

New data on the distribution of barbastelle bat (*Barbastella barbastellus*) in Western Hungary

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WINKLER, D., ERDŐ Á, MILLE, J. & KOVÁCS, H.: *New data on the distribution of barbastelle bat (*Barbastella barbastellus*) in Western Hungary.*

Abstract: Acoustic bat surveys have been carried out between end of April and mid-September of 2013 in several Natura 2000 sites of Vas and Somogy counties. As a result occurrences of barbastelle bat (*Barbastella barbastellus*) were detected in 9 out of the 12 surveyed Natura 2000 sites. The species was recorded in various riverine and floodland forest communities, such as ash-alder forests, willow-poplar forests and oak-elm-ash forests, as well, as in lowland pedunculate oak-hornbeam woodlands. A total of 17 new UTM 10x10 km² squares with barbastelle bat occurrence have been added to the 10 formerly known squares in Vas and Somogy counties. The results show a possible expansion of this species in lowland woodland areas, which requires appropriate guidelines for forest management in the affected sites.

Keywords: acoustic bat survey, *Barbastella barbastellus* occurrence, Natura 2000, forest management

Introduction

The barbastelle bat [*Barbastella barbastellus* (Schreber, 1774)] is regarded as one of the rare and strictly protected bat species in Hungary. Distributed throughout Europe, from England, Sweden and Latvia in the north, to the Mediterranean. It is also present on various Mediterranean islands and reaches North Africa in Morocco. The eastern border of the distribution area is located in the Caucasus (URBAŃCZYK 1999, SCHÖBER 2004, DIETZ et al. 2009). The barbastelle bat is protected in the European Union under Annexes II and IV of the Habitats Directive 92/43/EEC.

In Hungary, the species mostly prefers submontane forest habitats, where it is more common in large, continuous old forest stands (SZATYOR 2000, BIHARI 2007). It also occurs, with lower density, in lowland areas (BIHARI 2007, GÖRFÖL & DOMBI 2009), where it also prefers old, close-to-nature forests (GÖRFÖL & ESTÓK 2014).

With technological development bat detectors became widely used in the 21st century. It is now easier and more feasible to define the distribution of a wide range of bat species with recording acoustic communication and hunting calls of bats than any other method. DOMBI (2005) recorded the barbastelle bat in lowland areas along the Dráva River while, after long decades of absence, SZATYOR (2005) newly detected it in the Őrség along the Rába River.

In 2013 acoustic bat surveys have been carried out in several Natura 2000 sites in Western Hungary. This paper presents newly recorded distribution data of the barbastelle bat in Vas and Somogy counties.

Material and methods

Study area

The surveys were carried out in several Natura 2000 sites in Vas and Somogy Counties; Western Hungary, the list of surveyed sites are as follow:

Vas County

Ablánc-patak völgye (1 366.3 ha)
Kenyéri repülőtér (589.0 ha)
Pinka (455.2 ha)
Rába és Csörmöc völgy (11 781.0 ha)

Somogy County

Boronka-melléke (10 643.7 ha)
Dékány-hegy (881.1 ha)
Jánosházi-erdő és Égett-berek (591.2 ha)
Kisbajomi erdők (1 280.6 ha)
Mernyei-erdő (237.4 ha)
Mocsoládi-erdő (2 629.7 ha)
Pati-erdő (349.8 ha)
Törökkoppányi-erdők (2 167.7 ha)

The surveyed area covered a total of 32972.7 hectares.

Survey methods

Bat surveys were carried out three times in 2013, between the end of April and mid-September, roughly following the guidelines by the Agreement on the Conservation of Populations of European Bats (BATTERSBY 2008). In each night the recording started shortly after sunset under good weather conditions with no rain, strong wind or low temperature.

For the acoustic surveys Pettersson D500X detectors (Pettersson Elektronik, Uppsala, Sweden) were used. In each survey sites 1 km long transects in every 500 hectares were determined to cover major habitat types. Point count method was used to survey rivers and streams, setting one point per 5 kilometers. The detector was recording for a total of 20 minutes in each sampling point.

Data analysis

The identification of barbastelle bat from its echolocation call is possible with a highly reasonable confidence. The barbastelle bat typically alternates two call types in a sequence (Fig. 1): a. call with peak frequency at ~32 kHz, start frequency at ~40 kHz and end frequency at ~28; b. a low intensity call with peak frequency at ~42 kHz, start frequency at ~45 kHz and end frequency at 30-35 kHz (DIETZ et al. 2009, RUSS 2012).

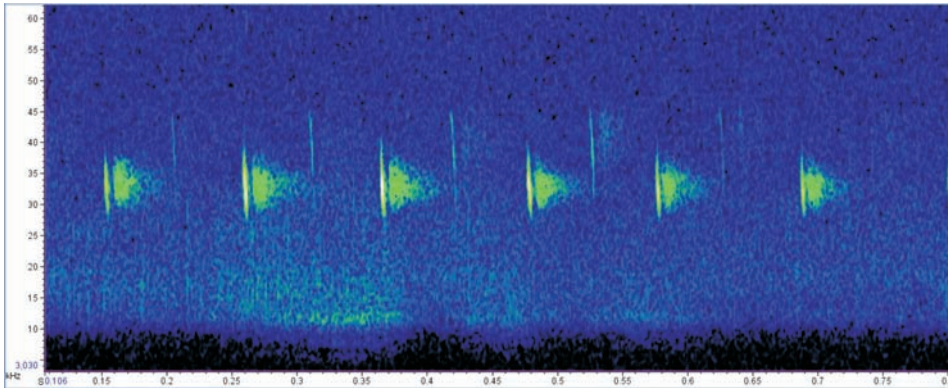


Fig. 1: Typical alternating echolocation call of barbastelle bat (recorded at the Rába River)

The sound files of .wav format recorded with the detector were first edited by using the software Adobe Audition 3.0. The edited files were then analysed with the software SonoBat 3.1.5p by measuring the following key parameters of the echolocation call: frequency of maximum energy; start frequency; end frequency; call duration; inter-pulse intervals, respectively.

