
BATS (MAMMALIA: CHIROPTERA) OF THE OSOGOVSKA PLANINA MOUNTAIN-RESULTS FROM A SURVEY CARRIED IN 2008

A. Hubancheva

Bat Research and Conservation Center- National Museum of Natural History Sofia, Sofia, Bulgaria

Correspondence to: Antonia Hubancheva

E-mail: antilor@abv.bg

ABSTRACT

A study on the bat fauna in the Bulgarian part of Osogovska Planina Mountain was carried out in the period May to October 2008. Bats were captured by mist-nets or observed in known and potential roosts such as caves, artificial galleries and buildings. The existing literature data was reviewed. Altogether 21 species (64% of the bat fauna in Bulgaria) were recorded from 15 localities during the study period: *Rhinolophus ferrumequinum*, *Rhinolophus hipposideros*, *Rhinolophus euryale*, *Myotis myotis*, *Myotis blythii*, *Myotis bechsteinii*, *Myotis emarginatus*, *Myotis nattereri*, *Myotis mystacinus*, *Myotis aurascens*, *Myotis brandtii*, *Myotis alcathoe*, *Plecotus auritus*, *Nyctalus noctula*, *Nyctalus leisleri*, *Pipistrellus kuhlii*, *Hypsugo savii*, *Eptesicus serotinus*, *Vespertilio murinus*, *Barbastella barbastellus*, *Miniopterus schreibersii*. 13 species were found for the first time in Osogovska Planina Mt. With regard to roosting and hunting preferences of bats, 10 species belong to the forest-dwelling group, 7 species are typical cave-dwellers and the occurrence of 4 species is associated with the presence of rocks or human settlements. Clear-cuts in the beech forests are the major threat to occurrence and population density of bats in the mountain.

Keywords: Chiroptera, species composition, distribution, Osogovska Planina Mountain

Introduction

Bulgarian part of Osogovska Planina Mountain is the northernmost mountain of the Osogovsko-Belasishka mountain range (2 895 km²). The highest summit reaches 2251m (Ruen Summit). Being a border region, the mammal fauna is not well researched compared to other Bulgarian mountain regions. This is especially true for the the bat fauna, which is the least studied group and thus only limited records of bats were known from the literature (1, 2, 3, 8). The present ongoing research aims to raise the knowledge of the species composition, seasonal occurrence and distribution of bats in the Bulgarian part of Osogovska Planina Mountain.

Materials and methods

The field research was carried from May to October 2008 during 23 days and 17 nights. Bats were mostly captured with mist nets (16mm mesh size) with length of 3m, 6m, 7m, 10m and 12m. The nets were set up in forest cuttings, above rivers and at the entrance of mine galleries and caves. All body measurements were taken with plastic caliper. Identification

of species and the systematic arrangement follows the field-guide of Dietz and von Helversen (4). All bats were released on the place of their capture, immediately after their identification. Caves and mine galleries were explored during the day for accessing potential bat roosts and resting places. Caves with known bat colonies were visited on a regular basis.

Results and Discussion

Altogether 21 species of bats (64% of the species known in Bulgaria) from 15 localities were found in the study area. 13 species were proved for the first time in the Bulgarian part of the mountain.

List of localities mentioned in the text

1. Village Chetirtsu, cave Uske; alt. 450 m
2. Kyustendil, building in the town; alt. 525m
3. Village Novo selo, near to Novoselska Reka River, alt. 825m;
4. Near Osogovo Hut, alt. 1633m;
5. Prevala area, an old bus stop building, alt. 1254m;
6. Village Sazhdenik, disused mine gallery above Sazhdenik, alt. 1448m;
7. Village Smolichino, near Eleshnitsa River; alt. 715 m.

8. *Village Stradalovo, cave Mecha (Lisicha) dupka;*
9. *Village Stradalovo, near the rocks, mahala Logodash, alt. 820m;*
10. *Village Stradalovo, Nechemska mahala, unnamed cave № 1 in Strashi Dol; alt. 745m*
11. *Village Stradalovo, Nechemska mahala, unnamed cave № 2 in Strashi Dol; alt. 725m*
12. *Studen Kladenets area, Starata pompena stantsia, alt. 1332m;*
13. *Village Vaksevo, over Rechitsa River, alt. 553m;*
14. *Village Vetren, cave Golyamata (Iliiskata) peshtera, alt. 1280m;*
15. *Village Vetren, road under Zastavata, alt. 1100m.*

Species list

The number of each locality corresponds to the list given above. Literature sources are presented in square brackets. The following abbreviations were used: **m, mm-** male, males; **f, ff-** female, females; **ind.-** individuals of unknown gender.

