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HIBERNATION OF PARTI-COLOURED BAT, *VESPERTILIO MURINUS* (CHIROPTERA, VESPERTILIONIDAE), IN BELARUS

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Hibernation of Parti-Coloured Bat, *Vespertilio murinus* (Chiroptera, Vespertilionidae), in Belarus.
Shpak, A. V. — Parti-coloured bat (*Vespertilio murinus* Linnaeus, 1758) was considered in Belarus as a migrant species until recently. This point of view was based on the absence of winter records as well as the registrations in Austria and Romania of two *V. murinus*' specimens, banded in Belarus. The data, obtained over the past few years, allow to state, that the whole territory of Belarus belongs to the winter range of this species. Hibernating animals were observed exclusively in the anthropogenic roosts.
Key words: *Vespertilio murinus*, Belarus, hibernation.

Introduction

Parti-coloured bat (*Vespertilio murinus* Linnaeus, 1758) is one of the common species of bats (Chiroptera) for the territory of Belarus. Its area extends from eastern France across Europe, and, limited by southern Scandinavia and northern Balkan Peninsula, to the east — to China, northern Pakistan and Korean Peninsula.

According to the analysis of banding data for the territory of Europe (Hutterer et al., 2005), *Vespertilio murinus* is a distant migrant, whose seasonal movements are documented and proven (Baagøe, 2001). Migration directions are mainly from NE to S and SW; their distance, with a few exceptions, varies from 132 km to 846 km. As hibernating roosts *V. murinus* uses caves, tunnels, underground structures, and high buildings, which are equivalent to natural roosts in urban landscapes and, thus, belongs to the group of epilithic species (Klausnitzer, 1987).

Absence of winter records and registrations of banded individuals in Austria (Kepka, 1962) and Romania (Kurskov, 1965) allowed A. N. Kurskov to consider this species as migrant for the territory of Belarus. According to his data, migration period of *V. murinus* in the Belaveža Forest lasts from late July to late August. In spring, the first specimens (mostly female) appear in the second half of May.

P. P. Strelkov (2001) lined the northern border of the hibernating area of *V. murinus* through the Northern Caucasus, Transcarpathia, Czech Republic to the north, along the Oder and Elbe interfluvium to the coast of the Baltic Sea. Nevertheless, he recorded some findings of hibernating individuals north on this line and characterized them as the “attempts” of individuals to hibernate in the summer area. Successful hibernating was noticed only in Moscow, where small population of sedentary *V. murinus* exists (Morozov, 1998). Besides, four animals were noticed in Saint Petersburg in winter 2005–2006 (Bogdarina, 2006) and two — in Penza in winter and spring 2005 (Zolina, 2007).

From the middle 2000th the autumn males vocalizations and some finds of hibernating animals were recorded in Lithuania (Vilnius) (Baranauskas et al., 2006), Latvia (Riga) (Suba et al., 2010) and Estonia (Lutsar, Masing, 2011). A lot of *V. murinus* were registered there during the period of fall migration. In addition, mating as well as hibernating animals were recorded in the big cities of Western and Central Poland (Sachanowicz et al., 2006).

In Ukraine singing and hibernating animals have been noticed since 1998 in 14 districts and Autonomous Republic of Crimea. Regular findings have been recorded in Luhansk (Zagorodniuk, Korobchenko, 2008), Kharkiv (Vlaschenko, Gukasova, 2012, pers. com.), Kyiv, Odesa and other cities for a long time (Godlevska, 2013). At the same time, L. Godlevska notes the connection between winter findings of *V. murinus* and the vertical rocks and multistoried buildings.

For the territory of Belarus (Brest) the hibernating of *V. murinus* was registered during the winters 1996–1998 and spring residence — in 1998–2003 (Demianchik et al., 2012). The number of the hibernating specimens is estimated at 1.36 % of the total hibernating bats in Brest. In addition, for Brest “...hibernating have been recorded in different microtopes of the apartments of multistoried buildings” since the beginning of 2000th (Demianchik, 2010).

