

## THE FIRST RECORDS OF MATERNITY COLONIES OF THE SEROTINE BAT, *EPTESICUS SEROTINUS* IN CROATIA

IGOR PAVLINIĆ, MAJA ĐAKOVIĆ & NIKOLA TVRTKOVIĆ

Department of Zoology, Croatian Natural History Museum,  
Demetrova 1, 10000 Zagreb, Croatia

Pavlinić, I., Đaković, M. & Tvrtković, N.: The first records of maternity colonies of the Serotine bat, *Eptesicus serotinus* in Croatia. *Nat. Croat.*, Vol. 20, No. 2., 455–458, 2011, Zagreb.

This paper presents information about the first records of maternity colonies of *Eptesicus serotinus* in Croatia. Records of maternity colonies along with the location where a fertile female was captured are presented on a map.

**Key words:** *Eptesicus serotinus*, distribution, Croatia, nursery colonies

Pavlinić, I., Đaković, M. & Tvrtković, N.: Prvi nalazi porodiljnih kolonija vrste *Eptesicus serotinus* u Hrvatskoj. *Nat. Croat.*, Vol. 20, No. 2., 455–458, 2011, Zagreb.

U radu su prikazani podaci o prvim nalazima porodiljnih kolonija vrste *Eptesicus serotinus* u Hrvatskoj. Na karti su prikazani lokaliteti na kojima su pronađene porodiljne kolonije, kao i lokalitet na kojem je zabilježena fertilna ženka.

**Ključne riječi:** *Eptesicus serotinus*, rasprostranjenost, Hrvatska, porodiljne kolonije

In Croatia, old records of *Eptesicus serotinus* refer to individual animals mostly found during the summer period, with only two records of hibernation and two in the migration period (ĐULIĆ, 1959; ĐULIĆ, 1970; ĐULIĆ & KOVAČIĆ, 1992). The sex ratio of captured adult animals was balanced, with 18 males and 17 females, but no evidence of parturition or lactation has been reported. Recent intensive field work resulted in additional captures with mist-nets and also with a bat-detector. The aim of this note is to report on the first nursery colonies of *E. serotinus* in Croatia along with additional records of both pregnancy and lactation. *E. serotinus* is a widespread species in Croatia and a detailed overview of its distribution is in preparation. Altitudinal distribution ranges from 45 up to 950 m a. s. l. including records from the islands and the Pelješac peninsula. The distribution of the nursery colonies and the record of a pregnant female is presented in Fig. 1.

On May 13th 2009 among the four bat species that we caught in a mist net placed across the dam in front of a spring at Zalužnica was a pregnant female of *E. serotinus*. This was the first evidence of *E. serotinus* reproduction in Croatia (Fig. 1).



**Fig. 1.** The distribution of the first two nursery colonies of *E. serotinus* in Croatia (1 Feričanci church, 2 Orahovica church) and the location where the pregnant female was mist-netted (3 Zalužnica pond).

Considering that the foraging areas are at an average distance of 4.5 km from the roost (DIETZ *et al.*, 2009), up to a maximum of 12 km, we presumed that the nursery colony was somewhere near the place where we caught this pregnant female.

On June 24<sup>th</sup> 2009 we found the first nursery colony registered for Croatia in the church attic in Orahovica and the same day another one in the church attic in Feričanci. In Orahovica we caught a juvenile female. High up in the roof there was a colony consisting of an estimated 10–15 animals, which all hid behind the wooden beams. There were traces of guano all over the attic floor. In Feričanci church we managed to take photographs before the colony crawled under the beams so an estimate of 20–30 animals in the colony could be made by counting from the photographs. Two of the captured animals were females, one of them was adult and the other was subadult. Beneath the colony roosting area we found two dead juvenile animals which were born and died, probably, in the previous year.

The temperature measured in the attic under the colony in Orahovica was 21.6 °C and in Feričanci 23.6 °C. Nursery roosts in Central Europe are almost exclusively in buildings (DIETZ *et al.*, 2009) making this species highly dependent on synanthropic roosts (BATTERSBY, 1999). Apart from the temperature inside the roost, clear access and low disturbance are factors affecting the availability of roosts. Both church lofts

with *E. serotinus* colonies have all their entrances closed with wire making it impossible for bats to fly out directly – the only way out for them is to crawl. One juvenile bat from Orahovica was actually between the wire and the wall very near the exit. The practice of closing church lofts and towers with wire to prevent pigeons from entering is very widespread in Croatia, both on old and renovated churches, resulting in there being almost no bats or colonies in more than 60 churches in the eastern part of the country (Slavonija) (PAVLINIĆ & ĐAKOVIĆ, unpublished data). One of the reasons for this is that many of the churches were damaged or completely destroyed during the war period and the renovation resulted in complete closure.

