PRELIMINARY ASPECTS ABOUT THE SPECIFIC COMPOSITION OF THE BATS FAUNA FROM THREE CAVES OF DOBROGEA

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Abstract. There were investigated 3 caves from Dobrogea, Constanţa County: Peştera Limanu, Peştera Liliecilor de la Gura Dobrogei and Peştera Casian. The study has tracked the changes in the specific composition of bats during a summer (June - September) on the summer colonies from the mentioned caves; also this includes some dates from hibernation period.

Keywords: cave, fauna, Chiroptera, mist-nets, Dobrogea.

Rezumat. Aspecte preliminare privind compoziţia specifică a coloniilor de chiroptere din trei peşteri din Dobrogea. Au fost investigate 3 peşteri din Dobrogea, jud. Constanţa: Peştera Limanu, Peştera Liliecilor de la Gura Dobrogei şi Peştera Casian. Studiul a urmărit schimbările în compoziţia specifică a chiropterelor pe parcursul unei veri (iunie-septembrie) în cadrul coloniilor de vară din peşterile menţionate; totodată au fost incluse şi unele date din perioada de hibernare.

Cuvinte cheie: peşteră, faună, Chiroptera, plasă chiropterologică, Dobrogea.

Introduction

In Dobrogea, there are few researches about bats fauna, those being mainly focused on two underground shelters: Peştera Liliecilor de la Gura Dobrogei and Peştera Limanu (Dumitrescu *et al.*, 1963, 1965; Valenciuc & Ion, 1971a; Cerveny, 1982). First record from Dobrogea appears at the beginning of 20th century, when Földváry (1906) describes a new species, *Rhinolophus mehelyi*, based on two specimens collected by A.L. Montandon from Peştera Limanu (Constanţa County) (Barti, 2005).

Because changes interfered as well in the specific composition as in the numbers of different species of bats, an actual study was necessary. There were considered the previous dates to which the personal dates were added to outline a better image about bats communities from studied caves.

In Peştera Limanu were identified 2 species of bats: *Myotis daubentonii* and *Rhinolophus mehelyi*. In Peştera Liliecilor de la Gura Dobrogei were observed 8 species of bats: *Rhinolophus ferrumequinum, Myotis blythii, Myotis daubentonii, Myotis mystacinus bulgaricus?, Eptesicus serotinus, Miniopterus schreibersii, Plecotus austriacus* and *Plecotus auritus*. At Peştera Casian were identified 5 species of bats: *Myotis blythii, Myotis daubentonii, Eptesicus serotinus, Vespertilio murinus* and *Rhinolophus ferrumequinum*.

Material and Methods

Three caves were investigated from Constanţa County: Peştera Liliecilor de la Gura Dobrogei, which can be found on the Visterna riverside, which has a length of 480 m; Peştera Casian (near Casian Monastery), which is on Casimcea riverside, both caves

can be found at about 5km from Târguşor village and Peştera Limanu, situated at 500m west of Limanu village, this is the longest cave from Dobrogea – 3.2 km.

Four visits were made: 26-28.06.2006, 30.07-1.08.2006, 27-29.08.2006 and 14.12.2006. The bats were observed in shelter in daytime and numbered, captured with the mist-nets in nocturnal time, but also identified using the time expansion detector at the exit of the caves. Mist-nets were placed between 20.00 – 1.00 hours, for 9 nights. There were captured 177 bats in 28 hours. The mist-net was placed in June, July and August, for studying the changes in the specific composition of the bats colonies but also for studying the types of the colonies from the studied caves.

The species were determined by using the identification keys (Grimmberger & Schober, 1996; Valenciuc, 2002; Murariu *et al.*, 2003; Dietz & Helversen, 2004) and after the morphometrical measures. The tools used: sliding calipers, magnifying glass (x10), digital photo camera, weighing machine, 3, 7, 10 m mist-nets.

Results and Discussion

Identified bats species

1. *Rhinolophus ferrumequinum* (Schreber, 1774)

Collected data material by the authors: Peştera Liliecilor de la Gura Dobrogei, 27.06.2006, 31.07.2006, 28.08.2006, summer and mating shelter (4 adults netted: 2♂ + 2♀); 14.12.2006, hibernation shelter (20 specimens). Peştera Casian, 14.12.2006, winter shelter (2 specimens). Peştera Babei from Cheile Dobrogei, 29.08.2006, mating shelter (3 specimens).

