

First capture of the greater noctule bat *Nyctalus lasiopterus* (Schreber, 1780) individuals in Slovenia

Prvi ulov osebkov velikega mračnika *Nyctalus lasiopterus* (Schreber, 1780) v Sloveniji

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The greater noctule bat, *Nyctalus lasiopterus* (Schreber, 1780), is the largest bat species in Europe and one of the Europe's rarest and most enigmatic bats (Popa-Lisseanu et al. 2009, Dietz & Kiefer 2014). This tree-dwelling species is largely dependent on mature, preferably deciduous and mixed forests (Popa-Lisseanu et al. 2009, Alcalde et al. 2016). Hunting grounds are usually in forests and in the vicinity of water (Estók 2011, Uhrin et al. 2016), where bats fly 10–20 m above the ground (Alcalde et al. 2016). Its distribution range extends over central and southern Europe and reaches into the Mediterranean region – from the Iberian Peninsula to the Balkans (Ibáñez et al. 2004, Dietz & Kiefer 2014, Alcalde et al. 2016). It is considered »vulnerable« in the IUCN Red List of Threatened Species (Alcalde et al. 2016) and listed as »data deficient« in the Slovenian Red List of endangered species (Ur. l. RS 2002). Until recently, the only record of the species for Slovenia referred to historical data from Piran in the southwestern part of the country (Dal Piaz 1927). Due to the species presence in the neighbouring countries (Vergari et al. 1997, Tvrtković & Baltić 1996, Estók 2011) and its migratory behaviour, it was assumed that it at least occasionally occurs in the country (Petrinjak 2009). It was only recently that the species was confirmed at a few locations in southern Slovenia, by recording its echolocation calls (Presetnik & Knapič 2015, Presetnik 2017, Presetnik & Šalamun 2019). Here, we present the first record of captured individuals of this species in Slovenia.

During the fieldwork carried out by the bat research group within the framework of the »Biological Research Camp for High School Students 2017«, we used different methods to inventory bats in the region around Gračiče in SW Slovenia. On the

evening of 27. 6. 2017, we set the mist nets around approximately 25 × 35 m large pond on the hilltop, 350 m east of the village Poletiči (lat. 45.4957 °N, long. 13.8679 °E; 340 m a.s.l.). The pond is situated at the eastern end of the forested Istria's hilly area, with sub-Mediterranean climate (Ogrin 1996). The pond's bank was not overgrown with any vegetation and water surface was mainly open. However, the dense mixed forest of planted *Pinus nigra* and of *Quercus pubescens*, *Ostrya carpinifolia* and *Fraxinus ornus* surrounded the pond approx. 10 m away on the NE and SE sides. We used four mist nets, three (two polyester 12 × 3 m and one nylon 15 m × 2.5 m) were erected right on the NE and E sides of the pond's banks, while one (polyester 12 × 3 m) was set approximately 10 m away from the E side of the pond, right along the forest edge. Mist nets were erected at sunset (20:57) and checked every few minutes until 1:00 a.m. next day. The captured bats were immediately taken from the nets and processed; we measured their weight (using Pesola 60 g scale, 0.5 g accuracy), forearm length (calliper, 0.1 mm accuracy) and determined their age, sex and reproductive status (Haarsma 2008, Dietz & Kiefer 2014). After determining the species, we released the individuals at the same site in the shortest time possible.

At 23:34, a distinctly large bat was caught in the centre of the 15 m mist-net at the eastern pond's bank at a height of approximately 1.5 m. The second individual was caught at the same point at 00:33. Both bats were flying from NE of the outer side of the pond (Fig. 1a). They were measured (Tab. 1) and identified as *Nyctalus lasiopterus* (Dietz & Kiefer 2014). In the hour between these two captures, another similar sized bat flew in the same net, but managed to escape before our arrival at the spot. Based on its size and strength, it could also have been *N. lasiopterus*. Both inspected individuals (Tab. 1) were adult sexually mature male greater noctules, with well-developed buccal glands (Fig. 1b) and enlarged testicles (Fig. 1c). At the back of one individual's head there was a small distinct white patch of fur (Fig. 1d), which could indicate an example of piebaldism – total local lack of fur pigment (Lucati & López-Baucells 2016). The overall observed bat assemblage was diverse with additional species: *Hypsugo savii*, *Pipistrellus kuhlii*, *Nyctalus leisleri*, *Myotis myotis*/M. *oxygnathus*, *M. mystacinus* and *Plecotus macbullaris*.