Methods

Presented data is the result of Minsk bat contact center work in 2007–2016. Usually animals were collected from different places after the appeals of local residents. Hereafter, general examination, species identification and registration of main morphometrical parameters were carried out. Then, according to circumstances, animals either were released or forced into hibernation. In some cases, identification of animals was carried out by the photo materials and, because of that, the detail description was impossible. The specimens, registered from September to April, were considered as the hibernating animals. Mating calls were considered as the proof of hibernation since reproduction of *V. murinus* takes place near the hibernation sites (Strelkov, Abramov, 2001).

Results and discussion

Overview of the findings

Minsk. Contact records: 1 M, 01.11.2007, flew into the air conditioner tube of the office room; 1 M, 28.10.2008, balcony of the 7th floor; 1 M, 30.11.2008, balcony of the 5th floor; 1 M, 17.11.2010, balcony of the 8th floor; 1 M, 13.11.2011, balcony of the 6th floor; 1 F, 27.09.2012, found grounded near a multistoried building; 1 M, 20.10.2012, inside an office room; 1 M, 25.10.2012, found in wood-frame window, 11th floor; 1 F, 26.10.2012, found grounded near a multistoried building; 1 F, 01.11.2012, flew into a window, 11th floor; 1 M, 05.11.2012, details are unknown; 1 M, 12.11.2012, 5th floor; about 30 individuals, 14.11.2012, flew into the window of a multistoried building; 1 M, 23.11.2012, found in wood-frame window, 1st floor of a multistoried building; 1 M, 22.12.2012, multistoried building; 1 M, 04.01.2013, inside a multistoried building; 1 M, 05.01.2013, inside a multistoried building; 1 M, 05.01.2013, balcony of the 9th floor; 1 F, 14.01.2013, inside a multistoried building; 1 F, 20.01.2013, inside a multistoried building; 1 F, 30.01.2013, found between the glasses of a window frame, 4th floor of a multistoried building; 1 F, 31.01.2013, inside a multistoried building; 1 M, 06.03.2013, balcony of the 9th floor; 1 M, 07.03.2013, inside a multistoried building; 1 M, 11.03.2013, details are unknown; 1 M, 11.04.2013, details are unknown; 1 M, 29.11.2013 r., found in wood-frame window, 9th floor of a multistoried building; 1 F, 17.01.2014, balcony of the 10th floor; 1 F, 20.01.2014, found in wood-frame window; 1 M, 30.01.2014, found in wood-frame window, 4th floor; 1 F, 03.02.2014, flew in the stairwell of a multistoried building; 1 F, 03.02.2014, flew in the stairwell of a multistoried building; 1 F 18.04.2014, multistoried building, flew out of the elevator shaft, 3–4 finds before; 1 F 30.10.2014, stairwell, 8th floor of a multistoried building; 1 F 18.11.2014, stairwell of a multistoried building; 1 M 24.11.2014, flew into the apartment on the 10th floor; 1 F 03.12.2014, found in the apartment, multistoried building; 1 M 30.12.2014, multistoried building; 1 F 25.09.2015, balcony of the multistoried building; 1 F 02.10.2015, found grounded near the multistoried building; 1 M 12.10.2015, found grounded near the multistoried building; 1 F 26.10.2015, found on the windowsill, 20th floor; 1 M 07.12.2015, flew into the balcony; 1 F 08.12.2015; 2 F 24.12.2015, colony was found behind the old windows of the plant. Other specimens (about 10) flew; 1 F 11.12.2015, found in the stairwell; 1 F 23.01.2016, found in the stairwell; 1 M 1F 09.02.2016, found in the same stairwell; 1 M 22.02.2016, found in the stairwell, several bats flew.

Photo records: 1?, 23.11.2012, flew into apartment on the 7th floor; 1?, 07.12.2012, balcony of a multistoried building; 1?, 07.10.2013, found grounded; 1?, 28.10.2013, flew into the window of a multistoried building; 1?, 08.11.2013 found in wood-frame window, 6th floor of a multistoried building.

