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RECORD OF BRANDT'S BAT *MYOTIS BRANDTII* (EVERSMANN, 1845) IN PIEDMONT (CHIROPTERA, VESPERTILIONIDAE)

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RIASSUNTO – ***Ritrovamento del Vespertilio di Brandt* Myotis brandtii *(Eversmann, 1845) in Piemonte (Chiroptera, Vespertilionidae)***. Viene riportata la cattura con *mist-net* di 5 maschi adulti di Vespertilio di Brandt *Myotis brandtii*, nell'agosto 2005, nei pressi dell'abitato di Devero (Baceno, VB), a 1827 metri d'altitudine, nel Parco Naturale Alpe Veglia e Alpe Devero. Tale dato rappresenta la prima segnalazione certa della specie in Piemonte. L'identificazione è stata effettuata sulla base delle caratteristiche dentarie e del pene. Sono fornite indicazioni sulle caratteristiche dei segnali di ecolocalizzazione ottenuti dopo il rilascio degli individui.

Parole chiave: Chirotteri, *Myotis brandtii*, prima segnalazione, Regione Piemonte, Italia nord-occidentale

Brandt's bat *Myotis brandtii* (Eversmann, 1845) is a small Eurasian bat belonging to the Vespertilionidae (Lanza and Agnelli, 1999), distributed across southern Scandinavia, England, eastern France, Switzerland and Italy (Gerrell, 1999).

The first reliable record of its presence in Italy (Monte Amiata, Tuscany) was reported by Lanza (1959); reports tend to be rather patchy because of the difficulty in taxonomic determination, due to its similarity to *Myotis mystacinus*. There have been recent reports of the species in the Abruzzo National Park and in the province of Bolzano (Issartel, 2001; Niederfriniger, 2001).

As far as Piedmont is concerned, there is only one record, from Pinerolo, province of Turin (Sindaco *et al*., 1992), of a bat classified as *brandtii* according to Lanza (1959) through the size of the forearm and the condylo-basal length. This individual was never subsequently checked and historic reports of the species for Piedmont remain doubtful (Lanza and Agnelli, 1999; P. Agnelli and E. Patriarca, *com. pers*.).

A study of Chiroptera was conducted in the Alpe Veglia and Alpe Devero Natural Park (province of Verbano-Cusio-Ossola), in the summers of 2003 to 2005. Three capture sessions (3rd, 4th and 16th of August 2005) took place on a peat bog of about 400 m^2 within a mature larch *Larix decidua* wood, at an elevation of 1,827 m, not far from Devero village (Baceno, VB).

Two mist nets were used, one 12 m x 2.5 m the other 6 m x 2.5 m, both with

Table 1 - Measures of *Myotis brandtii* and *Myotis mystacinus* adult males caught in August 2005 at Alpe Devero (Baceno, VB).

Species	Date	Forearm (mm)	Fifth digit (mm)	Weight (g)
Myotis brandtii	03.08.05	35.1	44	5.0
	04.08.05	36.2	44	7.0
	04.08.05	36.5	43	6.0
	04.08.05	35.9	44	6.0
	16.08.05	36.2	42	6.5
Myotis mystacinus	04.08.05	34.6	42	5.5
	04.08.05	34.9	43	5.5

19 mm mesh and 5 pockets. They were placed across a pool of water and left open from 8.30 to 11.30 p.m. approximately. Overall five *Myotis brandtii* were caught (Tab. 1), together with several specimens of *Myotis mystacinus, Myotis nattereri, Pipistrellus pipistrellus, Hypsugo savii and Nyctalus leisleri*.

Based on the ossification of the joints of the metarcarpal phalanges, all bats were determined as adult males (Antony, 1988). The characteristics used for identification were those relating to dental features and penis morphology as suggested by Baagoe (1973), Tupinier and Aellen (1977), Yalden (1985), Schober and Grimmberger (1997) and Dietz and von Helversen (2004).

The bats caught had golden brown fur on their dorsal sides and lighter coloured undersides, with bare pinkish patches around the eyes and the base of the tragus.

Teeth were examined with a 10x magnifying illuminated glass which made it possible to judge their size. The second lower premolar was the same height as the first lower premolar and the anterior inner cusp of the third upper premolar the same height as the second upper premolar. These characteristics were clearly visible in all cases, with minor variations. For all of these bats the characteristic club shaped penis was evident, an easily visible diagnostic element for distinguishing *M. brandtii* from *M. mystacinus*.

According to Dietz and von Helversen (2004) size, dentition and penis shape allowed us to exclude two other species of the *M. mystacinus/brandtii* group: *M. alcathoe* and *M. aurascens*. There is no report of the former in Italy, but it has been observed in France (Ruedi *et al*., 2002). It is a small bat, its forearm length ranging between 30.8 mm and 33.3 mm, showing morphological characteristics similar to *M. mystacinus*. The latter is considered a separate species by Benda and Tsytsulina (2000), although this hypothesis is not supported by genetic analysis (Mayer and von Helversen, 2001). It has been reported in Italy on Monte Baldo (Trento); the colour of its

fur is similar to that of *M. brandtii,* but its teeth and penis shape are closer to those of *M. mystacinus* (Dietz and von Helversen, 2004).