Table 1. Measurements of the greater noctule bats (*Nyctalus lasiopterus*) caught in the mist nets at the pond near Poletiči in southwestern Slovenia at the night from 27. to 28. 6. 2017. Abbreviations: AB – forearm length, D3 – third finger length, D5 – fifth finger length, T – testicles, E – epididymis. Reproductive status is described with a four-level estimate of enlargement: »/« – not swollen, »+« – slightly swollen, »+++« – intermediate, »++++« – very obviously and largely swollen.

Tabela 1. Meritve velikih mračnikov (*Nyctalus lasiopterus*), ujetih v mreže ob kalu pri Poletičih v jugozahodni Sloveniji v noči 27. / 28. 6. 2017. Okrajšave: AB – dolžina podlakti, D3 – dolžina tretjega prsta, D5 – dolžina četrtega prsta, T – moda, E – obmodki. Razmnoževalni status je opisan s štiristopenjsko lestvico povečanja: »/« – niso zatečeni, »+« – rahlo zatečeni, »+++« – srednje zatečeni, »++++« – zelo očitno in močno otečeni.

Species	Sex	Age	AB [mm]	Weight [g]	D3 [mm]	D5 [mm]	Reproductive status	Time of capture
<i>Nyctalus lasiopterus</i>	male	adult	65.1	53.0	116.0	71.5	T: ++, E: +	23:34
<i>Nyctalus lasiopterus</i>	male	adult	66.0	54.0	/	/	T: ++, E: /	00:33



Figure 1. a) Greater noctule bat (*Nyctalus lasiopterus*) caught near Poletiči, SW Slovenia (photo: Simon Zidar). b) Enlarged buccal glands of the caught male (photo: Živa Bombek). c) Enlarged testicles (photo: Simon Zidar). d) White tuft of hair at the back of the bat's head indicates piebaldism (photo: Simon Zidar).

Slika 1. a) Veliki mračnik (*Nyctalus lasiopterus*), ujet pri Poletičih v JZ Sloveniji (foto: Simon Zidar). b) Povečane bukalne žleze ujetega samca (foto: Živa Bombek). c) Močno povečani testisi (foto: Simon Zidar). d) Svetel šop dlak na zatilju nakazuje piebaldizem (foto: Simon Zidar).

Our observation represents the first recent capture of individuals of *N. lasiopterus* in Slovenia. As the species normally flies high above treetops (Alcaldé et al. 2016), we assume that we interrupted the individuals during their drinking attempts. The records of the caught individuals of this species are rare also in the neighbouring Italy (Vernier & Vedovato 2011, Lapini et al. 2014) and Croatia (Kovač et al. 2011, Mazija et al. 2015), where only males had been reported. The nearest known large population of *N. lasiopterus* inhabits the northern part of Hungary, where it was observed in woodland sites associated with running or standing waters (Estók 2011, Uhrin et al. 2016). Recent observations of *N. lasiopterus* (Presetnik & Knapič 2015, Presetnik 2017, Presetnik & Šalamun 2019, this study) indicate that the species regularly occurs in Slovenia, at least in its Mediterranean part. However, it is unclear whether the observed bats constitute the resident population or are just vagrant animals detected during their migration. Additional research, especially at forested water sites, should reveal more records, and at the same time greatly contribute to a better understanding of the species' distribution and ecology in this part of Europe.

Acknowledgements

We would like to thank two anonymous reviewers for the valuable comments that strongly improved the manuscript. Additionally, we want to acknowledge Matija Mlakar Medved, Nejc Poljanec and Živa Bombek for their assistance in the field. Special thanks are due to Nino Kirbiš from the Slovenian Herpetological Society for the organization of the camp. The research work would not have been possible without the equipment borrowed from the Slovenian Association for Bat Research and Conservation and Monika Podgorelec.

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