HIBERNATING BAT SPECIES OF BELARUS: RESULTS OF THE WORK OF THE MINSK BAT CONTACT CENTRE

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Introduction

Bats (Chiroptera) are an order of mammals, which due to the specifics of their biology strongly depend on humans. In particular, bats can use human buildings as temporary or permanent roosts (Voight, 2016). In such case, often there is an animal-human conflict, which usually leads either to the exilement of animals from the roost or to their death (Merzlikin, 2002). However, bats are legally protected in most countries of Europe (Council Directive 92/43/EEC, Bonn and Bern Conventions). In Belarus, particularly, eight bat species are included into the national Red Data Book (2016 ed.).

Solving this problem solely through the popularization and distribution of knowledge about bats is not always possible for a number of reasons. At the best, finding of wintering or maternity colonies during private or department repair and construction works ends with appealing of the people who discovered the colony to a specialized nature protection organization (e.g., Ministry of Natural Resources, City Committee of Natural Resources, State Inspectorate for the Protection of Flora and Fauna), to the Ministry for Emergency Situations, or to NGO “APB-Birdlife Belarus.”
Usually, all reports are redirected to the Academy of Sciences. In any case, animals are expelled from the roosts and, if the situation takes place during hibernation period, they need rehabilitation. Although, firstly, the rehabilitation of bats cannot be provided by the resources of the mentioned organizations and, secondly, it is not among their goals. There is a similar situation, when hibernating bats are found on balconies, in entrances, office rooms, etc., with the only difference that, in this case, occasionally it is possible to leave the animal in the roost without disturbing it.

Obviously, specialized contact and rehabilitation centres for bats, which goals are rehabilitation of animals and popularization work, should deal with such problems. In addition, the indirect result of the work of such centres is the constant accumulation of scientific information and monitoring of the bat fauna (Godlevska, 2012). This is all the more topical because systematic assessment of species composition of wintering bat for the whole territory of Belarus has not been carried out since the 1980s. Thus, the main goal of this work is the refinement of the current species composition of bats, wintering in Belarus, and clarification of some of their ecological features.

**Material and methods**

The data presented here are the result of the work of the Minsk bat contact centre in the period from 2007 to 2017. The activity of the Centre from 2007 to 2012 was rather sporadic, becoming regular only in the following years (2012–2016), when the number of requests for animal finds increased sharply (fig. 1). In our opinion, this is due to the number of educational events in 2012, dedicated to the International Year of Bats and their implementation into regular annual practice with media coverage. In addition, it should be noted that upon detection of animal the source of information on the activity of the Centre is mainly the Internet or the above-mentioned environmental organizations and NGO.

The work of the Centre is mainly to provide information support to people, who have applied upon detection of bats. If the animals could not be left in their original roost (finds on the street, on balconies and in living quarters, during construction works, etc.), bats were accepted by the Centre for rehabilitation and artificial hibernation with subsequent release into the nature. Captured animals were examined for species identification, trauma detection and registration of basic morphometric parameters. In some cases, species identification was done according to the provided photos. All the information received was added to the database with the following sections: species, date, sex, age, length of forearm, weight, place of registration, details, further fate, name of the person applying, his/her phone number, source of information about the Centre, and photo of the animal (if possible). According to the literature data (Kurskov, 1981), all bats found between 1 October and 30 April were considered hibernating. However, there is a possibility that the individuals registered in the beginning of October or second half of April were migrants.

**Results**

In total, from the XIX century to the present day, the hibernation of 12 bat species was registered in Belarus:


Because of the Centre’s activity, the hibernation of 6 bat species was noted, the details of which are given below. Due to the specifics of the Centre’s work, all finds in different settlements (cities, villages etc.) were registered. However, given that there are no natural underground roosts in Belarus and hibernation in tree hollows and similar roosts is impossible due to their freezing in winter (Kuzyakin, 1936), the facts of hibernation of bats in the modern period are registered in anthropogenic roosts with a few exceptions (Kurskov 1981; Demyanchyk, 2001; V. Grichik, pers. comm.).
In total, 113 requests from 16 localities of Belarus were received during the described period (fig. 2). Among them, 5 appeals concerned with finds of bat aggregations and 108 with records of single individuals. All finds are described in the text according to the following scheme: Single individuals and photo registrations: sex (F — female, M — male, ? — unidentified), date (dd.mm.yy), details; Colonies: date, details. Species in the list below are in the order of decreasing the number of registrations.