Previous records: Peştera Liliecilor de la Gura Dobrogei, 1955-1958, summer and winter colony; 12/13.08.1968, summer colony; 31.07.1979, birth colony of 200-300 specimens (Dumitrescu *et al.*, 1963; Valenciuc & Ion, 1971a; Cerveny, 1982). Peştera Limanu, 2.11.1958, a colony; 21.07.1974, 2 specimens observed (Dumitrescu *et al.*, 1963; Cerveny, 1982).

2. *Rhinolophus mehelyi* Matschie, 1901

Collected data by the authors: Peştera Limanu, 30.07.2006, summer and mating shelter (~20-50 specimens). Peştera Liliecilor de la Gura Dobrogei, the species wasn't identified.

Previous records: Peştera Liliecilor de la Gura Dobrogei, 1956-1965, the biggest birth colony from Europe, of ~5000 specimens and a winter colony; 12/13.08.1968, summer colony; 17.07.1974 birth colony of 500 specimens; 31.07.1979, a colony of 100-150 specimens (Dumitrescu *et al.*, 1963; Valenciuc & Ion, 1971a; Cerveny, 1982). Peştera Limanu, 1963, 1964, the biggest winter colony from Romania; 21.07.1974, summer colony, 24 specimens netted (Dumitrescu *et al.*, 1965; Cerveny, 1982).

3. *Myotis blythii* (Tomes, 1857)

Collected data by the authors: Peştera Liliecilor de la Gura Dobrogei, 27.06.2006, 31.07.2006, 1.08.2006, 28.08.2006, birth colony of 150-200 specimens and mating colony of 100-150 specimens (12♀ + 20♂ specimens netted); 14.12.2006, winter colony of 100 specimens. Peştera Casian, 28.06.2006, 29.08.2006, summer shelter (5♂netted) and mating shelter (1♂netted).

Previous records: Peştera Liliecilor de la Gura Dobrogei, 1955-1958, a colony; 17.07.1974, big birth colony of 4000-5000 specimens; 31.07.1979, birth colony of 150-200 specimens (Dumitrescu *et al.*, 1963; Cerveny, 1982).

Note. The twin species *Myotis myotis*, was identified only in anterior researches: Peştera Liliecilor de la Gura Dobrogei, 1955-1958, summer colony; 12/13.08.1968 few specimens (Dumitrescu *et al.*, 1963; Valenciuc & Ion, 1971a) and Peştera Limanu, 4.10.1958, a small number of specimens (Dumitrescu *et al.*, 1963).

4. *Myotis daubentonii* (Kuhl, 1819)

Collected data by the authors: Peştera Limanu, 26.06.2006, 30.07.2006, 27.08.2006, birth colony and mating colony of 100-150 specimens (43♀ + 14♂ netted). Peştera Liliecilor de la Gura Dobrogei, 1.08.2006, 28.08.2006, mating colony of ~50 specimens (7♀ + 16♂netted); 14.12.2006, 1 specimen hibernating. Peştera Casian, 29.08.2006, mating shelter (1♀ + 1♂netted). Peştera Babei from Cheile Dobrogei, 29.08.2006, mating shelter (3 specimens).

Previous records: Peştera Liliecilor de la Gura Dobrogei, 31.07.1979, a female captured (Cerveny, 1982).

5. *Myotis mystacinus bulgaricus (Myotis aurascens* Kusjakin, 1935*)?* – (Fig. 1)

Collected data by the authors: Peştera Liliecilor de la Gura Dobrogei, 27.06.2006, 28.08.2006, birth shelter (1♀ nursing netted) and mating shelter (1♀ netted).

Note. Anterior data regarding the cryptic species: *Myotis mystacinus,* Peştera Liliecilor de la Gura Dobrogei, 20.01.1956, winter colony; Peştera Limanu, 2.12.1958 (Dumitrescu *et al.*, 1963) and *Myotis brandtii*, Peştera Liliecilor from Gura Dobrogei, 7.08.1989, first recorded for the chiroptera fauna of Romania (Grimmberger, 1993).