For comparison we have described the two adult male *M. mystacinus* also captured in the same place. These had dark grey dorsal fur, lighter underside, ears, tragus and bare parts of the snout a blackish colour. The anterior inner cusp of the third upper premolar was smaller than the second upper premolar and the second lower premolar was lower than the first. They had a thin long penis without the characteristic bulbous end found in *M. brandtii*.

After measurements had been taken the five *M. brandtii* were released, recording on minidisc SONY MZ D710 their echolocation calls (Fig. 1) by means of a bat detector D240x using time expansion. Their signals were later processed using BatSound pro 3.31 software, sampling rate of 44100 (16 bit) and 512 pt. FFT with a Hamming window for analysis. For each sequence, equivalent to 34 seconds recording for each individual, two signals were chosen at random and their start frequency, end frequency, frequency of maximum energy, call length and interval between the two calls were measured.

The average values of the analysed parameters (Tab. 2) are comparable with those of *M. mystacinus* (Parson and Jones, 2000; Russo and Jones, 2002, Obrist *et al*., 2004) apart from the end frequency of the call, which appears higher than that reported by Russo and Jones (2002) and Obrist *et al*. (2004), for *M. mystacinus,* and

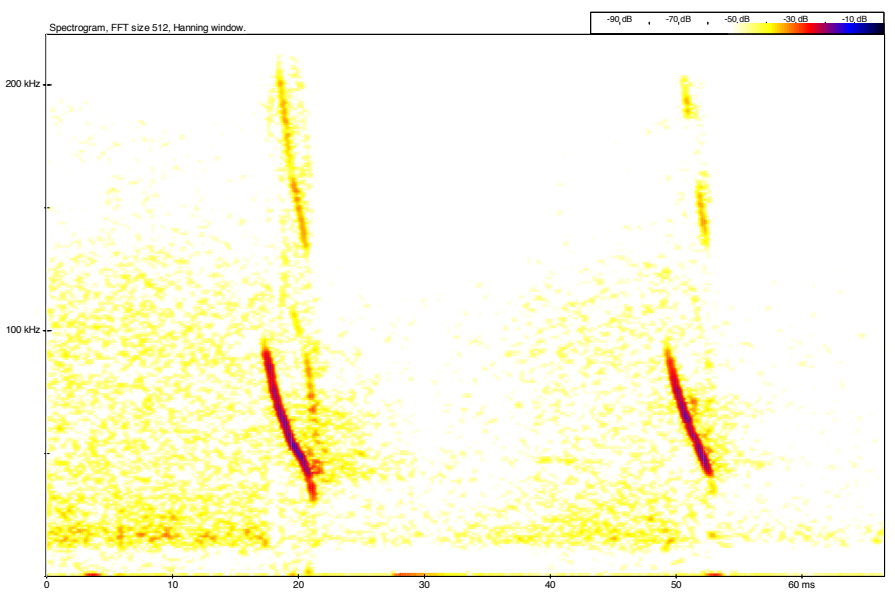

Figure 1 - Spectrogram of echolocation calls of *Myotis mystacinus* (left) and *Myotis brandtii* (right) (Devero, 4th August 2005).

Table 2 - Characteristics of the echolocation calls of *Myotis brandtii* (N = 5) after release.

	Start frequency (kHz)	End frequency (kHz)	Max. energy frequency (kHz)	Call length (ms)	Interval between two calls (ms)
Average	99.8	38.6	61.3	3.0	41.4
SD	1.0	2.4	4.0	1.3	14.0
Min-max	99.5 – 101.0	35.2 – 40.9	46.4 – 65.2	1.3 – 4.4	26.7 – 57.7

by Parson and Jones (2000) and Obrist *et al*. (2004) for the same *Myotis brandtii*. However, the small sample size makes sound conclusions impossible, although Barataud (*pers com*.) states that *M. brandtii* can be distinguished from *M. mystacinus* through its echolocation call, which presents a high end frequency (average 35 kHz) emitted at intervals between 30 and 60 ms, with a characteristic "smack" at the end.

These reports increase the scarce data regarding the presence in Italy of *M. brandtii*, whose numbers, at least in the Alps, are probably higher than what is at present recognised. This species is known to be present in the Canton Ticino of the Swiss Alps, where it has been reported between 1170 m and 1530 m a.s.l. (Moretti *et al*, 2003) and in the Vallese (Hausser, 1995) in areas not far from where it was observed in the province of Verbano-Cusio-Ossola. In the French Alps it is found in Haute Savoie and in Vercors (CORA, 2002) and in the alpine départements of Provençe - Côte d'Azur (M. Barataud and M. Cosson, *com. pers*.).

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