

## New and significant records of *Myotis capaccinii* (Chiroptera: Vespertilionidae) from Turkey, with some data on its biology

Nové a významné nálezy netopýra dlouhonohého (*Myotis capaccinii*) (Chiroptera: Vespertilionidae) v Turecku, s několika údaji o jeho biologii

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received 6. 5. 2003

**Abstract.** The new distributional data on *Myotis capaccinii* from Turkey are presented including three records in the central and eastern parts of the country, which extend the known distribution range of the species in the Middle East significantly. Some other data on biology and morphology of the species are given.

### INTRODUCTION

The long-fingered bat, *Myotis capaccinii* (Bonaparte, 1837), is a Mediterranean bat species, distributed in southern Europe from eastern Spain to Greece, in north-western Africa and in the Middle East (GUILLÉN 1999, SPITZENBERGER & HELVERSEN 2001). The Asian part of its distribution range includes the Mediterranean coast of Asia Minor and of the Levant and Palestine and the Mesopotamian valley from northern Syria up to southern slopes of the Zagros Mts. (DEBLASE 1980, HARRISON & BATES 1991, EBENAU 1996, BENDA & HORÁČEK 1998, BENDA et al. 1999).

In Turkey, *M. capaccinii* was for the first time recorded by KAHMANN & ÇAĞLAR (1960) and ÇAĞLAR (1961), who found this species at both the European and Asian shore of the Marmara Sea and in Cilicia and Hatay. So far, *Myotis capaccinii* has been observed in Thrace and at many sites along the Marmara, Aegean and Levantine coasts of western and southern Turkey, east up to Hatay (Fig. 1; KAHMANN & ÇAĞLAR 1960, ÇAĞLAR 1961, 1965, 1969, KAHMANN 1962, OSBORN 1963, HÜRKA 1972, DEBLASE & MARTIN 1973, SPITZENBERGER 1973, KOCK 1974, 1989, CRUCITI 1988, HELVERSEN 1989, ALBAYRAK 1990a, b, 1993, AKTAŞ & HASBENLİ 1994, HASBENLİ 1997, BENDA & HORÁČEK 1998, ÖZGÜL et al. 2000, ALBAYRAK & AŞAN 2002). ALBAYRAK (1990a) has summarized all records of *M. capaccinii* in Turkey and has given also some data on systematic status of the Turkish population of the species. ALBAYRAK & AŞAN (1990) described the karyotype, baculum and several other morphologic features of *M. capaccinii* from Turkey for the first time, and they concluded, similarly as in the previous study, that the Asia Minor population of the species belonged to the nominotypic subspecies, *M. capaccinii capaccinii*.

The paper aims to present additional records of *M. capaccinii* from Turkey and to provide some data on ecology of the species at the eastern margin of its distributional range.

## MATERIAL AND METHODS

During field studies of the Turkish bat fauna carried out in 1994–2002, 86 individuals of *M. capaccinii* were caught by mistnet or handnet. All the bats were weighed and measured (see Tab. 1), sex and age was identified using the criteria given by DEBLASE (1980); most of the bats (61 individuals) were released back to the wild, 25 individuals were prepared as standard museum specimens: the prepared skins, skulls and bacula have been deposited in the collection of Department of Zoology, Niğde University, Turkey (NUZD).

## RESULTS AND DISCUSSION

### Records

In total, 86 individuals (37 males, 48 females and 1 individual of indetermined sex) of *Myotis capaccinii* have been recorded at 14 sites in Turkey (Fig. 1):

