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First data on bats of the Central Balkan Mts., Bulgaria

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Abstract. The paper provides new data on the occurrence and ecology of bats inhabiting the Central Balkan Mts. in Bulgaria. The study covers the territory of the National Park "Central Balkan" and some adjacent areas. The data referred are results of the first investigation of bats in the area carried out from August to December in 1995–1997 by using mist netting and checking of potential roosts as caves, galleries, buildings, etc. Findings of three bat species (*Rhinolophus ferrumequinum*, *R. hipposideros*, *Barbastella barbastellus*) were reported from the area previously. The occurrence of these species has been confirmed in the present research and 15 species are further recorded for first time. Totally 18 bat species are recorded from 18 localities, situated between 700 m and 1700 m a. s. l.: *Rhinolophus ferrumequinum*, *R. hipposideros*, *Myotis myotis*, *M. blythii*, *M. mystacinus*, *M. brandtii*, *M. daubentonii*, *M. emarginatus*, *M. bechsteinii*, *Barbastella barbastellus*, *Plecotus auritus*, *P. austriacus*, *Pipistrellus pipistrellus*, *Hypsugo savii*, *Vespertilio murius*, *Nyctalus leisleri*, *N. noctula*, *Miniopterus schreibersii*. Short notes concerning roosts and habitat preferences are provided. The conservation problems are discussed as well as the need of further studies.

Chiroptera, distribution, Central Balkan Mts., Bulgaria

Introduction

The bat fauna of the Central Balkan Mts. in Bulgaria, especially in the high mountain areas (above 700 m), has not been studied before. There were three bat species from three localities mentioned in the literature – *Rhinolophus ferrumequinum*, *R. hipposideros*, *Barbastella barbastellus*. No additional information was found by checking the available unpublished data and museum collections.

The recent study was carried out as a part of a large project for inventarization of the fauna of the NP Central Balkan with the main goals to evaluate the species diversity, to get information about ecology and biology of the species (roost and habitat preferences) and to assess their conservation status.

The study area

The Balkan Mts. is a separate physicogeographical unit situated between the Predbalkan and Zadbalkanski Kotlovini regions as a widely open to the north and the northeast curve with dominant direction of the mountain chains from the west to the east. It is not only an orographic barrier but also a hydroclimatic border. It forms a climatic boundary between northern (the temperate continental zone) and southern Bulgaria (the Mediterranean climatic zone).

The Central Balkan region is characterised by a high, compact ridge where the highest peak of the mountains is situated (Botev 2376 m). Deep river valleys divide the slopes. The average January temperature is 0– –9 °C; the average July temperature 22–10 °C (Georgiev 1991).

The NP Central Balkan is founded in 1991 with an area of 730 km^2. It includes the central ridge and a part of the slopes within altitudes 650 m to 2376 m. There are 9 natural reserves on its territory. The limestone and silicate rocky cliffs offer suitable roosts for bats as caves, niches and crevices. The vegetation consists of mesophyte mixed hornbeam-oak forests – from 600–700 to 900–1000 m a. s. l. ; beech forests – from 900–1000 to 1500–1600 m a. s. l. – which form a continuous belt and cover large areas; coniferous forests – from 1300–1600 to 2000–2200 m – with fragmentary distribution, mostly in the upper parts of the river valleys; subalpine zone – 2000–2500 m – mostly formed by the communities of juniper and whortleberry, as well as by open grass communities; alpine zone – above 2500 m, formed by hasmophytic communities (according Velchev et al. 1982).

Material and methods

The main studies were carried out in the period from August to December, 1997. The following methods were used: visual observation; mist netting at cave entrances, over small streams, around buildings; checking of potential roosts – caves, artificial galleries, buildings, tree holes, etc. For every caught individual were determine – species, sex, age and reproductive status; morphometric measurements were taken. The localities where bats were recorded are described in Table 1. The information for every species is presented as follows: name of locality; date; if not observed by the author, the name of observer is reffered (V.B. – Dr V. Beshkov, P.B. – Dr P. Beron, R.P. – Dr R. Pandurska); T – single torpid specimens, H – hibernating, MN – mist netted, m – male, f – female, ex. – sex and age indetermined.

Results

Totally 18 bat species are recorded from 18 localities, situated between 700 m and 1700 m (Tab. 2).