**Vespertilio murinus**

There are 76 finds (73 single specimens + 3 colonies) from 8 localities, which is 70.3 % of the total number of records.

Asipovičy, single specimens, photo record: sex?, 09.12.2017, found in the mail box.

Barysaŭ, single specimens, photo record: sex?, 05.10.2016, found grounded; sex?, 11.12.2016, found grounded.

Homiel, single specimens, contact record: F, 27.01.2011, flew into the window of a multi-storey building (V. V. Gritchik, pers. com).

Minsk, single specimens, contact records: M, 01.11.2007, flew into the air conditioner tube of an office room; M, 28.10.2008, balcony on the 7th floor; M, 30.11.2008, balcony on the 5th floor; M, 17.11.2010, balcony on the 8th floor; M, 13.11.2011, balcony on the 6th floor; F, 27.09.2012, found grounded near a multi-storey building; M, 20.10.2012, inside an office room; M, 25.10.2012, found in a wood-frame win-
Hibernating bat species of Belarus: results of the work of the Minsk bat contact centre

Hibernation of V. murinus that the whole territory of Belarus belongs to the wintering range of this species. Hibernation of 3 concerned colonies and 73 were single individuals.

...the apparent dominant among our finds (70.3 % of the total number of registrations), of which...
the Centre come from medium-sized or large cities and, therefore, our data may reflect the spe-
cies composition of such habitats;
• possible greater sensitivity of the parti-coloured bat to the winter temperature changes and
anxiety in general, which leads to the fact that it leaves the hibernation roost and attracts peo-
ple’s attention.

**Eptesicus serotinus**

There are 17 finds (17 single specimens) from 5 localities, which is 15.7 % of the total records.

- **Minsk**, single specimens, contact records: F, 15.10.2012, found grounded; F, 18.12.2012, found on the wall outside; F, 28.10.2013, found grounded; F, 03.01.2014, found dead on the wall inside a multi-storey building; M, 27.11.2014, flew into a multi-storey building; M, 19.02.2015, found dead, multi-storey building; F, 01.12.2015, found grounded; M, 05.01.2016, found grounded; M, 09.01.2017, found grounded; M, 24.01.2017, found in the toilet of the Central Botanical Garden; F, 21.02.2017, found under a drainpipe

*Photo records: sex?, 23.12.2013, flew into a cottage;*


- **Slonim**, single specimen, photo record: sex?, 12.03.2017, found on the floor of a garage.

The serotine bat is a sedentary species. The facts of its hibernation in Belarus has been noted
since 1940 (Serzhanin, 1955). The same situation is observed in the whole European part of its
range, where the recorded distance between summer and winter roosts is usually less than 40–50 km (Baagoe, 2001).

**Nyctalus noctula**

There are 12 finds (10 single specimens + 2 colony) from 7 localities, which is 11.1 % of the to-
tal records.


- **Hrodna**, single specimen, contact record: M, 09.01.2017, details are unknown.

*Photo record: sex?, 28.03.2017, flew over the river.*

- **Jastrabiel village (vicinities), Stolin district, Brest region, colony, 25.10.2010, 22 individuals, a hollow
  on a grey alder (*Alnus incana* (L.) Moench, 1794). Two females were caught (V. V. Gritchik, pers. com.).


- **Minsk**, single specimens, contact records: M, 07.12.2012, balcony, multi-storey building; M, 04.04.
  2013, balcony, multi-storey building; F, 30.11.2016, found grounded; F, 05.12.2016, found grounded.

- **Salihorsk**, single specimen, photo record: sex?, 01.03.2017, found grounded. Colony, photo record:
  25.04.2016, more than 30 individuals, under window space. It was also found a lot of faeces and several
  mummified specimens.

