

On urbanisation of *Nyctalus noctula* and *Pipistrellus pygmaeus* in Slovakia

Martin ČEĽUCH¹, Štefan DANKO² & Peter KAŇUCH^{3,4}

¹ Department of Ecology, Slovak University of Agriculture, Mariánska 10, 949 76 Nitra, Slovakia; mato@netopiere.sk

² Museum of Zemplín, Kostolné námestie 1, 071 01 Michalovce, Slovakia; danko.stefan@slovanet.sk

³ Institute of Forest Ecology SAS, Štúrova 2, 960 53 Zvolen, Slovakia; kanuch@netopiere.sk

⁴ Institute of Vertebrate Biology AS CR, 675 02 Studenec 122, Czech Republic

Abstract. The reproduction of *Nyctalus noctula* in a building in Slovakia was confirmed. It is in accordance with considerable increasing of the species occurrence in urban habitats during the last years. The first roost of *Pipistrellus pygmaeus* in Slovakia was found in a prefab house. Few individuals were mixed with *Pipistrellus pipistrellus* during spring migrating period. Subsequently, the first nursery of *P. pygmaeus* in Slovakia was confirmed in the similar urban habitat. Conservation activities in prefab buildings should consider this fact.

***Nyctalus noctula*, *Pipistrellus pygmaeus*, roosts, reproduction, first records**

The noctule, *Nyctalus noctula* (Schreber, 1774), is widely distributed and common bat in Slovakia over the whole year, including summer, migrating and winter period (Danko et al. 2004). Except for natural shelters (tree-hollows and rock crevices), species also often occurs in artificial shelters – prefab houses (e.g. Kaňuch & Čeľuch 2000, Lehotská & Lehotský 2000, Čeľuch & Kaňuch 2002, Danko et al. 2004). Slovakia reaches the southern boundary of the species nursing area and is occupied almost exclusively by males during the breeding period (cf. Strelkov 2000, Kaňuch & Čeľuch 2004). Up to present, only one small reproductive tree-dwelling colony of noctules was known in southern-central Slovakia (Kaňuch & Čeľuch 2004). Current distribution of the soprano pipistrelle, *Pipistrellus pygmaeus* (Leach, 1825), as well as its ecology is completely unknown in Slovakia. Thanks to conspicuous ultrasound signals, the occurrence of the species was documented only by few bat-detector records there (Danko & Pjenčák 2002, Fulín 2002, Kaňuch & Krištín 2003, authors' unpublished data). The aim of this note is to present the first record of *N. noctula* reproduction in urban conditions and the first records of roosts and reproduction of *P. pygmaeus* in Slovakia.

The initial information of bats occurrence provided the inhabitants which have found bats inside their houses. Subsequent visual observations of bats during the evening emergence from buildings and the species identification were performed with the help of the ultrasound bat-detectors Pettersson D200 or D240x and Sony MiniDisc recorder. If was possible, bats were caught, and the sex and age was determined (at least from their cadavers). Because of correct determination in cryptic species, tissue samples of wing membrane from caught individuals of *P. pygmaeus* were collected for further DNA analysis (Kaňuch et al. in press).

On 22 June 2005, the evening emergence of noctules (ca 100 individuals) from the roost was observed in two-storey building of the town hall in Šoporňa (SW Slovakia, Nitrianska pahorkatina Hills; DFS 7772; 48° 15' N, 17° 49' E; 129 m a. s. l.). After the strong storm on 6 July 2005, 32 fresh cadavers of *N. noctula* lactating females and non-volant young were found in the drainpipe of this building. The roost entrance (in height of 9 m) was 5 cm wide crevice in the wall along the drainpipe. Bats roosted behind the cladding sheet or inside the larger space of roof attic where were found during the hot summer days. Bats accidentally penetrated into the rooms probably just in this time. On the opposite side of the roof, one smaller colony (minimally 10 individuals) of the serotine, *Epiesicus serotinus* (Schreber, 1774), was found, too. Since the drainpipe presented dangerous trap for bats and individuals inside the building caused problems for inhabitants, the roost

entrance was enclosed after the dispersal of bats from the nursery colony on 21 August 2005. Our finding is the second record of noctule reproduction in Slovakia but the first record in the building, respectively.