1. Sarpdere village, Dupnisa cave (Demirköy Dist., Kırklareli Prov.), 345 m a. s. l., 22 Sept. 2001: 1 female. The cave is a 1977 m long known part of a subterranean river; it is a place of finding of more bat species (BENDA & HORÁČEK 1998).
2. Gökçeali (Çatalca Dist., İstanbul Prov.), 18 Sept. 2001: 1 male and 1 female. *M. capaccinii* roosted in a ca. 30 m long cave together with *Miniopterus schreibersii* and some other species. The site of previous record of this bat species (ÖZGÜL et al. 2000).
3. Yalıköy, Çilingöz (Çatalca Dist., İstanbul Prov.), 18 Sept. 2001: 1 male. The individual was found in a ca. 600 m long cave situated at the Black Sea shore. The site of previous record of this bat species (ÖZGÜL et al. 2000).
4. Yaylacık village (Çatalca Dist., İstanbul Prov.), 18 Sept. 2001: 1 female. The bat was recorded together with *Miniopterus schreibersii*, *Rhinolophus ferrumequinum* and *R. hipposideros* in a ca. 500 m long cave. The site of previous record of this bat species (ÖZGÜL et al. 2000).
5. Sofular village (Şile Dist., İstanbul Prov.), 17 Sept. 2001: 4 males and 2 females. The cave where *M. capaccinii* had been recorded more times (ALBAYRAK 1990a, 1993, HASBENLİ 1997, ÖZGÜL et al. 2000) is situated close to the Black Sea coast (ca. 25–30 m). The bats were found in small holes and crevices in the cave ceiling.
6. Gökçeören village (İzmit Dist., Kocaeli Prov.), 8 March 2000: 2 females, 17 August 2002: 1 male. Bats were found in small holes and crevices in a ceiling of a big cave composed of several galleries. The site of previous record of this bat species (ÖZGÜL et al. 2000).
7. Uzunburun village, Sinekli cave (Manisa Prov.), 7 April 1996: 1 male. The bat was captured from a large cluster of long-fingered bats hanging on a cave wall.
8. İnsuyu cave (Burdur Prov.), 10 June 2000: 1 male. The bat was caught in a show cave, ca. 800 m long; this is a site of repeated records of this species (KOCK 1974, ALBAYRAK 1990a, b, 1993, HASBENLİ 1997).
9. Çarşamba Suyu (Beyşehir Dist., Konya Prov.), 9 August 1998: 3 females. The bats were mist-netted above a stream.
10. Say village, Delikli cave (Tarsus Dist., İçel Prov.), 25 Sept. 1999: 1 male and 2 females, 16 March 2002: 18 males and 1 female, 15 Dec. 2002: 5 males and 7 females. The bats use this several hundreds metres long cave together with several other species; *M. capaccinii* was hanging in small holes and crevices in the cave ceiling. The site of previous record of this bat species (HASBENLİ 1997).
11. Kuşçu, Sariağıl cave (Kocasinan Dist., Kayseri Prov.), ca. 1200 m a. s. l., 12 July 2001: 3 males. The entrance of the small cave (ca. 20 m long) is situated very close to the Kızılırmak River. *M. capaccinii* roosted there together with *Myotis blythii*, *M. myotis* and *Miniopterus schreibersii*.

12. Demrek village, Dipsiz cave (Hassa Dist., Hatay Prov.), 27 July 1998: 1 male. The bat was found hanging in a several hundreds metres long cave, together with a large colony of *Rousettus aegyptiacus*.
13. Karataş village (Viranşehir Dist., Şanlıurfa Prov.), 24 Sept. 2002: 1 individual. The bat was observed in a small cave near the village.
14. Eleman karavanserai (Tatvan Dist., Bitlis Prov.), ca. 1650 m a. s. l., 1 Oct. 2001: 3 females, 4 July 2002: 1 male and 24 females. The bats use an old karavanserai built by Seldjuk Turks ca. 1000 years ago as a shelter; *M. capaccinii* were clustered in ca. 0.5 m deep crevices near the roof, ca. 8 m above ground. No water bodies nor streams, potential foraging habitats, are found in a close vicinity of this site, however, the Van lake is situated about 15–20 km from there.

## Distribution

Up to now, *M. capaccinii* had been recorded in western and south-western parts of Turkey only, more or less in the coastal regions with the Mediterranean climate (BENDA & HORÁČEK 1998, ALBAYRAK & AŞAN 2002). Most of our records are in accordance with this distributional pattern (Fig. 1): 11 localities are situated in western and southern Turkey (Provinces of Burdur, Hatay, İçel, İstanbul, Kırklareli, Kocaeli, Konya, and Manisa). Nevertheless, we have found the long-fingered bats also in the central (Prov. of Kayseri) and eastern (Provinces of Bitlis and Şanlıurfa) parts of Anatolia; these findings represent the first records of this species in continental parts of Turkey. The record from Turkish Mesopotamia (Prov. of Şanlıurfa) connects the known range in Asia Minor with the distribution reported from the Syrian part of the Euphrates river valley

