

Noteworthy records of northern bat *Eptesicus nilssonii* (Chiroptera: Vespertilionidae) in the Tatra Mountains

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Abstract. During the research concerning the present and postglacial bat fauna of the Polish Tatra Mts, the authors noted some high situated localities of *Eptesicus nilssonii*. This extends the vertical spectrum of its species occurrence in the Tatras and Central Europe. In winter, the bat reaches alt. 1906 m (the Wielka Litworowa Cave). In summer it was observed at an altitude of up to 2065 m (The Mułowa Pass). The subfossil remains of the northern bat were found at height 1851 m a.s.l. in the Jasny Awen Cave. The Czarna Cave, with 28 individuals, is the most important winter locality of this bat in Poland and the Carpathians.

Key words: vertical distribution, hibernation, bats, Carpathians, Poland, cave.

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I. INTRODUCTION

The northern bat *Eptesicus nilssonii* (KEYSERLING et BLASIUS, 1839) is a Palaearctic species with a boreal-alpine type of range, which is characteristic for several cold-loving species. In Europe it occurs in Scandinavia, Estonia, Latvia, and Lithuania, in the southern parts of Germany, France, Switzerland, Austria, Czech, Slovakia, Poland and Hungary (RYDELL 1993, 1999; SCHÖBER & GRIMBERGER 1998). It is the only bat species observed beyond the polar circle and it reaches up to 70° 25' of northern latitude (SYVERTSEN et al. 1995). The northern bat occurs throughout Poland (RUPRECHT 1983) and is classified as belonging to the category NT (Near Threatened) (WOŁOSZYN 2001). The northern bat with the whiskered bat *Myotis mystacinus* (KUHL, 1817) is the most characteristic bat of the Polish Tatras, where it is commonly found but not numerously. It was noted in over 20 localities (KOWALSKI 1953, RUPRECHT 1983, KEPEL 1995, PIKSA 1998). This species was also found at the base of the Tatras: in town of Zakopane (CICHOCKI 1993) and the Gubałówka Hill (HARMATA 1990).

II. RESULTS AND DISCUSSION

The authors found *Eptesicus nilssonii* in the following localities:

1. The Lodowa w Ciemniaku Cave (alt. 1715 m). It lies in the North-West slope of Mount Ciemniak. The length of known corridors is 390 metres with 42 metres of denivelation (-11, +31) (SIARZEWSKI 1994). It is the largest ice cave in Poland. The cubature of ice covering was valued at 1500 m³ in the sixties. It is the highest situated locality where the wintering northern bat has been regularly observed. The cave was penetrated during four winter seasons, and hibernating *E. nilssonii* were noted every time (13th February 1997 – 3 individuals, 7th December 1997 – 3 individuals, 4th January 1999 – 2 individuals, 21st January 2001 – 6 individuals).

2. The Wielka Litworowa Cave (alt. 1906 m) lies in the Mount Małolączniak (the Czerwone Wierchy Massif) and is the highest situated cave of the Wielka Śnieżna Cave System (the Great Snow Cave System) – the deepest cave in the Tatras and Carpathians (JOKIEL 1997). Two specimens of hibernating *E. nilssonii* were observed on 27th December 2000. It had never been noted there during the winter censuses in the years 1994-1999.

3. The Jasny Awen Cave (alt. 1851 m) lies in the Kotliny (the Czerwone Wierchy Massif), and is one of the caves of the Wielka Śnieżna Cave System (JOKIEL 1997). In autumn 1998 (7th November) the subfossil mandible of a northern bat were collected there.

4. The Mułowa Pass (alt. 2065 m) lies in the main ridge of the Western Tatras between Mount Ciemniak and Mount Krzesanica (CYWIŃSKI 1996). An adult male of the northern bat was captured on 11 September 1999.

5. The Czarna Cave (alt. 1326 m., alt. 1294 m, and alt. 1404 m) lies in the Organy Massif, in the Kościeliska Valley. The length of known corridors is about 6500 m, with 303,5 m of denivelation (GRODZICKI et al. 1995). It is the most numerous hibernaculum of *E. nilssonii* in Poland. The cave was controlled during the following six seasons: 2nd February 1997 – 26 individuals, 4th February 1998 – 26 individuals, 2nd February 1999 – 25 individuals, 10th February 2000 – 21 individuals, 7th February 2001 – 21 individuals, 2nd March 2002 – 28 individuals.

All the described localities are situated in the Western Tatra Mts. (UTM DV 15).