1. *Rhinolophus ferrumequinum* (Schreber, 1774)

Published data: Loc. 1, 10.05.1959 (3, 1), Loc. 8, 10.08.1994, nurs. colony of ca. 200 ind. (1); Loc. 14, 3.01.1999, 3 ind.(1). **Original data:** Loc. 1, 12.10.2008, 1 m, 1 f; Loc. 7, 29.07.2008, 1 m; Loc. 9, 30.05.2008, 2 ff; Loc. 11, 18.09.2008, 3 ind. (2 m); Loc. 14, 18.09.2008, 2 ind., 11.10.2008, 2 ind.

The species was found in six localities (alt. 450-1280m), with only one breeding colony (1). In all other localities (mainly caves) only single specimens were found. The species is far more common in the regions with natural caves and mine galleries.

2. *Rhinolophus hipposideros* (Bechstein, 1800)

Published data: Loc. 8, 27.02.1969 (2, 1). **Original data:** Loc. 1, 12.10.2008, 1 f; Loc. 6, 31.08.2008, 1 ind.; Loc.10, 18.09.2008, 1 m.

This species was found in five localities (alt. 450-1448m). In all underground localities only single specimens were found. The species is presumed to roost in low number in basements and ceilings of old or abandoned houses.

3. *Rhinolophus euryale* Blasius, 1853

Original data: Loc. 14, 18.09.2008, 2 mm, 11.10.2008, 50 ind.

The species was found in only one locality (alt. 1280 m). At present it is not yet known where it breeds and hibernates. We presume that there are still unknown to us natural caves in the area (or other underground roosts), which are outside the research area, for example on the territory of the Republic

of Macedonia. Since we have found the species only out of the breeding period it is possible that a small colony exists near by and small groups and solitary individuals spread over the region as it is known from the Northern Bulgaria (6). **The species is new for the mountain (1).**

4. *Myotis myotis* (Borkhausen, 1797)

Published data: Loc. 14, 8-9.06.1996, mixed colony of hundreds of bats (8, 1).

Original data: Loc.6, 31.08.2008, 2 mm.

This species was found in two localities at relatively high elevations (alt. 1280-1448m). No colony of this species was found during 4 visits in Golyamata peshtera cave (Loc. 14). At present it is early to draw any conclusions about the status, distribution and population density of the species in the area.

5. *Myotis blythii* (Tomes, 1857)

Published data: Loc. 14, 8-9.06.1996, mixed colony of hundreds of bats (8, 1).

Original data: Loc.14, 30.08.2008, 1 m.

Our data indicate that the species is rare in the region and Golyamata peshtera cave (Loc. 14) is only used as a temporary roost during its seasonal migrations.

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

Original data: Loc.14, 18.09.2008, 1 ind.

6. *Myotis bechsteinii* (Kuhl, 1817)

Original data: Loc. 9, 30.05.2008, 1 f; Loc. 14, 30.08.2008, 2 mm.

The species was found in two localities (alt. 820-1280m). Presumably the species is evenly distributed in the old broad-leaved forests of Osogovska planina Mountain. **The species is new for the area (9).**

7. *Myotis* (cf.) *brandtii* (Eversmann, 1845)

Original data: Loc. 7, 29.07.2008, 1 f.

Only a single subadult female was captured (alt. 715 m). Further research will confirm or reject the occurrence of this rare cryptic species in the studied region. **The species is new for the area (1).**

8. *Myotis mystacinus* (Kuhl, 1817)

Original data: Loc. 4, 27.06.2008, 3 ind (2 mm).

The only locality in the area is at 1633m of altitude. Osogovska Planina Mountain offers good environmental conditions for the species (1) and probably the species is widespread and abundant in the forested regions. **The species is new for the area (1).**

9. *Myotis aurascens* Kuzjakin, 1935

Original data: Loc 3, 27.07.2008, 1 m.

The only locality in the area is at 825 m of altitude. The mountain offers optimal conditions for the species and probably the species is common in the forested regions. There are many difficulties with the identification of this species in the field (4, 5) and thus all juvenile, subadult and female individuals from this group of closely related species were carefully examined. **The species is new for the area (1).**

10. *Myotis alcaethoe* Helversen & Heller, 2001

Original data: Loc 3, 27.07.2008, 1 m.