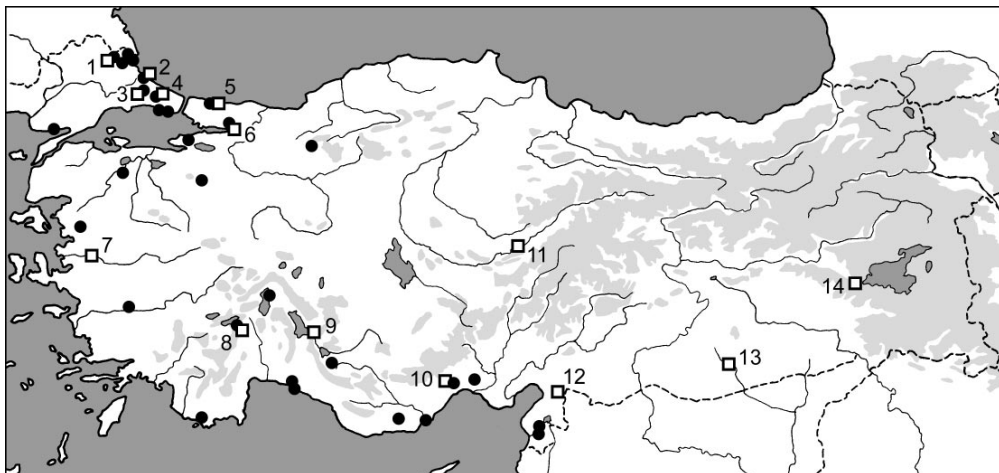


Fig. 1. Records of *Myotis capaccinii* in Turkey. Dots denote published records summarized by BENDA & HORÁČEK (1998) plus additional data by AKTAŞ & HASBENLI (1994), HASBENLI (1997), ÖZGÜL et al. (2000), and ALBAYRAK & AŞAN (2002). Open squares denote new findings, the numbers correspond with the review of records in the text.

Obr. 1. Nálezny netopýra dlouhonohého (*Myotis capaccinii*) v Turecku. Body představují nálezny shrnuté BENDOU & HORÁČEKEM (1998) doplněné dalšími údaji AKTAŠE & HASBENLIHO (1994), HASBENLIHO (1997), ÖZGÜLA et al. (2000) a ALBAYRAKA & AŞANA (2002). Prázdné čtverce představují nové nálezny, čísla odpovídají přehledu nálezny v textu ("Records").

Tab. 1. The external and cranial measurements (in milimetres) and body weight (in grams) of adult individuals of *Myotis capaccinii* from Turkey; n – number of specimens, SD – standard deviation

Tab. 1. Externí a lebeční rozměry (v milimetrech) a hmotnost (v gramech) dospělých jedinců netopýra dlohonohého (*Myotis capaccinii*) z Turecka; n – počet kusů, SD – směrodatná odchylka

measurement	rozměr	n	mean ± SD	range
total body length	délka těla	43	93.29 ± 4.92	80.0–104.0
tail length	délka ocasu	43	42.23 ± 3.44	32.0–50.0
hind foot length	délka tlapy	45	12.22 ± 0.73	11.0–14.0
ear length	délka boltce	45	14.13 ± 1.12	11.5–15.5
tragus length	délka tragu	39	7.55 ± 0.98	6.0–9.0
forearm length	délka předloktí	70	41.92 ± 1.22	38.0–43.9
tibia length	délka tibie	42	17.53 ± 0.63	16.0–18.5
length of thumb	délka palce ruky	39	7.15 ± 0.45	6.5–8.5
weight	hmotnost	25	7.32 ± 1.00	5.5–9.5
greatest length of skull	celková délka lebky	20	15.83 ± 0.29	15.50–16.30
condylobasal length	kondylobasální délka	20	14.65 ± 0.29	14.25–14.95
mandible length	délka mandibuly	20	11.61 ± 0.32	11.25–12.00
mandibular tooth row (C–M <sub>3</sub> )	délka dolní zubní řady (C–M <sub>3</sub> )	20	6.23 ± 0.10	6.05–6.30
maxillary tooth row (C–M <sup>3</sup> )	délka horní zubní řady (C–M <sup>3</sup> )	20	5.83 ± 0.11	5.70–5.95
rostrum width	šířka rostra	20	3.90 ± 0.19	3.65–4.15
interorbital constriction	meziočničová šířka	20	3.83 ± 0.09	3.75–4.00
zygomatic breadth	zygomatická šířka	20	9.45 ± 0.20	9.20–9.70
mastoid breadth	mastoidální šířka	20	8.23 ± 0.18	8.00–8.50
width of braincase	šířka mozkovny	20	7.95 ± 0.16	7.70–8.15
height of braincase	výška mozkovny	20	7.24 ± 0.13	7.05–7.35

(EBENAU 1996, WALTER & EBENAU 1997), Lower Mesopotamia (HATT 1959), and south-western Iran (DEBLASE 1980, BENDA et al. 1999). However, the findings made in the east-Anatolian highlands have enlarged the known distribution range of *M. capaccinii* in the Middle East by about 400 km to the north-east.