On 16 May 2004 in a multi-storey prefab house in Žiar nad Hronom, SNP St. (C Slovakia, Žiarska kotlina Basin; DFS 7479; 48° 35' N, 18° 51' E; 226 m a. s. l.), the mixed roost (ca 60 individuals) of two cryptic species – *P. pygmaeus* and the common pipistrelle, *Pipistrellus pipistrellus* (Schreber, 1774), was observed during the evening emergence. Among individuals of common pipistrelle, few individuals of *P. pygmaeus* were recorded. According to Dietz & von Helversen (2004), two bat species emitted different peak frequencies of the 56.2 and 44.6 kHz, respectively (recorded around 20 m apart the building, Fig. 1). Bats used a narrow shelter behind the wooden cladding beside the window on the fourth floor. Several days later, bats left the roost and the house owners enclosed the entrance crevice. Date of observation and the behaviour of bats suggest the temporary migrating assemblage. On 17 July 2006 in similar multi-storey prefab house in Trebišov, Cintorínska St. (E Slovakia, Východoslovenská rovina Lowland, DFS 7396; 48° 36' N, 21° 43' E; 109 m a. s. l.), a nursery roost of *P. pygmaeus* was found on the last (eight) floor under the roofing sheet of the balcony (with south aspect). During evening emergence several tens of bats were observed. Six young males and four young females were caught and thanks the PCR-based identification test (Kaňuch et al. in press), individuals were determined as *P. pygmaeus*. Inhabitants suggested occurrence of more than 60 bats during whole summer season. Moreover, finding of one non-volant young cadaver confirmed breeding in this roost, too. Compared with the previous first known roost of species in Slovakia, the record from Trebišov presents the first known nursery shelter, as well as the definite species reproduction in our area.

Further observation of the noctule breeding corresponds with altitude and latitude of the first known nursery colony. It confirms supposition about possible occurrence of small isolated reproductive populations in lowland parts of the southern Slovakia (Kaňuch & Čelúch 2004). Finding of the breeding in artificial conditions is in accordance with considerable increasing of the species occurrence in urban habitats during the last years in Slovakia (Čelúch & Kaňuch 2002). The soprano pipistrelle is considered as more forest-dwelling species (cf. Bartonička & Řehák 2004). However, records of *P. pygmaeus* in the urban habitat suggest occurrence of the species also in other sites in Slovakia, where its relative is commonly roosting in the buildings. Generally, conservation activities in prefab buildings (i.e. mainly evacuation of bats) should consider this fact there.

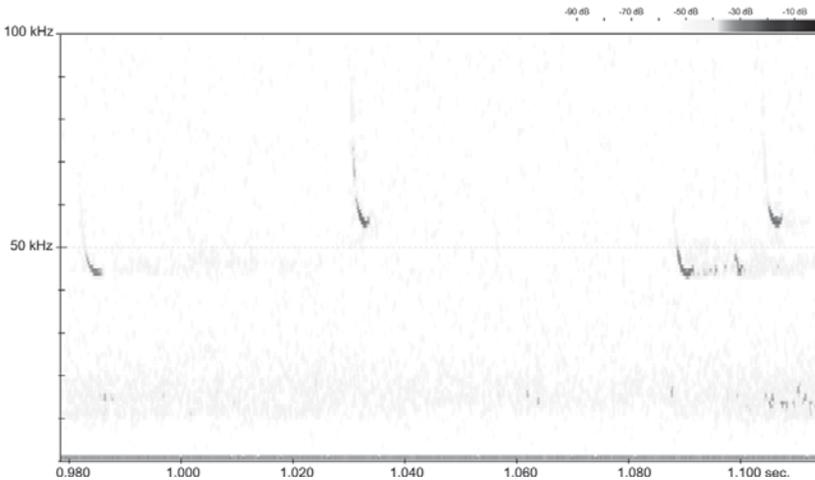


Fig. 1. Simultaneous recording of ultrasound signals of *Pipistrellus pygmaeus* (peak frequency 56.2 kHz) and *Pipistrellus pipistrellus* (44.6 kHz) leaving the common roost from the building (Žiar nad Hronom, Central Slovakia).

Obr. 1. Súčasná nahrávka ultrazvukových hlasov *Pipistrellus pygmaeus* (vrcholová frekvencia 56,2 kHz) a *Pipistrellus pipistrellus* (44,6 kHz) počas ich výletu zo spoločného úkrytu v budove (Žiar nad Hronom).

Acknowledgements

We are indebted to Miloš Balla for his help in the field. The manuscript was improved thanks to critical comments of Tomáš Bartonička and the language revision of Sally Phillips. The work was partly supported by the Grant Agency of the Czech Republic (Project No. 206/06/0954).