Figure 1. (Pocora Viorel) *Myotis mystacinus bulgaricus (M. aurascens)?* – nursing female netted at Peştera Liliecilor de la Gura Dobrogei.

6. *Miniopterus schreibersii* (Kuhl, 1819)

Collected data by the authors: Peştera Liliecilor de la Gura Dobrogei, 27.06.2006, 31.07.2006, 1.08.2006, 28.08.2006, summer colony of about 50-100♂ and mating colony (13♀ + 12♂netted); 14.12.2006, 1 specimen hibernating.

Previous records: Peştera Liliecilor de la Gura Dobrogei, 1955-1958 summer and winter colony; 12/13.08.1968, summer colony; 16.07.1974, big birth colony of 2000-3000 specimens; 31.07.1979, birth colony of 100-200 specimens (Dumitrescu *et al.*, 1963; Valenciuc & Ion, 1971a; Cerveny, 1982). Peştera Limanu, 1958-1965, winter colony (Dumitrescu *et al.*, 1963, 1965).

7. *Eptesicus serotinus* Schreber, 1774

Collected data by the authors: Peştera Liliecilor de la Gura Dobrogei, 27.06.2006, 31.07.2006, 1.08.2006, 28.08.2006, summer and mating shelter (3♀ + 15♂

netted). Peştera Casian, 28.06.2006, birth and summer shelter (2♀ that were nursing – Fig. 3 + 1♂netted).

Previous records: Peştera Liliecilor de la Gura Dobrogei, 31.07.1979, 3♂ netted (Cerveny, 1982). Peştera Limanu, 21.07.1974, 1♂ netted (Cerveny 1982).

Note: It looks like this species visit the caves only in the night time. On the date of 1.08, at 23.45 an adult, partially albino/leucist male was captured at Peştera Liliecilor de la Gura Dobrogei, which presented a small white spot in the middle of its forehead (Fig. 2).

Figure 2. (Pocora Viorel) *E. serotinus* – male - partially albino/leucist netted at Peştera Liliecilor.

Figure 3. (Pocora Viorel) *E. serotinus* – nursing female netted at Peştera Casian.

8. *Vespertilio murinus* Linnaeus, 1758

Collected data by the authors: Peştera Casian, 28.06.2006, birth colony in cracks, 2 young bats of 3-4 weeks old netted (Fig. 4).

Previous records: Peştera Liliecilor de la Gura Dobrogei, 31.07.1979, 1♀ netted (Cerveny, 1982).

Figure 4. (Pocora Viorel) *Vespertilio murinus* – young netted at Peştera Casian.

9. *Plecotus austriacus* (Fischer, 1829)

Collected data by the authors: Peştera Liliecilor de la Gura Dobrogei, 27.06.2006, 1♂ netted.

Note. *Plecotus auritus,* twin species, was identified former at Peştera Liliecilor de la Gura Dobrogei, 20.01.1956, a small number of specimens (Dumitrescu *et al.*, 1963),

specimens that seems to be re-identified as *P. austriacus*. We found at the same cave, 1 specimen of *P. auritus* hibernating on the date of 14.12.2006.

The bat species found in our study are typical cave species, from those the following species seem to be dominant for the Dobrogean Karst: *Myotis daubentonii* (83 specimens netted), *Myotis blythii* (40 specimens netted), *Miniopterus schreibersii* (25 specimens netted) and *Eptesicus serotinus* (21 specimens netted). The other identified species: *Rhinolophus ferrumequinum, Rhinolophus mehelyi, Vespertilio murinus, Myotis mystacinus bulgaricus?, Plecotus austriacus* and *Plecotus auritus* are more rare in the studied area.

A concerning problem is the actual situation of the specific composition and the number of bats from the colonies in the studied shelters. *Rhinolophus mehelyi*, in ‘60s was forming a birth colony of 4000-5000 specimens at Peştera Liliecilor de la Gura Dobrogei, colony that looks like it was moving in hibernation period to Peştera Limanu (Dumitrescu *et al.*, 1965); the number of specimens from the birth colony has decreased to 500 specimens in 1974 and to 100-150 specimens in 1979 (Cerveny, 1982); in 2006 we haven’t met any specimens of this species in Peştera Liliecilor de la Gura Dobrogei. In Peştera Limanu there is still a colony of 20-50 specimens.