Rhinolophus ferrumequinum (Schreber, 1774)

New data: cave Grazdenitza, 1. 11. 1997 (V.B., P.B.): T 1 ex.; cave Boroveschka Dupka, 29. 9. 1997: T 1f, 5 ex.; art. gallery Damla Dere, 4. 11. 1997 (V.B., P.B.): T 22 ex., 2. 12. 1997: H 15 ex.; cave Vodnata, 27. 9. 1997: T 1f; cave Mazata, 3. 11. 1997 (V.B., P.B.): T 2 ex.; art. galleries Smesite, 2. 11. 1997 (V.B., P.B.): T 2 ex.; cave Bezimenna, 29. 8. 1997 (R.P., V.B.): MN 2 ex.

Literature data: cave Han Maara, 17. 4. 1962 (Beron & Gueorguiev 1967).

Rhinolophus hipposideros (Bechstein, 1800)

New data: cave Grazdenitza, 28. 9. 1997: T 1 ex., 1. 11. 1997 (V.B., P.B.): T 1 ex.; cave Boroveschka Dupka, 29. 9. 1997: T 1 ex.; art. gallery Damla Dere, 4. 11. 1997 (V.B., P.B.): T 34 ex., 2. 12. 1997: H 46 ex.; cave Zlatnata, 27. 9. 1997: T 1 ex.; cave Mazata, 25. 9. 1997: T 1m, 3. 11. 1997 (V.B., P.B.): T 8 ex.; art. gallery Haiduschka Pesen Hut, 2. 11. 1997 (V.B., P.B.): T

Map 1. Central Balkan Mts. The study area with indication of the localities where bats were recorded (¬).

Table 1. List of the localities where bats were recorded

No.	Name	Description	Altitude m a. s. l.	Vegetation type
1	Murgasch Hut, v. Buchovo	tourist hut – building with wood boarding	1400	beech forest
2	cave Grazdenitza, v. Divtchovoto	small horizontal limestone cave, source	800	beech forest
3	cave Boroveschka Dupka, v. Divtchovoto	horizontal limestone cave	950	beech forest
4	artificial gallery site Damla Dere, v. Hristo Danovo	old molybdenum mine, length of about 120 m	780	beech forest
5	caves Vodnata and Zlatnata, site Juren Ere, v. Hristo Danovo	cave Vodnata – horizontal water cave, cave Zlatnata – small horizontal cave	800	beech forest
6	cave Mazata, v. Karnare	horizontal limestone cave	1350	beech forest
7	artificial gallery, near Haiduschka Pesen Hut, v. Tchiflika	artificial gallery	750	beech forest
8	Haiduschka Pesen Hut, v. Tchiflika	tourist hut – building with wood boarding	800	beech forest
9	artificial galleries site Smesite, v. Tcherni Osam	artificial galleries	600–700	mixed deciduous forest
10	river Kumanitza Steneto Reserve, v. Tcherni Osam		800	beech forest
11	cave Raitchova Dupka Steneto Reserve, v. Tcherni Osam	large limestone cave	1400	subalpine zone
12	Pleven Hut, v. Vidima	tourist hut – mountain building with wood boarding	1500	beech forest grass meadows
13	cave Vodnite Dupki Severen Dzendem reserve, v. Vidima	water limestone cave	1400	beech forest
14	cave Han Maara near Rai Hut, v. Kalofer	limestone cave	1600	subalpine zone, timber line
15	cave Rogatchevata near Rai Hut, v. Kalofer	cave in silicate rocks	1700	alpine zone
16	small caves near river Taza, v. Taza	small limestone cave and niches	1200	coniferous forest
17	cave Bezimenna near river Taza, v. Taza	small limestone cave	1100	beech forest
18	cave Maglivijat Snjag, v. Tvarditza	large vertical limestone cave	1100	beech forest

Tab. 2. List of the bat species recorded on the territory of the Central Balkan Mts., Bulgaria

Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
R. ferrumequinum		+	+	+	+	+			+								+	
R. hipposideros		+	+	+	+	+	+		+									+
M. myotis						+					+		+	+				+
M. blythii																+		
M. myotis / blythii						+	+											
M. bechsteinii		+				+						+						
M. emarginatus						+							+	+				
M. mystacinus						+	+						+		+	+		
M. brandtii	+					+						+						
M. daubentonii			+										+			+		
P. austriacus	+												+					
P. auritus						+									+	+	+	+
B. barbastellus							+						+			+		
V. murinus												+				+		
P. pipistrellus								+				+						
H. savii						+								+	+	+		
N. noctula																+		
N. leisleri										+		+						
M. schreibersii													+					

1 ex.; art. galleries Smesite, 2. 11. 1997 (V.B., P.B.): T 17 ex.; cave Maglivijat Snjag, 26. 9. 1996: MN 2 ex.