Súhrn

O urbanizácii raniaka hrdzavého (*Nyctalus noctula*) a večernice Leachovej (*Pipistrellus pygmaeus*) na Slovensku. Po prvýkrát bolo na Slovensku zaznamenané rozmnožovanie sa *Nyctalus noctula* v budove (Šoporňa), čo je vo všeobecnom súlade s narastajúcim výskytom tohto druhu v urbánom prostredí v posledných rokoch. Prvý známy úkryt *Pipistrellus pygmaeus* na Slovensku bol nájdený v panelovej budove (Žiar nad Hronom). Netopiere počas obdobia jarných preletov osídľovali úkryt spoločne s *Pipistrellus pipistrellus*. Následne bol po prvýkrát na Slovensku nájdený aj reprodukčný úkryt *P. pygmaeus*, tiež v podobnom prostredí (Trebišov). Opatrenia na ochranu netopierov v budovách by mali zohľadňovať aj tento fakt.

References

- BARTONIČKA T. & ŘEHÁK Z., 2004. Flight activity and habitat use of *Pipistrellus pygmaeus/mediterraneus* in a floodplain forest. *Mammalia*, **68**: 365–375.
- CELUCH M. & KAŇUCH P., 2002: Problémy s výskytom raniaka hrdzavého (*Nyctalus noctula*) v panelových stavbách [Problems of the occurrence of the noctule (*Nyctalus noctula*) in prefabs]. Pp.: 160–161. In: BRYJA J. & ZUKAL J. (eds): *Zoologické dny. Brno 2002. Sborník abstraktů z konference 14.–15. února 2002* [Zoological Days. Brno 2002. Abstracts to the Conference, 14–15 February 2002]. Ústav biologie obratlovců AV ČR, Brno, 191 pp (in Slovak).
- DANKO Š. & PIENČÁK P., 2002: Nové poznatky o výskytu netopierov na východnom Slovensku II [New data on the bat occurrence in Eastern Slovakia]. *Natura Carpatica*, **43**: 137–172 (in Slovak, with a summary in English).
- DANKO Š., KÜRTHY A., OBUCH J., MATIS Š. & PIENČÁK P., 2004: Rozšírenie netopierov na Slovensku, časť 4: raniaky (*Nyctalus noctula*, *Nyctalus leisleri* a *Nyctalus lasiopterus*) [Distributional patterns of bats in Slovakia, part 4: genus *Nyctalus*]. *Natura Carpatica*, **45**: 163–204 (in Slovak, with an abstract in English).
- DIETZ C. & VON HELVERSEN O., 2004: *Illustrated Identification Key to the Bats of Europe*. Electronic publication, version 1.0.
- FULÍN M., 2002: Bat detector workshop 2001. *Natura Carpatica*, **43**: 297–298 (in Slovak).
- KAŇUCH P. & CELUCH M., 2000: Výskyt *Nyctalus noctula* v panelových budovách mesta Prešov v rokoch 1998–1999 [The occurrence of *Nyctalus noctula* in prefabs in Prešov in 1998–1999 (E-Slovakia)]. *Vespertilio*, **4**: 146–148 (in Slovak, with an abstract in English).
- KAŇUCH P. & CELUCH M., 2004: On the southern border of the nursing area of the noctule in Central Europe. *Myotis*, **41–42**: 125–127.
- KAŇUCH P. & KRISTÍN A., 2003: Netopiere (Chiroptera) južnej časti Krupinskej planiny [Bats (Chiroptera) of the southern part of the Krupinská planina Plateau]. *Ochr. Prír.*, **22**: 165–168 (in Slovak).
- KAŇUCH P., HÁJKOVÁ P., ŘEHÁK Z. & BRYJA J., in press: A rapid PCR-based test for species identification of two cryptic bats *Pipistrellus pipistrellus* and *P. pygmaeus* and its application on museum and dropping samples. *Acta Chiropterol.*
- LEHOTSKÁ B. & LEHOTSKÝ R., 2000: Skúsenosti z ochrany zimnej kolónie raniaka hrdzavého (*Nyctalus noctula*) v panelovom dome na bratislavskom sídlisku Dlhé Diely [Experiences of protecting the winter colony of *Nyctalus noctula* in a prefab at the Bratislava housing estate Dlhé Diely (Slovakia)]. *Vespertilio*, **4**: 105–110 (in Slovak, with an abstract in English).
- STRELKOV P. P., 2000: Seasonal distribution of migratory bat species (Chiroptera, Vespertilionidae) in Eastern Europe and adjacent territories: nursing area. *Myotis*, **37**: 7–25.

received 18. 9. 2006