- **Žodzina**, single specimens, contact records: M, 21.11.16, found in the stairwell, multi-storey building.

The noctule bat is a widespread species, considered for Belarus as a migrant, and it was con-
firmed by banding data. The terms of the spring arrival extended from the end of April for western
Belarus to the second half of May for the eastern part of the country. Recent data (Godlevska, 2014)
show the expansion of wintering range of *N. noctula* in the northeastern direction since the 1990s.
Until now, this range is expanding in the territory of Poland, Ukraine and southwestern Russia. The
facts of the noctule bat hibernation have been noted for southwestern Belarus since the late 1990s
(Demianchyk, 2001). Our finds allow expanding the boundaries of the wintering range of *N. noctula*
in the northeast direction, thereby confirming the assumptions of L. Godlevska (2014). However,
• permanent hibernation roosts were not found yet,
• mainly, single individuals were registered during hibernation period.

We suppose, that there are just attempts of hibernation take place in Belarus at the present time.
Eptesicus nilssonii

There are 3 finds (3 single specimens) from 3 localities, which is 2.7 % of the total records.

Barauliany, single specimens, photo record: sex?, 13.10.2013, found grounded.
Minsk, single specimens, contact record: M, 08.12.2011, found on the outside windowsill, 5th floor, multi-storey building;
Viciebsk, single specimens, photo record: sex?, 21.01.2014, found on the factory floor.

The northern bat is a rare species of the Belarusian bat fauna and it is included into the Red Data Book of Belarus and has IV category (NT) of the national nature conservation significance. Based on the absence of winter finds, Kurskov (1981) described this species as a migrant. The first registrations of E. nilssonii during hibernation period were noted in Brest in 1996–1997 (Demianchyk, 2001). Our finds of single individuals in three locations in central and northern Belarus make possible to consider this species as wintering.

Plecotus auritus

There are 3 finds (3 single specimens) from 3 localities, which is 2.7 % of the total records.

Cieliachany, Brest region, single specimen, photo record: sex?, 10.02.2015, hibernation, cellar.
Rataječcy village, Kamianec district, Brest region, single specimen, photo record: sex?, 26.01.2014, hibernation, cellar.

This bat is a widespread species, which is sedentary in the whole area of its range. The maximum documented distance of its seasonal movements is 90 km (Hutterer et al., 2005).

Pipistrellus kuhlii

There are 2 finds (2 single specimens) from 2 localities, which is 1.8 % of the total records.

Karma, Homiel region, single specimen, photo record: sex?, 10.11.2015, found during renovation behind a downspout of a five-storey building.
Minsk, single specimens, contact records: M, 30.01.2017, found in the stairwell of a multi-storey building.

In Belarus, the first winter colony of Kuhl’s pipistrelle bat was registered in 2012 (Demianchyk, 2013) in the Brest region and it was the first ever registration of this species. During 2015–2016, there were two finds of single individuals to North and Northeast from the original locality. This limits all information about biology and distribution of P. kuhlii in Belarus. In our previous article (Shpak, Larchanka, 2017), the character of the expansion of this species from the middle of the 1980s to the present time was analysed. It was suggested that the colonization of the territory of Belarus occurred, mainly, from the Eastern centre of the species’ distribution (Azerbaijan) and range expansion will take place in northwest direction along rivers of the Dnieper and Prypiac basins.

Discussion

It should be noted, that there are no finds of Myotis and Barbastella genera. The absence of representatives of the genus Barbastella can be explained by the fact that the border of the wintering range passes through the West of Belarus, where the fortifications of Brest Fortress are the largest hibernation site. We suppose that the absence of representatives of the genus Myotis may be related to their relative rarity: four of the six species registered in Belarus (M. dasycneme, M. nattereri, M. brandtii, M. mystacinus) have a high level of national conservationi significance and are included into the Red Data Book of Belarus (2016). Besides, M. myotis has not been recorded since 1970.

The number of requests related to findings of wintering animals is approximately at the same level from October to January, reaching a slight peak in December and gradually declining from February to April (fig. 3).
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