

Records of European free-tailed bat *Tadarida teniotis* (Rafinesque, 1814) (Mammalia: Chiroptera) in Bulgaria

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Abstract. Seven localities of registration of European free-tailed bat *Tadarida teniotis* (Rafinesque, 1814) on the territory of Bulgaria are recorded. For the first time the species is reported in Rila Mountain. Its relatively high flying activity is registered during the late autumnal period (end of November) in Eastern Rhodopes Mountains.

Key words: European free-tailed bat, *Tadarida*, Bulgaria.

Introduction

European free-tailed bat *Tadarida teniotis* (Rafinesque, 1814) is considered one of the rarest bat species in Bulgaria. For the first time it is established in the country by Kalčev et Beshkov (1963) and for almost 30 years this is the only record of the species. During the period 1992 – 2003 the European free-tailed bat is registered in ten localities, mostly in Southern Bulgaria (Pandurska, 1992; Benda *et al.*, 2003). The species is reported in Northern Bulgaria by Pandourski et Karaivanov (2007). Until now, the European free-tailed bat is established several times in Thracian lowland, Southern Bulgaria, mainly by registration of its specific echolocation calls and direct observation of individuals (Stoycheva *et al.*, 2009).

During the last decade the use of ultrasound bat detectors revealed the larger distribution of the species in Bulgaria. It is established in wide territorial boundaries, mainly in mountain areas up to 1200 m a.s.l.

Material and Methods

Most records of the European free-tailed bat in the present paper are based on the analysis of its characteristic echolocation calls. According Papadatou *et al.* (2008) its calls cannot be confused with any other species in the region. According to these authors the peak frequency of the calls varies between 11.3 and 15.4 KHz. These low frequency narrowband echolocation calls of foraging specimens in open space at high altitude can be identified unambiguously (Rydell et Arlettaz, 1994).

The analyzed 85 recordings were made during the period of 2003 – 2012 using time expansion bat detectors: Pettersson D 240 and Tranquility Transect bat detector. The calls were recorded using “Sony VM-D6C” and “Transcend MP 860” audio recorders. The calls were analyzed using BatSound 3.1 software for Windows with time expansion (x10). The frequency components were measured from the Fast Fourier Transform (FFT) power spectrum, size 512, hanning window (Fig. 1). The following call parameters were measured: duration of separated pulses (ms), time intervals between consecutive pulses (ms), frequency with the highest energy (kHz), highest and lowest frequencies (kHz).

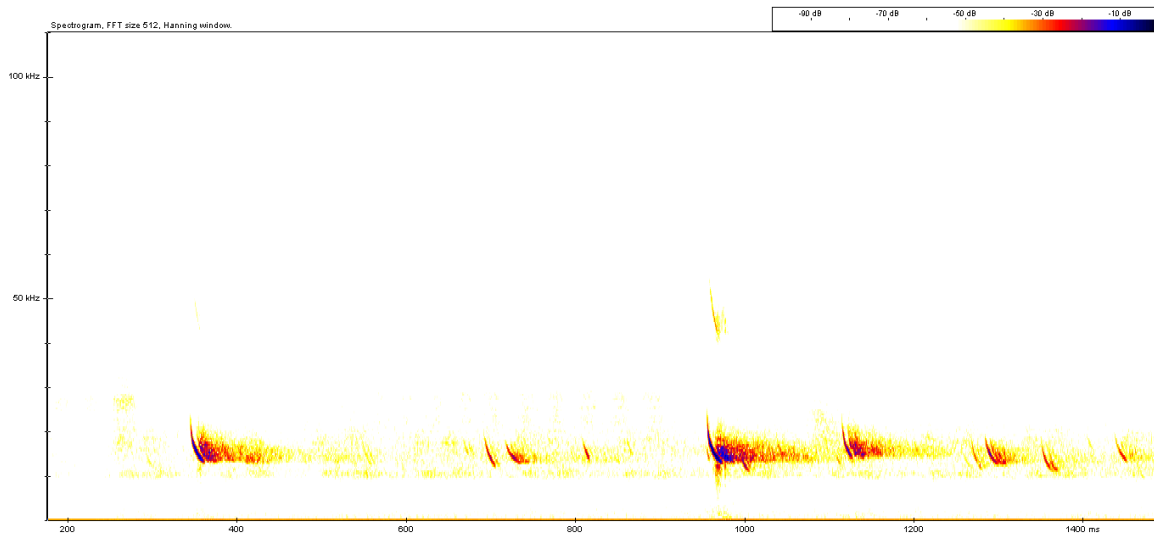


Fig. 1. Sonogram of echolocation calls of a group of emerging from the daily roost European free-tailed bats (*Tadarida teniotis*) near Madzharovo town.