Although only a single male was captured (Loc. 3, alt. 825 m), the study area offers plenty of suitable habitats and the species is probably not so rare. **The species is new for the area (10).**

Whiskered bats group (= *M. alcaethoe*, *M. mystacinus*, *M. aurascens*, *M. brandtii*)

Original data: Loc. 13, 11.10.2008, 1 m., 2 ff; Loc. 15, 28.05.2008, 2 ff.

The identification of living whiskered bats in field conditions, especially of young and subadult individuals and females, is difficult (4). Thus the species status of these individuals remained unclear.

11. *Myotis emarginatus* (Geoffroy, 1806)

Original data: Loc. 6, 31.08.2008, 1 m.

This new locality (at 1448 m) is amongst the highest in western Bulgaria (1). It is possible that most of the galleries in the area above village of Sazhdenik are important swarming sites. However further field records will reveal the importance of this complex. **The species is new for the area (1).**

12. *Myotis nattereri* (Kuhl, 1817)

Published data: Loc. 14, 8-9.06.1996, 1 ind. (8, 1).

Original data: Loc. 6, 16.09.2008, 1 m; Loc. 12, 29.06.2008, 1 m.

The species was captured in 3 localities (1280-1448 m). We presume that it is much more common and abundant in the studied area.

13. *Nyctalus noctula* (Schreber, 1774)

Original data: Loc. 3, 27.07.2008, 3 mm.

The only location in the area is at altitude of 825 m. The presence of spacious oak and beech forests in the mountain prompt for higher population density, which is difficult to

estimate without complex assessments including ultrasonic bat detectors, mist-nets and visual counts. **The species is new for the area (1).**

14. *Nyctalus leisleri* (Kuhl, 1817)

Original data: Loc. 3, 27.07.2008, 6 mm; Loc. 15, 28.05.2008, 1 m.

The species was found in two localities (alt. 825-1100m). The Leisler's bat is a strict forest dwelling species, which distribution and density in the region needs further field research. **The species is new for the area (1).**

15. *Pipistellus kuhlii* (Kuhl, 1817)

Published data: Loc. 2, 10.08.1997, nursery colony (4 mm, 2 ff) (1); 10.10.2001, colony, 2 mm (1).

The species is synantropic and at present is known only from the city of Kyustendil.

16. *Plecotus auritus* (Linnaeus, 1758)

Original data: Loc. 6, 31.08.2008, 4 mm, 2 ff; 16.09.2008, 2 mm, 4 ff; Loc. 12, 29.06.2008, 1 m; Loc. 13, 29.05.2008, 1 f (identified as *Plecotus* sp.).

The species might be considered as common in the study area (3 localities, 550-1448m). The individuals captured in the mine gallery (Loc. 6) above village of Sazhdenik were larger compared to those pointed in (4). Further accumulation of field records will reveal the range of morphometric and meristic variability within the *Plecotus* individuals found at the higher altitudes in Osogovo Mt. **The species is new for the area (1).**

17. *Vespertilio murinus* Linnaeus, 1758

Original data: Loc. 5, 28.07.2008, 1 ind.

The species is common in the high mountains of Bulgaria during the summer and its discovery at altitude of 1254m was not surprising. **The species is new for the area (1).**

18. *Barbastella barbastellus* (Schreber, 1774)

Original data: Loc. 3, 27.07.2008, 1 f.

The Barbastelle bat is a forest dwelling species and discovery of a lactating female above Novoselska Reka River (825 m) prompt that it breeds in the region. **The species is new for the area (1).**

19. *Eptesicus serotinus* (Schreber, 1774)

Original data: Loc. 12, 29.06.2008, 1 m.

In the area of Studen Kladenets (alt. 1332 m) we caught only one male, which was roosting in a building. **The species is new for the area (1).**

20. *Hypsugo savii* (Bonaparte, 1837)

Published data: Loc. 2, 10.10.2001, 1 m (1); Loc. 14, 8-9.06.1996, 1 ind. (8, 1).

Original data: Loc. 5, 01.09.2008, 1 m; Loc. 12, 29.06.2008, 1 m.

The Savi's pipistrelle primary roosts in rock crevices and in human buildings. Although the roost availability is limited in the study region, the species was found in 4 localities (alt. 525–1332 m).

21. *Miniopterus schreibersii* (Kuhl, 1817)

Published data: unknown locality in the mountain, 11.02.1935, 1 m (1); Loc. 14, 8-9.06.1996, mixed colony of hundreds of bats (8, 1). **Original data:** Loc. 14, 29.05.2008, 400 ind.; 30.08.2008, 1000 ind.; 18.09.2008, 350 ind., 11.10.2008, 500 ind.