Pastavy. Photo record: 1?, 13.12.2013., flew into the apartments on the 6th floor through the vent hole.

Homiel. Contact record: 1 F, 27.01.2011, flew into the window of a multistoried building (V. V. Gritchik, pers. com).

Description scheme: number of individuals, sex (M — male, F — female, ? — unidentified), date of registration, details.

In total, 57 hibernating individuals of *V. murinus* were recorded, starting from 01.11.2007 to 31.03.2016, of which 55 — in Minsk, 1 — in Pastavy and 1 — in Homiel (fig. 1). There were registered either single animals or small groups. Worth noticing the registration of some groups of animals (about 30 individuals), that flew into the window of a multistoried building in Minsk 14.11.2012. It corresponds to the mention of migrant groups of *V. murinus*, which are registered regularly in Minsk, Brest and Pinsk (Demianchik, 2010). Hibernation or its attempts took place exclusively in anthropogenic roosts, such as balconies, stairwells, elevator shafts etc., located, mainly, in multistoried buildings. Some animals were found on the ground, but, always, in the districts of high-rise buildings. Dynamics of the number of findings and the sex ratio of registered individuals are shown in fig. 2. However, this histogram reflects just finds of individuals, without taking into account the colonies. A significant increasing of the number of hibernating animals in 2012–2013, at the first sight may indicate a relative increase of the hibernating individuals' number in comparison with the previous period 2007–2011. But we suppose, that the main role was played by numerous popular-



Fig. 1. Localities of winter records of *V. murinus* in Belarus.

The map was compiled using publication, mentioned in the text, and our own data.

● — registration's localities; 1 — Mikaševičy; 2 — Narač; 3 — Pastavy.

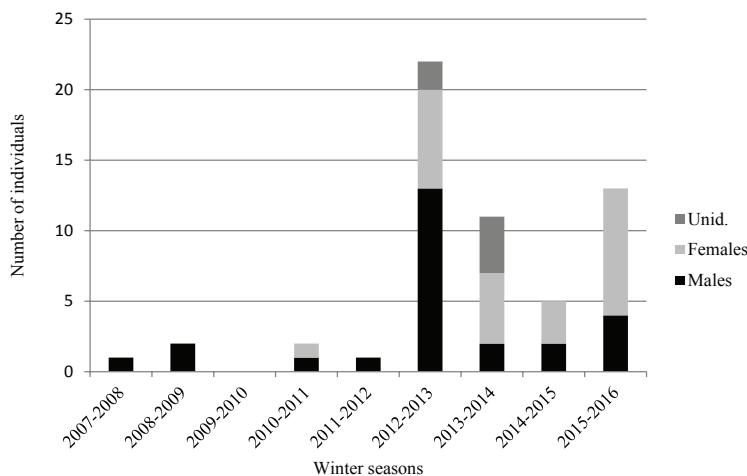


Fig. 2. Number of winter findings of *V. murinus* in Belarus (except colonies).

science activities (lectures, articles, interviews and creating of the web-pages concerning bats of Belarus etc.) that were carried out in 2012 in the context of International Bat Year. As a result, the number of requests to specialists, regarding finds of hibernating animals, has sharply increased. This reason, in our opinion, also explains the prevalence of finds in Minsk, where the majority of these bat-events took place.

Mating songs of *V. murinus* males have been recorded in Minsk regularly in the areas of high-rise buildings. Also they were registered during autumn–winter in Mikaševičy and Narač — towns, where housing development is mainly presented by buildings which are up to 5 floors.

Thus, based on our data, and on the literature sources, we assume that the whole territory of Belarus is included in the hibernation area of *V. murinus*. At the same time, hibernation, or its attempts occur exclusively in urban districts of high-rise buildings. Furthermore, the migrant groups are periodically registered during autumn, but the lack of the banding data does not allow to draw the conclusions about origin and routes of these groups.

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