### Ecological remarks

The long-fingered bat is generally described as a cave-dwelling species (ÇAĞLAR 1961, ALBAYRAK 1990a, 1993, HARRISON & BATES 1991, SPITZENBERGER & HEVERSEN 2001, etc.). During the year, the individuals of *M. capaccinii* have been seen mostly hanging on the ceiling and walls of karstic caves and often also in cave crevices. We observed the long-fingered bats in a small opening of wall of the historical Eleman karavanserai on 1 October, and found a colony of lactating females and youngs at the same site on 4 July next year. Besides natural caves, the long-fingered bats often use various artificial underground spaces as roost shelters, such as mines, galleries or tunnels, but mainly out of the reach of the daylight (SPITZENBERGER & HELVERSEN 2001). We have found probably the first colony of *M. capaccinii* in an artificial shelter situated above ground, the abandoned karavanserai.

According to GUILLÉN (1999), the long-fingered bat typically clusters together with other species, mainly *Miniopterus schreibersii*, *Myotis myotis*, and *M. blythii*. In Turkey, we have found *M. capaccinii* colonies of different size, from several bats to a hundred of individuals. In

the summer period, we saw *M. capaccinii* together with *M. myotis*, *M. blythii* and sometimes also with *Miniopterus schreibersii* in the nursery colonies, forming dense mixed clusters. During hibernation period, these bat species roost together in the same caves, forming dense but not mixed clusters. In some caves, we have also observed other species such as *Rousettus aegyptiacus*, *Rhinolophus ferrumequinum*, *R. euryale* and *Barbastella barbastellus* to roost with *M. capaccinii*.

So far, the breeding biology of *M. capaccinii* has not been studied in Turkey. SPITZENBERGER & HELVERSEN (2001) mentioned the enlargement of testes in *M. capaccinii* during August, which may suggest an autumnal period of mating. Our limited observations show the gradual increase of testicle size during the whole non-hibernation period (Fig. 2); the largest size of testes was found in males caught in September and October. These data demonstrate probably the most intensive mating to happen in autumn, like in the other bat species of the temperate zone. Similar data have been reported also by HARRISON & BATES (1991) from Israel.

According to our finding of a nursery colony of ca. 300 individuals near Tatvan, females give birth by mid-June. SPITZENBERGER & HELVERSEN (2001) mentioned earlier timing of birth in the European Mediterranean population of *M. capaccinii* – mid-May. Our data suggest the influence of continental climate on the eastern-Anatolian population.

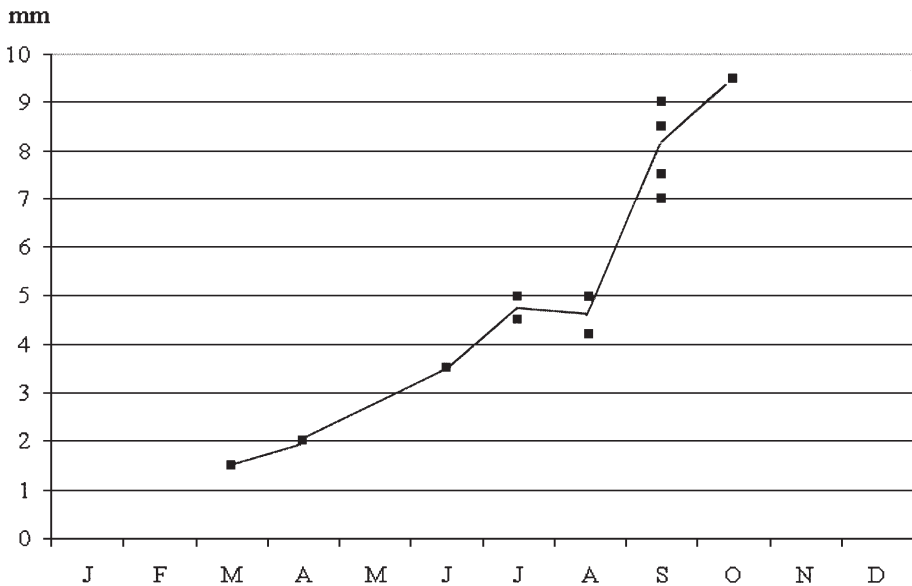


Fig. 2. Seasonal changes in testicle size in *Myotis capaccinii* sampled in Turkey (n=12).