E. nilssonii is one of the rarest bats noted during the winter censuses in Poland and it composes less than 0,1% of winter bat fauna (WOŁOSZYN 1994). Its number is high only in the Tatra Mts where it constitutes 11,5% of bats hibernating in caves (PIKSA & NOWAK 2000). The Czarna Cave is the largest winter quarter of this species in Poland. Up to the present the number of *E. nilssonii* noted in hibernacula was fewer than 10 individuals: Nad Miłkowem Adit – max 7 individuals (SZKUDLAREK & PASZKIEWICZ 1999) and Zimna Cave – max 8 individuals (KEPEL 1995). The Czarna Cave is the largest known winter quarter of *E. nilssonii* in the Tatra Mts and Carpathians (c.f. ZUKAL & GAISLER 1989) and together with the mines “Simon and Juda” and the bunker Bouda in Central Europe (c.f. ŘEHÁK & GAISLER 1998). The Wielka Litworowa Cave (winter season) and the Mułowa Pass (season of activity) are the highest situated localities of the northern bat in Poland, in the Tatras and Carpathians. So far the has been known from the localities lying in the forest zone in summer (KOWALSKI 1962), in winter reaching 1710 (PIKSA 1998). In the Slovak Tatras the northern bat was recorded in the hibernation season in the Murańska Cave alt. 1559 m (ZUKAL & GAISLER 1989), and from the summer - in the Litvorov Žláb alt. 1450 m (MOŠANSKÝ & GAISLER 1965). The Jasny Awen Cave is the highest situated object in this region where remains of this species were collected. Untill now its bones were found up to 1762 - the Wiszących Want Cave (WOŁOSZYN 1970). *E. nilssonii* is the species which has one of the greatest vertical range of occurrence of all bat species occurring in the continent of Europe. In the Bulgarian mountains it is the only bat species noted above alt. 2000 m (HANÁK & HORÁČEK 1986). Recently, in the Alpine caves

* current altitude, WOŁOSZYN (1970) gives out-of-date altitude alt. 1800 m.

the northern bat has been recorded at alt. 2200 m (SPIZENBERGER 1986), and its remains were found even higher in Rottalhöhle cave in the Jungfrau Massif, at alt. 2480 m (JORDI 1978). Outside the caves it is noted: in France reaching alt. 2200 m (ARLETTAZ & CATZEFLIS 1990), in the Austrian Alps up to 2300 m (SPITZENBERGER 1986), and in the Swiss Alps up to alt. 2700 m (AELLEN 1961). Outside Europe, for example in Tibet *Eptesicus nilssonii centralasiaticus* BOBRINSKOI 1926, was noted even on alt. 4900 m (RYBERG 1947).