The presence of *E. serotinus* within a roost is strongly influenced by the immediately surrounding habitat and the amount of foraging habitat within a radius of 1500 m (England, BATTERSBY, 1999). Although it is not a habitat-specific species, it has adapted to human behaviour, resulting in seasonal foraging in a variety of habitats, most of which are closely linked with some form of farming practice (BATTERSBY, 1999; HARBUSCH, 2003; DIETZ *et al.*, 2009).

In Slovenia 12 maternity roosts are known, all of them in churches. The number of females varied between 5 and 75 per site (median = 20) (KRYŠTUFEK & DONEV, 2005). In Serbia *E. serotinus* is considered a common and widespread species but only one breeding roost has been recorded so far (KARAPANDŽA & PAUNOVIĆ, 2009), while in Hungary all summer roosts are in churches, with the largest colony containing over 200 individuals (BIHARI, 2007).

Church lofts represent the most important maternity roosts of *E. serotinus* in the lowland part of Croatia and this species seems to be the only one which is also willing to use lofts that are closed and wired. It is unclear, due to the lack of data, whether this species is undergoing a decline, as is obviously happening with other bat species dependent on buildings and church lofts (eg. *Myotis myotis*, *Plecotus austriacus*, *Plecotus macrobullaris* etc.)

Almost 95 % of rabies virus (EBLV1) records in Europe are recorded from *E. serotinus* (DIETZ *et al.*, 2009) making this species the most important reservoir of this virus (DAVIS *et al.*, 2005). Out of 98 dead bats from Croatia that have tested negative for some kind of rabies virus, only one sample was from *E. serotinus* (PAVLINIĆ *et al.*, 2009). Finding nursery colonies represents an important step for investigating the rabies status of this species in Croatia. Further research should concentrate on finding more nursery colonies of *E. serotinus* in different parts of Croatia where this species possibly uses different roost sites. Also, it is very important for this species, along with any other bat species dependent on buildings as shelters, to change the management of both known and potential roost sites, opening the buildings to allow bats to roost in them more easily.

Received June 13, 2011

## REFERENCES

- BATTERSBY, J. E., 1999: A comparison of the roost ecology of the brown long-eared bat *Plecotus auritus* and the serotine *Eptesicus serotinus*. PhD thesis, University of Sussex.
- BIHARI, Z., 2007: Közönséges keszeidenever *Eptesicus serotinus* (Schreber, 1774). In: BIHARI, Z., CSORBA, G. & HELTAL, M. (eds), Magyarország emlőseinek atlasza. Kossuth Kiadó, Budapest, 107–108.

- DAVIS, P. L., E. C. HOLMES, F. LARROUS, W. H. M. VAN DER POEL, K. TJORNEHOJ, W. J. ALONSO & BOURHY, H., 2005: Phylogeography, population dynamics, and molecular evolution of european bat lyssaviruses. *J. Virol.* **79**, 10487–10497.
- DIETZ, C., O. VON HELVERSEN & NILL, D., 2009: Bats of Britain, Europe and Northwest Africa. A & C Black, London.
- ĐULIĆ, B., 1959: Beitrag zur Kenntnis der geographischen Verbreitung der Chiropteren Kroatiens. *Glasnik prirodnjačkog muzeja Beograd (B 14)*, 67–112.
- ĐULIĆ, B., 1970: Ökologische Beobachtungen der Fledermäuse der Adriatischen Inseln. *Zeitschrift für Säugetierkunde* **35**(1), 45–51
- ĐULIĆ, B. & KOVAČIĆ, D., 1992: History of research on bats in Dalmatia. *Prague Studies in Mammalogy*, 27–29.
- HARBUSCH, C., 2003. Aspects of the cology of Serotine bats (*Eptesicus serotinus*) in contrasting landscapes in southwest Germany and Luxembourg, pp. 217, University of Aberdeen.
- KRYŠTUFEK, B. & REŽEK DONEV, N., 2005: The Atlas of Slovenian Bats (Chiroptera). *Scopolia, Journal of the Slovenian Museum of Natural History*, **55**, 1–92.
- KARAPANDŽA, B. & PAUNOVIĆ, M., 2009 National report on the implementation of the agreement on the conservation of bats in Europe 2005.
- PAVLINIĆ, I., ČAČ, Ž., LOJKIĆ, I., ĐAKOVIĆ, M., BEDEKOVIĆ T. & LOJKIĆ, M., 2009: Šišmiši biološki rezervoari i potencijalni prijenosnici lyssavirusa. *Vet. Stanica* **40** (5), 297–304.