; 27.4.1996, 15 ind., MN; 29.4.1997, V; 14.7.1997, V; 17.5.1998, 500 ind., V; 17.6.1998, 500 ind., V; 20.7.1998, 20 ind., MN; 11.4.1999, 370 ind., V; 10.6.1999, 800 ind., V; 3.7.1999, 500 ind., V. **(27) BG**: Madjarovo, gallery №3: 16.5.1998, 1 ind., MN, BP. **(29) BG**: Madjarovo, gallery №4: 12.5.1996, 1 ind., MN, BP. **(58) BG**: Ribino, Ayna Ini Cave: 11.10.1995, 100 ind., V, BP; 22.10.1995, V; 1.5.1996, 500, V; 11.6.1996, 20 ind., TT; 14.7.1997, 1000 ind., V; 18.10.1997, 200 ind., V; 18.5.1998, 100 ind., V, BP; 22.7.1998, 500 ind., V; 11.10.1998, 350 ind., TT; 4.3.1999, 100 ind., V; 4.7.1999, 1000 ind., V; 22.7.2002, ca. 500, V, VZZ. **(61) BG**: Ribino, Samara Cave: 1.4.1995, 100 ind., V, ПБ; 20.4.1995, 2 ind., MN, BP; 11.10.1995, 5 ind., V, BP; 12.6.1996, 3 ind., V; 21.9.1996, 1 ind., V; 4.3.1999, 90 ind., V; 22.7.2002, ca. 50, V, VZZ. **(65) GR**: Koufovouno, Cave of Koufovouno: 25.1.1999, 3500 ind., V; 2.3.1999, 3500 ind., V; 30.6.1999, V. **(86) GR**: Maronia, Cave of the Cyclops: 26.6.1999, 1000 ind., nursery colony, V.

Literature data: (10) BG: Visoka Polyana, Yarasa Ini Cave (BESHKOV, 1998). **(40) BG**: Ivaylovgrad, Dupkata cave: 22.3.1975 (NOWOSAD et al., 1987). **(64) GR**: Didimotichon, cave: 22.6.1963 (HURKA, 1972); 22.6.1989, 1 ♂ ad, 2 ♀♀ ad, MN (HANÁK et al., 2001). **(65) GR**: Koufovouno, Cave of Koufovouno: 8-9.6.1965 (HURKA, 1972);

3.8.1971, 2000 ind., nursery colony (NIETHAMMER, 1974); 23.7.1997, 3500 ind., nursery colony, V (IVANOVA, 2000; HANÁK et al., 2001); 22.7.2000, colony, V (HANÁK et al., 2001). **(67) GR**: galleries Tsoutourou: 22.7.1997, 50 ind., V (IVANOVA, 2000; HANÁK et al., 2001); 24.7.2000, colony (HANÁK et al., 2001). **(75) GR**: Lefkimi, Bouba Lefkimis Cave: 24.7.1997, 200 ind., V (IVANOVA, 2000; HANÁK et al., 2001). **(81) GR:** Avas, road 2 km S: 20.6.1989, 1 ♂, MN (HANÁK et al., 2001). **(86) GR**: Maronia, Cave of the Cyclops: 26.7.1997, 1500 ind., nursery colony, V (IVANOVA, 2000; HANÁK et al., 2001).

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

New data: (33) BG: Madjarovo, rocky cliff Kovan Kaya: 28.7.2002, ca. 20 ind., V, BD, VZZ; 11.9.2002, ca. 20 ind., V, BD; 30.10.2002, ca. 20 ind., V, BD. **(56) BG**: Malka Chinka, 11.9.2000, BD, Bjoern Siemers det.

Literature data: (82) GR: Kirki, river 6 km E: 21.7.2000 (HANÁK et al., 2001).

Authors' address:
Teodora Ivanova, Antoaneta Gueorguieva
National Museum of Natural History
1, Tsar Osvoboditel Blvd.
1000 Sofia, Bulgaria
E-mail: tea@nmnh.bas.bg

Прилепите (Mammalia: Chiroptera) в Източните Родопи (България и Гърция) – видов състав, зоогеографска и фаунистична характеристика

Теодора ИВАНОВА, Антоанета ГЕОРГИЕВА

(Р е з ю м е)

През периода 1995-2002 е проведено проучване върху прилепната фауна на Източните Родопи на територията на България и Гърция. Използвани са улов с орнитологични мрежи и проверка на известни и потенциални убежища (пещери, галерии, постройки и др.). Направена е литературна справка и са представени нови данни за разпространението на 25 вида прилепи от 86 находища: *Rhinolophus ferrumequinum*, *Rh. hipposideros*, *Rh. euryale*, *Rh. mehelyi*, *Rh. blasii*, *Myotis myotis*, *M. blythii*, *M. bechsteinii*, *M. emarginatus*, *M. capaccinii*, *M. daubentonii*, *M. aurascens*, *Nyctalus noctula*, *N. leisleri*, *N. lasiopterus, Pipistrellus pipistrellus*, *P. pygmaeus*, *P. nathusii, P. kuhlii, Hypsugo savii*, *Eptesicus serotinus*, *Plecotus austriacus*, *B. barbastellus*, *Miniopterus schreibersii, Tadarida teniotis.*. Четири вида (*M. bechsteinii*, N. *lasiopterus, B. barbastellus, P. pipistrellus* s.str.) се съобщават за първи път за територията на Източните Родопи. Направена е зоогеографска и фаунистична характеристика на изследваната прилепна фауна.