REFERENCES

- AELLEN V. 1962. Le baguement des chauves-souris au col de Bretolet (Valais). *Archives des Sciences*, **14**(3): 365-392.
- ARLETTAZ R., CATZEFLIS F. 1990. Reprise in natura d'une Sérotine boréale, *Eptesicus nilssonii*, âgée d'au moins 15 ans. *Le Rhinolophe*, **7**: 37.
- CICHOCKI W. 1993. Ssaki. [Mammals]. [In:] Z. MIREK, H. PIĘKOŚ-MIRKOWA (eds) – Przyroda Kotliny Zakopiańskiej. [Nature of the Zakopane Dale]. TPN, Kraków-Zakopane. *Tatry i Podtatrze*, **2**: 221-225. [In Polish].
- CYWIŃSKI W. 1996. Tatry – przewodnik szczegółowy. Tom 3 – Masyw Czerwonych Wierchów. Część zachodnia. [Tatras – Detailed Guide. Vol. 3 - Czerwone Wierchy Massif. Western part]. Wydawnictwo Górskie, Poronin. [In Polish].
- GRODZICKI J., KONDRATOWICZ R., KOTARBA S., LUTY I., RECIELSKI K., ZYZAŃSKA H. 1995. Jaskinia Czarna. [Czarna cave]. [In:] J. GRODZICKI (ed.) – Jaskinie Tatr Polskich, Tom 5. Wielkie jaskinie Doliny Kościelińskiej. [The Caves of the Polish Tatra Mountains, Vol. 5. Great Caves of the Kościeliska Valley]. PTPNoZ, TPN, Warszawa. Pp: 101-126. [In Polish].
- HANÁK V., HORÁČEK I. 1986. Zur Südgrenze des Areals von *Eptesicus nilssonii* (Chiroptera: Vespertilionidae). *Annalen des Naturhistorisches Museum in Wien*, **88-89B**: 377-388.
- HARMATA W. 1990. Researches on occurrence, ethology and ecology of the bats *Chiroptera* on Gubałówka Elevation in the Carpathians. *Studia Ośrodka Dokumentacji Fizjograficznej*, **18**: 263-273. [In Polish with English summary].
- JOKIEL W. 1997. Exploration of the deepest cave in Poland – Jaskinia Wielka Śnieżna. *Jaskinie*, **7**: 12-13.
- JORDI M. 1978. Die Rottalhöhle (Jungfraugebiet). *Stalactite*, **28**(2): 88-92.
- KEPEL A. 1995. Bats hibernating in caves of the Tatra Mountains – results of censuses conducted in 1992/93, 93/94 and 94/95 seasons. *Przegląd Przyrodniczy*, **6**(2): 75-80. [In Polish with English summary].
- KOWALSKI K. 1953. Material relating to the distribution and ecology of cave bats in Poland. *Fragmenta Faunistica Musei Zoologici Polonici*, **6**(21): 541-567. [In Polish with English summary].
- KOWALSKI K. 1962. Mammals. [In:] W. SZAFER (ed.) – Tatra National Park. Zakład Ochrony Przyrody PAN, Kraków. Pp: 265-388. [In Polish with English summary].
- ŘEHÁK Z., GAISLER J. 1998. Long-term changes in the number of bats in the largest man-made hibernaculum of the Czech Republic. *Acta Chiropterologica*, **1**(1): 113-123.
- MOŠANSKÝ A., GAISLER J. 1965. Ein Beitrag zur Erforschung der Chiropterenfauna der Hohen Tatra. *Bonner zoologische Beiträge*, **16**(3-4): 249-267.
- PIKSA K. 1998. The chiroptero fauna of the Polish Tatra Mountains. *Vespertilio*, **3**: 93-100.
- PIKSA K., NOWAK J. 2000. The bat fauna of the Polish Tatra Caves. [In:] B. W. WOŁOŻYŃ (ed.) – Proceedings of the VIIIth EBRS. Vol. 1. Approaches to Biogeography and Ecology of Bats. CIC ISEZ PAN, Kraków. Pp: 181-190.
- RUPRECHT A. 1983. Bats (Chiroptera). [In:] Z. PUCEK, J. RACZYŃSKI (eds) – Atlas of Polish Mammals. PWN, Warszawa. Pp: 27-82. [In Polish with English summary].
- RYBERG O. 1947. Studies on bats and bat parasites. Bokförlaget Svenk Natur, Stockholm.
- RYDELL J. 1993. *Eptesicus nilssonii*. *Mammalian Species*, **430**: 1-7.
- RYDELL J. 1999. *Eptesicus nilssonii* (KEYSERLING & BLASIUS, 1839). [In:] A. J. MITCHELL-JONES, G. AMORI, W. BOGDANOWICZ, B. KRYŠTUFEK, P. J. H. REIJNDERS, F. SPITZENBERGER, J. B. M. THISSEN, V. VOHRALÍK, J. ZIMA (eds) – The Atlas of European Mammals. T. and A. D. Poyser, London. Pp: 140-141.
- SCHOBER W., GRIMBERGER E. 1998. Die Fledermäuse Europas. Stuttgart, Kosmos.
- SIARZEWSKI W. 1994. Jaskinia Lodowa w Ciemniaku. [Lodowa in Ciemniak Cave]. [In:] J. GRODZICKI (ed.) – Jaskinie Tatr Polskich, Tom 5. Jaskinie Wąwozu Kraków. [The Caves of the Polish Tatra Mountains, Vol. 5. The Caves of Gully Kraków]. PTPNoZ, TPN, Warszawa. Pp: 142-153. [In Polish].
- SPITZENBERGER F. 1986. Die Nordfledermaus (*Eptesicus nilssonii* KEYSERLING & BLASIUS, 1839) in Österreich. *Mammalia Austriaca* 10 (Mammalia, Chiroptera). *Annalen des Naturhistorisches Museum in Wien*, **87B**: 117-130.

- SYVERTSEN P. O., STORMARK T. A., NORDSETH M., STARHOLM T. 1995. A tentative assessment of bat diversity and distribution in Norway. *Myotis*, **32-33**: 183-191.
- SZKUDLAREK R., PASZKIEWICZ R. 1999. Die Winter-Aufenthaltsorte seltener Fledermausgattungen in den Westsudeten. *Przyroda Sudetów Zachodnich*, **2**: 83-88. [In Polish with German summary].
- WOŁOSZYN B. W. 1970. The Holocene bat fauna (*Chiroptera*) from the caves of the Tatra Mountains. *Folia Quaternaria*, **35**: 1-52. [In Polish with English summary].
- WOŁOSZYN B. W. 1994. Winter Bat Censuses (DSN: 1988-1992) in the five year perspective – summary. [In:] B. W. WOŁOSZYN (ed.) – Results of the winter bat census in Poland: 1988-1992. CIC ISEZ PAN, Kraków. Pp: 186-218. [In Polish with English summary].
- WOŁOSZYN B. W. 2001. *Eptesicus nilssonii* (Keyserling et Blasius 1839). [In:] Z. GŁOWACIŃSKI (ed.) – Polish Red Book of Animals. PWRiL, Warszawa. Pp: 56-58. [In Polish with English summary].
- ZUKAL J., GAISLER J. 1989. On the occurrence and changes in the abundance of *Eptesicus nilssonii* (KEYSERLING & BLASIUS, 1839) in the Czechoslovakia. *Lynx*, n. s. **25**: 83. [In Czech with English summary].