The most important roost for the Schreiber's Bat is Golyamata Peshtera cave (Loc. 14). A small colony of 400-500 ind. was found to roost in the cave during the summer but the available field data do not indicate that this is a maternity colony. Considering the presence of other species (e.g. *Myotis myotis*, *M. blythii* and other) during the swarming season the cave was proved to be an Important Bat Underground Habitat (11).

Conclusions

Considering that the study region is mostly covered with deciduous forests it was not surprising to find that 48% of the species belong to the forest-dwelling bat group (*Myotis bechsteinii*, *Myotis brandtii*, *Myotis aurascens*, *Myotis alcaho*, *Myotis mystacinus*, *Myotis nattereri*, *Barbastella barbastellus*, *Nyctalus noctula*, *Nyctalus leisleri* and *Plecotus auritus*). Seven species, 33% (*Rhinolophus ferrumequinum*, *Rhinolophus hipposideros*, *Rhinolophus euryale*, *Myotis myotis*, *Myotis blythii*, *Myotis emarginatus* and *Miniopterus schreibersii*) are typical cave-dwellers. The occurrence of *Pipistrellus kuhlii*, *Vespertilio murinus*, *Eptesicus serotinus* and *Hypsugo savii* is primarily associated with presence of human settlements, buildings and rock crevices. Intensive logging in the beech forests (especially above the village of Sazhdenik) are the major threat to occurrence and population density of the forest-dwelling bats in the mountain. Further research will probably raise the number of species, which occur in the study region by adding some species known to occur nearby (e.g. *Pipistrellus pygmaeus*, *Pipistrellus pipistrellus*, *Myotis daubentonii* and other).

Acknowledgment

I would like to thank Vladimir Petrov, Zornitsa Zaharieva and Georgi Toshev (University of Sofia, Faculty of Biology), Diana Zlatanova and Venislava Racheva (Zoo Sofia), Dr. Stoyan Beshkov (NMNH-BAS, Sofia) and Violeta Zhelyazkova for their help during the field works. The help of Boyan P. Petrov (NMNH-BAS, Sofia) for planning this study and improving the earlier drafts of this paper is also acknowledged. All field works in 2008 were funded by the project "Balkan Green Belt in Osogovo Mountains" carried by the Bulgarian Biodiversity Foundation.

REFERENCES

1. Benda P., T. Ivanova, I. Horacek, V. Hanak, J. Cervený, J. Gaisler, A. Gueorguieva, B. Petrov, V. Vohralik (2003) Acta Soc. Zool. Bohem., **67**, 245-357
2. Beron P. (1973) Bull. Inst. Zool. Mus., Sofia, **37**, 167–199.
3. Guéorguiev V., Beron P. (1962) Ann. de Spéléologie; **17** (2-3), 285-441.
4. Dietz Ch., Helversen O. von (2004) Illustrated Identification Key to the Bats of Europe. - Electronic Publication, Version 1.0. released 15.12.2004, Tuebingen & Erlangen, Germany, http://www.uni-tuebingen.de/tierphys/kontakt/mitarbeiter_seiten/, 72 pp.
5. Dietz Ch., Helversen O. von, Nill D. (2007) Handbuch der Fledermäuse Europas und Nordwestafrikas. Kosmos, Stuttgart, p. 399
6. Dietz Ch., Dietz I., Ivanova T., Siemers B.M. (In press). Movements of horseshoe bats (*Rhinolophus*, Chiroptera: Rhinolophidae) in northern Bulgaria. *Myotis*, Bonn.
7. Ivanova T. (2005) Acta Zoologica Bulgarica, **57** (2), 197-206.
8. Pandurska R.S., Beshkov V. (1998) Bats (Chiroptera) of high mountains of southern Bulgaria. Pp.: 135-140. In Carbonel. J.-P. & Stamenov I.N. (eds.): Observatoire de montagne Moussala. Symposium international, October 1997, Borovetz. Sofia.
9. Petrov B. (2006) Praha, **37**, 179-195.
10. Niermann I., Biedermann M., Bogdanowicz W., Brinkmann R., Bris Y. Le, Ciechanowski M., Dietz Ch., Dietz I., Estók P., Helversen O. von, Houédec A.Le, Paksuz S., Petrov B.P., Özkan B., Piksa K., Rachwald A., Roue S.Y., Sachanowicz K., Schorcht

-
- W., Tereba A., Mayer Fr.** (2007) *Acta Chiropterologica*, **9 (2)**, 361–378.
- 11. Ivanova T.** (2005) *Acta Zoologica Bulgarica*, **57 (2)**, 197-206.