Obr. 2. Sezonní změny ve velikosti varlat u netopýra dlouhonožého (*Myotis capaccinii*) v Turecku (n=12).

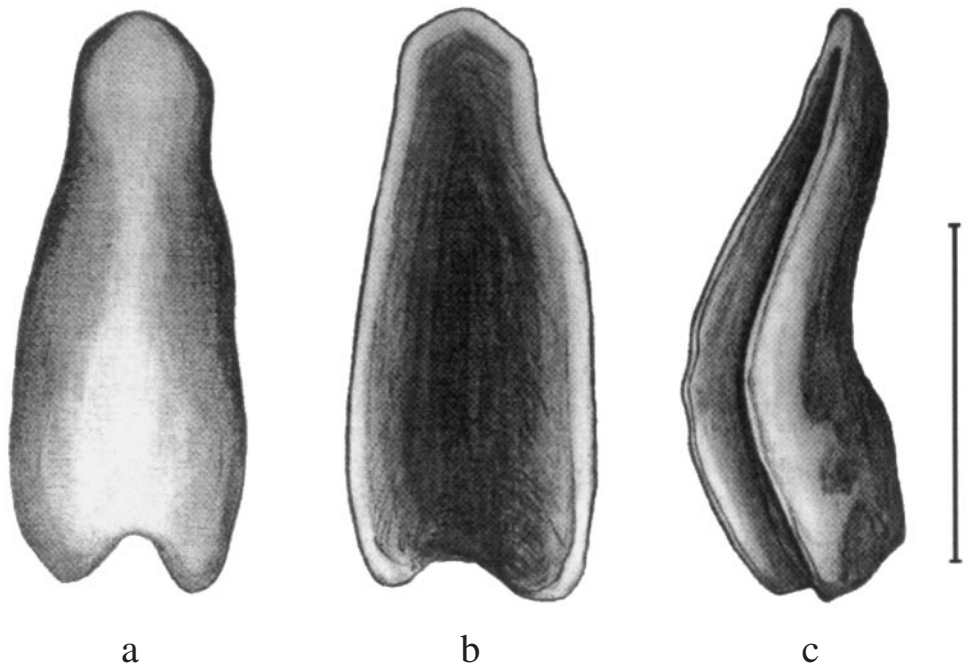


Fig. 3. Dorsal (a), ventral (b), and lateral (c) views of the baculum of *Myotis capaccinii* from Turkey. Scale – 0.5 mm.

Obr. 3. Dorsální (a), ventrální (b) a laterální (c) pohled na penisovou kost netopýra dlouhonohého (*Myotis capaccinii*) z Turecka. Měřítko – 0.5 mm.

#### Morphologic remarks

Biometric characters of our *M. capaccinii* sample are given in Tab. 1. The external and cranial measurements of the Turkish sample of *M. capaccinii* are consistent with the European and the Middle Eastern populations (MILLER 1912, ÇAĞLAR 1961, HARRISON & BATES 1991, HANÁK et al. 2001, SPITZENBERGER & HELVERSEN 2001).

The baculum is wide basally and very thin laterally (Fig. 2). The mean length of baculum is 0.90 mm (range 0.75–0.95 mm; n=5), the mean width of proximal epiphysis is 0.40 mm (0.35–0.42 mm). The metric characters of bacula of Turkish *M. capaccinii* are consistent with those given by TOPÁL (1958), VLČEK (1970) and ALBAYRAK & AŞAN (2002) for Balkan and Turkish populations.

## ACKNOWLEDGEMENTS

We wish to thank Y. KARAKAYA, F. TELLI and M. AK for their help with collecting data and material. A part of this study was supported by the Research Fund of Niğde University (Nr. 01/FEB/026) and by the Ministry of Culture of the Czech Rep. (Nr. RK 01P03OMG006 and MK0CEZ99F0201). We dedicate this study to the memory of the Late res. assist. Kuddusi ÜNSAL.

## SOUHRN

V příspěvku jsou prezentovány nové nálezy netopýra dlouhonohého (*Myotis capaccinii*) z Turecka. Nálezy ze střední a východní Anatólie významně posouvají hranici dosud známého areálu tohoto druhu na Blízkém východě. Jsou také připojeny některé údaje o morfologii a biologii druhu v Turecku.

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