Literature data: cave Borova dupka 2, v. Tcherni Osam (Beron 1972).

The greater and the lesser horseshoe bats use frequently the underground shelters in the region – natural caves and artificial galleries – as transient roosts and hibernacula. The old molybdenum mine near v. Hristo Danovo is an important hibernaculum for both the species.

Myotis myotis (Borkhausen, 1797)

New data: cave Mazata, 25. 9. 1997: T 1f, MN 2m, 3. 11. 1997 (V.B., P.B.): T 4 ex.; cave Raitchova Dupka, 12. 8. 1997: A 1ex., subf. 1ex.; cave Vodnite Dupki, 15. 8. 1997: MN 8m, 5f; cave Han Maara, 17. 8. 1997: MN 1m; cave Maglivijat Snjag, 26. 9. 1996: MN 6 ex.

Myotis blythii (Tomes, 1857)

New data: small caves (16.), 29. 8. 1997 (R.P., V.B.): MN 1 ex.

Myotis myotis / blythii

New data: cave Mazata, 3. 11. 1997 (V.B., P.B.): T 3 ex.; art. gallery Haiduschka Pesen Hut, 2. 11. 1997 (V.B., P.B.): T 8 ex.

Myotis bechsteinii (Kuhl, 1817)

New data: cave Grazdenitza, 28. 9. 1997: MN 1m; cave Mazata, 25. 9. 1997: MN 1m; cave Vodnite Dupki, 15. 8. 1997: MN 9m.

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

New data: cave Vodnite Dupki, 15. 8. 1997: MN 1m, 1f; cave Han Maara, 17. 8. 1997: MN 2m; cave Mazata, 3. 11. 1997 (V.B., P.B.): T 1f ad.

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

New data: cave Mazata, 3. 11. 1997 (V.B., P.B.): T 1m; art. gallery Haiduschka Pesen Hut, 2. 11. 1997 (V.B., P.B.): T 1m; cave Vodnite Dupki, 15. 8. 1997: MN 6m, 1f juv.; cave Rogatchevata, 17. 8. 1997: MN 1m juv.; small caves (16.), 29. 8. 1997 (R.P., V.B.): MN 2 ex.

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

New data: Murgasch Hut, 3. 8. 1994, MN 1m juv., 1f juv., breeding colony ca. 20 ex.; cave Mazata, 25. 9. 1997: T 1m, 3. 11. 1997 (V.B., P.B.): 1f; cave Vodnite Dupki, 15. 8. 1997: MN 3m.

The colony in Murgash Hut is the first and the only known record documenting breeding of the species in Bulgaria.

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

New data: cave Boroveschka Dupka, 29. 9. 1997: T 1f ad.; cave Vodnite Dupki, 15. 8. 1997: MN 2m ad.; small caves (16.), 29. 8. 1997 (R.P., V.B.): MN 1 ex.

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

New data: Murgasch Hut, 3. 8. 1994, MN 1f ad.; cave Vodnite Dupki, 15. 8. 1997: MN 1m ad., 1f ad.

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

New data: cave Mazata, 25. 9. 1997: MN 1m ad.; cave Rogatchevata, 18. 8. 1997: MN 1m ad., small caves (16.), 29. 8. 1997 (R.P., V.B.): MN 9 ex.; cave Bezimenna, 29. 8. 1997 (R.P., V.B.): MN 3 ex., cave Maglivijat Snjag, 26. 9. 1996: MN 7m ad, 1f ad.

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

New data: art. gallery Haiduschka Pesen Hut, 2. 11. 1997 (V.B., P.B.): T 4m ad.; cave Vodnite Dupki, 15. 8. 1997: MN 3m ad.; small caves (16.), 29. 8. 1997 (R.P., V.B.): MN 1 ex.

Literature data: river Kumanitza (Beskov & Beron 1962).