Results

The European free-tailed bat (*T. teniotis*) was established by ultrasound detectors or by direct observations of individuals in seven localities (Table 1). Three of them were near Madzharovo town in the Eastern Rhodopes Mountains, where already registered small colony inhabits the crevices of a cliff (Benda *et al.*, 2003). For the first time the presence of the species is documented in the Rila Mountains at about 1200 m a.s.l. A relatively high flying activity of *Tadarida teniotis* was observed in the late autumn period in the Eastern Rhodopes Mts. at the end of November.

Table 1. Localities of European free-tailed bats (*Tadarida teniotis*).

Localities and dates	Coordinates	Altitude	Remarks
Madžarovo Town, District of Haskovo, Eastern Rhodopes Mts., 16.09.2005	N 41 38.563 E 25 53.269	142 m	Group of individuals in high flight in the valley of Arda Ruver
Madžarovo Town, District of Haskovo, Eastern Rhodopes Mts., 09.07.2005	N 41 37.368 E 25 53.217	289 m	Single specimen in high flight above small rocky valley with running water
Madžarovo Town, District of Haskovo, Eastern Rhodopes Mts., 26.11.2006	N 41 39.230 E 25 52.223	177 m	Group of individuals, emerging from daily roost in rocky cliffs
Dolna Kula village, District of Kurdjali, Eastern Rhodopes Mts., 24.11.2006	N 41 32.146 E 25 38.061	203 m	Group of individuals, emerging from daily roost in rocky cliffs
Forestry „Borovo”, District of Pazardžik, Western Rhodopes Mts., 10.08.2006	N 41 54.554 E 24 17.703	1526 m	Single specimen in high flight above forested area
Sedlovina village, District of Kurdžali, Eastern Rhodopes Mts., 31.05.2012	N 41 38.448 E 25 25.061	370 m	Single specimen in high flight
Govedartzi village, District of Sofia, Rila Mts., 26.06.2009	N 42 15.200 E 23 27.190	1193 m	Single specimen in high flight

Discussion

Till 2003 it was considered that Maritsa River valley in Southern Bulgaria represents the known northern border of distribution of *T. teniotis* in the Eastern Balkans (Benda *et al.*, 2003). The recent studies on bats in Bulgaria with use of bat detectors significantly enriched our knowledge on the status of European free-tailed bat and its larger distribution in the country.

References

- Benda, P., Ivanova, T., Horáček, I., Hanák, V., Červený J., Gaisler, J., Gueorguieva, A., Petrov, B. & Vohralík. V. (2003) Bats (Mammalia: Chiroptera) of the Eastern Mediterranean. Part 3. Review of bat distribution in Bulgaria. – *Acta Societatis Zoologicae Bohemicae*, 67: 245-357.
- Rydell, J. & Arlettaz. R. (1994) Low-frequency echolocation enables the bat *Tadarida teniotis* to feed on tympanate insects. - *Proceedings of the Royal Society of London*, 257B: 175–178.
- Papadatou, E., Butlin, R. & Altringham J. (2008) Identification of bat species in Greece from their echolocation calls. - *Acta Chiropterologica*, 10 (1): 127–143.
- Kalčev, B. & Beškov, V. (1963) Die Buldogfledermaus – Vertreter einer neuer Fledermaus-Familie in Bulgarien). – *Bulletin de l'Institut de Zoologie et Musée (Sofia)*, 14: 251-253 (In Bulgarian).
- Pandurska, R. (1992) Second record of *Tadarida teniotis* (Rafinesque, 1814) (Chiroptera, Molossidae) from Bulgaria. – *Acta zoologica Bulgarica*, 45: 102-103.
- Pandourski, I., & Karaivanov. N. (2007) Records of bats (Mammalia: Chiroptera) from Vasilyovska Planina Mountain, Northern Bulgaria. – *Acta zoologica Bulgarica*, 59 (3): 283 – 288.
- Stoycheva, S., Georgiev, D., Pandourski, I. & Tilova. E. (2009) Bat diversity in two large towns of the Upper Thrace, Bulgaria (Chiroptera). - *Lynx, n. s. (Praha)*, 40: 83–93.