Rhinolophus ferrumequinum, it looks like in the ‘60s the species wasn’t represented by many specimens, but Cerveny (1982) in 1979 pointed out at Peştera Liliecilor de la Gura Dobrogei, a big birth colony of 200-300 specimens, in the summer of 2006 in this cave there were still few specimens, and in the winter there are 20 specimens.

Uncertain is the presence of the species *Myotis myotis*, pointed out by Dumitrescu *et al.* (1963) and by Valenciuc & Ion (1971a) at Peştera Liliecilor de la Gura Dobrogei and Peştera Limanu. Neither we, nor Cerveny (1982) have found any specimens belonging to this species at Peştera Liliecilor de la Gura Dobrogei. It is possible that anterior the species was not identified correctly, how Cerveny specifies. On the winter of 2005, at Peştera Limanu, Anca Dragu from the Speologie Institute “Emil Racoviţă”, Bucureşti, found a skeleton of *Myotis myotis*.

Differences along the years were met at *Myotis blythii* as well, Dumitrescu *et al.* (1963) signals the presence of a colony at Peştera Liliecilor de la Gura Dobrogei and Cerveny (1982), in 1974, finds a birth colony of 4000-5000 specimens, colony which drops down to 150-200 individuals in 1979, number that has kept in 2006**.** At Museum of Natural History from Iaşi there are one specimen of *Myotis blythii*, one specimen of *Rhinolophus ferumequinum* and 65 specimens of *Miniopterus schreibersii* collected on the summer of 1990 at Peştera Liliecilor de la Gura Dobrogei.

Miniopterus schreibersii, Dumitrescu *et al.* (1963) and Valenciuc & Ion (1971a), didn’t specify the number of specimens belonging to this species, but Cerveny (1982), pointed out in 1974 a big birth colony of 2000-3000 specimens, colony that drops down in 1979 to 100-200 specimens. In 2006 the birth colony is not present anymore. There were 50-100 specimens left, which formed a summer and mating colony.

Myotis aurascens species is controversial, because the morphological differences can hardly be observed, compared to the cryptic species *M. mystacinus*. Besides, there are no genetic differences between those species. Because of this there appears the problem if it can be declared species or only subspecies of M. *mystacinus*, being probably different by *M. aurascens* from Caucaz. Another possible name could be *M. mystacinus bulgaricus*. (Dietz & Helversen, 2004). The length of the forearm, at captured individuals, was of 35.5 mm, respectively 33.3mm and the weight of 8g, respectively 6g.

The individuals belonging to *M. aurascens* have brighter colors then *M. mystacinus*, the ears are brown, their interior, the base and the tragus are light brown, sometimes pink, at *M. mystacinus* the ears are black. The adults don’t present yellow fur

at the neck area like *M. mystacinus* do. The wings margin, between V finger and foot, usually presents a thin white strip. The second premolar (P3) is very small, hardly visible (1/4, 1/3 of the first premolar size).

Unlike the previous studies we haven't identify at the investigated caves the next species: *Rhinolophus hipposideros* (Dumitrescu *et al*., 1965; Cerveny, 1982) and *Myotis nattereri* (Dumitrescu *et al.*, 1963; Cerveny, 1982).

Conclusions

In total, there were 10 species of bats identified: *Rhinolophus ferrumequinum, Rhinolophus mehelyi, Myotis blythii, Myotis daubentonii, Myotis mystacinus bulgaricus?, Miniopterus schreibersii, Eptesicus serotinus, Vespertilio murinus, Plecotus austriacus* and *Plecotus auritus*.

Myotis daubentonii is a new species for the chiroptera fauna of Peştera Limanu, where it forms birth and mating colonies.

Peştera Casian and Peştera Babei were investigated for the first time, in what it concerns the bats fauna.

A concerning problem is the actual situation of the specific composition and the number of bats from the colonies in the studied shelters.

Among the identified species from investigated caves in Dobrogea, 4 species are present in annex II of Habitats Directive: *Rhinolophus ferrumequinum, Rhinolophus mehelyi, Myotis blythii* and *Miniopterus schreibersii*.

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