***Vespertilio murinus* Linnaeus, 1758**

New data: Pleven Hut, 14.08.1997: MN 2m ad., breeding colony ca. 15; small caves (16.), 29. 8. 1997 (R.P., V.B.): MN 1 ex.

The breeding colony in Pleven Hut is the first and only known record proving the breeding of the species in Bulgaria.

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

New data: Haiduschka Pesen Hut, 9. 8. 1997: MN 1m ad.; Pleven Hut, 14. 8. 1997: MN 1 ex.

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

New data: cave Mazata, 25.09.1997: MN 1m ad.; cave Han Maara, 17. 8. 1997: MN 1m ad.; cave Rogatchevata, 18. 8. 1997: MN 2m ad., 2f ad.; small caves (16.), 29. 8. 1997 (R.P., V.B.): MN 3 ex.

One of the bat species rare observed above the timber line (together with *P. auritus*).

***Nyctalus noctula* (Schreber, 1774)**
New data: small caves (16.), 29. 8. 1997 (R.P., V.B.): MN 2 ex.

***Nyctalus leisleri* (Kuhl, 1817)**
New data: river Kumanitza, 10. 8. 1997: MN 1m ad.; Pleven Hut, 14. 8. 1997: MN 1f ad.

***Miniopterus schreibersii* (Kuhl, 1817)**
New data: cave Vodnite Dupki, 15. 8. 1997: MN 3m ad., 3m juv., 1f ad.

The cave Vodnite Dupki is a transient migratory roost (and possibly a breeding roost) of a small *Miniopterus*' colony and it is the highest known record of this species in Bulgaria (1400 m a. s. l.).

Conservation problems

On the territory under study the human impact is highly limited, as the region is difficult of access on the one side and on the other – large territories are declared as strictly protected areas. Potential threats represents cutting of old forests (which is still illegally done in some areas) and disturbance of bats in the buildings (mostly because of the lack of ecological education).

The bat fauna of the highest Bulgarian mountains, including the Balkan Mts., Pirin, Rila, etc. is still poorly known. More intensive research on all the tree-dwelling bat species is required regarding the study of their diversity, distribution of summer and winter roosts, feeding habitats, migration routes, etc. The increase in the number of data on the biology and ecology of bats is very important for establishing and implementation of real and adequate protective and conservation measures, which in the case of the Central Balkan Mts. demands a development of proper management plans for the protected areas and woodlands.

Súhrn

Prvé poznatky o netopieroch pohoria Stredný Balkán v Bulharsku. Príspevok poskytuje nové údaje o výskyte a ekológii netopierov vyskytujúcich sa v pohorí Balkán (Stará Planina) v Bulharsku. Predkladané údaje sa týkajú územia Národného parku "Stredný Balkán" a niektorých priľahlých oblastí a sú výsledkom prvého prieskumu netopierov v oblasti, ktorý sa uskutočnil v období august – december 1995–1997 použitím odchytov netopierov do sietí a kontrolou potenciálnych úkrytov (jaskyne, štôlne, budovy atď.). Nálezy troch druhov netopierov (*Rhinolophus ferrumequinum*, *R. hipposideros*, *Barbastella barbastellus*) boli zo študovanej oblasti uvádzané už v minulosti. Súčasným výskumom bol výskyt týchto troch druhov potvrdený. Ďalších 15 druhov bolo zistených v tejto oblasti po prvýkrát. Celkom sa v práci uvádza 18 druhov netopierov z 18 lokalít situovaných v nadmorskej výške 700 m až 1700 m n. m.: *Rhinolophus ferrumequinum*, *R. hipposideros*, *Myotis myotis*, *M. blythii*, *M. mystacinus*, *M. brandtii*, *M. daubentonii*, *M. emarginatus*, *M. bechsteinii*, *Barbastella barbastellus*, *Plecotus auritus*, *P. austriacus*, *Pipistrellus pipistrellus*, *Hypsugo savii*, *Vespertilio murius*, *Nyctalus leisleri*, *N. noctula*, *Miniopterus schreibersii*. V práci sa uvádzajú aj krátke

poznámky o úkrytoch a preferencii biotopov jednotlivých druhov netopierov. Na záver sú diskutované problémy ochrany ako aj potreba ďalšieho výskumu v oblasti.

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