Results

During the surveys we detected the presence of the barbastelle bat in 9 out of 12 Natura 2000 sites (Table 1). While recorded only in the spring and autumn period in the site “Rába és Csörnök-völgy”, the species was constantly present, including reproduction period in the summer, in all other sites. barbastelle bats have been detected in various riverine and floodland forest types including ash-alder woodlands, willow-poplar woodlands, oak-elm-ash woodlands, also in lowland pedunculate oak-hornbeam woodlands.

Table 1: Natura 2000 sites with barbastelle bat record data

Natura 2000 site	record date (dd/mm/yyyy)
Ablánc-patak völgye	17/05/2013; 18/06/2013; 22/09/2013
Rába és Csörnök völgy	17/04/2013; 19/09/2013; 28/09/2013
Boronka-melléke	09/05/2013; 28/05/2013; 04/07/2013; 25/07/2013; 15/09/2013; 19/09/2013
Dékány-hegy	07/05/2013; 29/07/2013; 30/08/2013
Égett-berek és Jánosházi erdő	25/04/2013; 30/04/2013; 15/06/2013; 17/06/2013; 19/08/2013; 02/09/2013
Kisbajomi-erdő	23/04/2013; 29/06/2013; 15/08/2013
Mocsoládi-erdő	15/05/2013; 22/07/2013; 27/08/2013
Pati-erdő	22/04/2013; 05/06/2013; 09/08/2013
Törökoppányi-erdő	08/05/2013; 13/07/2013; 18/09/2013

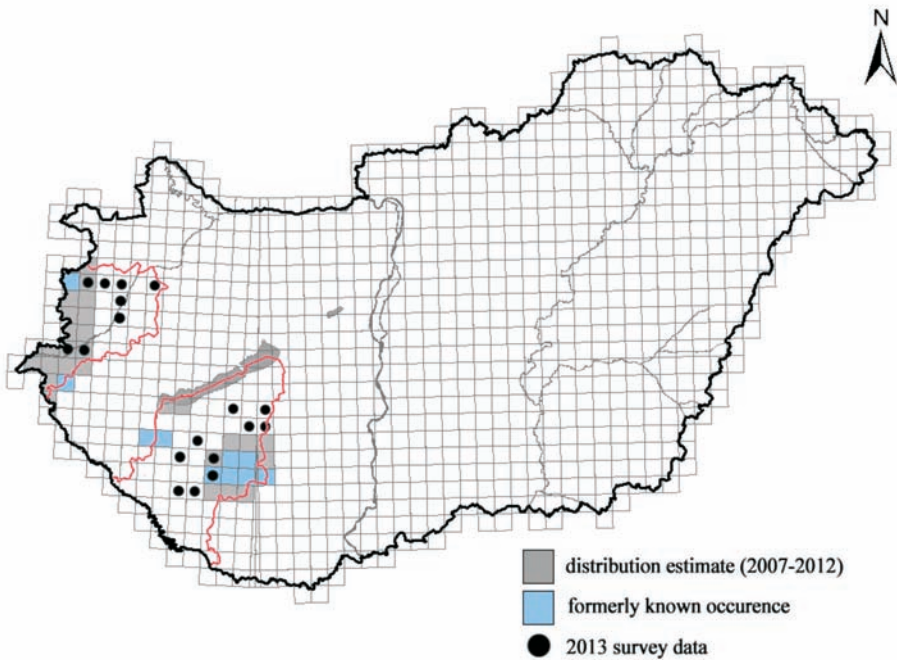


Fig. 2: Estimated distribution (2007-2012) and formerly known occurrences of barbastelle bat in Vas and Somogy Counties (EIONET 2013) and the results of the 2013 surveys

In the counties Vas and Somogy, total number of UTM 10x10 km squares, where barbastelle bat's occurrence has been proved, increased from 10 to 27 (Fig. 2).

Discussion

While mainly considered as a sub-montane species in Hungary (SZATYOR 2000, BIHARI 2007), more and more observations of Barbastelle Bats are reported from lowland areas (DOMBI 2005, SZATYOR 2005, GÖRFÖL & DOMBI 2009). This phenomenon is well reflected in our detector survey results in Vas and Somogy Counties. Although the presence of colonies has not been proved due to the limitations of the method used, the constant detection of the species in most survey sites strengthen the probability of reproduction. The availability of suitable habitats is generally adequate, since both riverine woodlands and lowland pedunculate oak-hornbeam woodlands could offer sufficient food source (e.g. moths) and roosting possibilities. Since loose bark is considered as the most important roost type for this species (RUSSO et al. 2004, GÖRFÖL & DOMBI 2009), the presence of standing dead trees in these forests is crucial for the barbastelle bat. The new occurrences underline also the necessity to determine appropriate guidelines for woodland management in the affected sites, which include elimination of clear-cuts, preservation of dead and mature trees; reforestation with native tree species only and clearing of invasive tree species, such as *Fraxinus pennsylvanica* and *Acer negundo* in the riverine forests.

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