

Occurrence of Bechstein's bat *Myotis bechsteinii* (Chiroptera: Vespertilionidae) in Sicily

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Abstract. The bat fauna of Sicily is still poorly known and no extensive survey of these mammals on the island has been so far carried out. Here we report on the occurrence of Bechstein's bat (*Myotis bechsteinii*) on the island. We recorded this species' presence at two sites of the Nebrodi mountains (central Sicily) at an elevation of ca. 1500 m a.s.l. The occurrence of *M. bechsteinii* in Sicily has been regarded as doubtful and not mentioned in recent checklists. Our observations clearly establish that this species does occur on the island and awaits appropriate consideration for conservation actions.

Keywords: Chiroptera, *Myotis bechsteinii*, Sicily.

INTRODUCTION

The occurrence and distribution of bats in Sicily is still largely unknown. A recent review (Agnelli et al., 2008) reports 20 bat species for the island, some of which only known from old, unconfirmed records. The least known bats are those occurring in forests. Such species, roosting and often foraging in forests, are mostly very elusive, difficult to observe and in some cases not confidently identified from their echolocation calls (Russo et al., 2004), so that their presence is likely to be overlooked.

The Nebrodi Mountains are home to large forest areas, including old growth stands. Although no extensive survey of the bat fauna of this area (as for the rest of Sicily) has been so far carried out (Agnelli et al., 2008), nine species are known for the territory of the Nebrodi Regional Park (Zava et al., 1986; Zava & Lo Valvo, 1991; Zava & Violani, 1992; Vergari et al., 1998; Agnelli et al., 2008; Salicini et al., 2011). This number is certainly underestimated given the range of well preserved habitats available there, clearly providing ecological opportunities to many more bat species.

In this short communication we report on the occurrence of Bechstein's bat *Myotis bechsteinii* (Kuhl, 1817) in Sicily, which we found in the Nebrodi Mountains. This bat is uncommon throughout the Italian territory (Vergari et al., 1998; Agnelli et al., 2004) yet its rarity may at least in part result from the difficulty in detecting or recognizing it. This species occurs in Italy as well as in much of Europe at low population densities and its range is highly fragmented, so that it is listed as an Annex II species under the 92/43/CE Habitats Directive. According to the latter, Special Conservation Areas (SAC) should be designated to protect this

bat. The loss or alteration of old-growth forests, where *M. bechsteinii* mainly roosts, represents a chief threat to its survival. *M. bechsteinii* often roosts in tree holes, especially those made by woodpeckers (Dietz & Pir, 2009). Land use change and intensive forestry causing the loss of suitable roost trees are endangering *M. bechsteinii* as well as other bat species showing similar roosting habits.

MATERIALS AND METHODS

The Nebrodi Mountains lie in NE Sicily, reaching an elevation of 1847 m a.s.l. (Mt Soro), and encompass a wide range of habitats. The forests found at higher altitudes are mostly made of beech (*Fagus sylvatica*) and turkey oaks (*Quercus cerris*); woodlands of European yews (*Taxus baccata*) and wetlands (lakes Maulazzo and Biviere) are also represented in some areas. The study sites where we observed *M. bechsteinii* were located at ca. 1500 m a.s.l in the territory of Longi (Messina province district).

We caught bats at two drinking sites by erecting two 6m mistnets (mesh size = 32 mm). The nets were erected ca. 30 min before sunset and captured bats promptly extracted from them, processed and released. Bats were identified following Dietz and Helversen (2004). Sex, age class and reproductive condition were assessed following Anthony (1988) and Racey (1988).

RESULTS AND DISCUSSION

We caught two *M. bechsteinii* specimens (Figure 1), one at each capture site, two females (one lactating, the other non-breeding). Forearm lengths were respectively 37.7 mm and 39.3 mm and body mass 6.3 and 6.4 g.

In their extensive review on the distribution of *M. bechsteinii* in Italy, Vergari et al. (1998) regarded the presence of this bat in Sicily as uncertain based on the available knowl-



Fig.1 – One of the *Myotis bechsteinii* specimens caught in the Messina province district, Sicily (photo courtesy of G. Mastrilli).

edge. In fact, as Vergari et al. (1998) highlight, although Kahamann & Goerner (1956) mentioned the species' presence on the island, they provided no precise geographic reference; Brink (1957) expressed his doubts about the occurrence of this bat in Sicily, yet later (Brink, 1967) he reported it for NE Sicily. Both Corbet (1987) and Lanza and Finotello (1985) excluded that *M. bechsteinii* occurs in Sicily and consequently the species is absent in the most recent bat checklist for the region (Agnelli et al. 2008). For the sake of completeness we also mention that Zava and Violani (1992) recorded *M. bechsteinii* for the Siracusa province based on an observation carried out with a heterodyne bat detector. Because *M. bechsteinii* cannot be confidently identified from its echolocation calls and given the unreliability of heterodyne identification of *Myotis* bats (e.g. Russo and Jones 2002) unfortunately this record cannot be taken into account.

Our records are thus particularly important because they address a very controversial issue and prove that this bat occurs in Sicily and reproduces there. Further work will have to define the species' range on the island, assess its conservation status and recognize priority areas to be adequately preserved to protect this bat.

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RIASSUNTO

Il Vespertilio di Bechstein *Myotis bechsteinii* (Chiroptera: Vespertilionidae) in Sicilia

La chiroterofauna presente in Sicilia è ancora poco conosciuta e non vi sono studi approfonditi per tutto il territorio. In questo lavoro riportiamo la prima segnalazione certa del Vespertilio di Bechstein (*Myotis bechsteinii*) in Sicilia, ritrovato in due siti sui Monti Nebrodi ad una quota di 1500 m s.l.m. Durante la ricerca sono stati rilevati due esemplari femmina di *M. bechsteinii* in due siti del comune di Longi (Me). Fino ad oggi la presenza di *M. bechsteinii* in Sicilia era stata considerata dubbia e nelle più recenti checklist della chiroterofauna siciliana la specie non è menzionata. Nell'ambito di un quadro di notevole confusione, la nostra segnalazione chiarisce definitivamente che la specie ricorre sul territorio siciliano.

REFERENCES

- Agnelli, P., Martinoli, A., Petriarca, E., Russo, D., Scaravelli, D., Genovesi, P. (2004). Linee guida per il monitoraggio dei Chiroterteri: indicazioni metodologiche per lo studio e la conservazione dei pipistrelli in Italia. Istituto Nazionale per la Fauna Selvatica "Alessandro Ghigi", Ministero dell'Ambiente e della Tutela del Territorio. Quaderni di Conservazione della Natura n° 19.
- Agnelli, P., Di Salvo, I., Russo, D., Sarà, M. (2008). Chiroterofauna della Sicilia. In AA.VV. Atlante della Biodiversità della Sicilia: Vertebrati terrestri. Studi e Ricerche, 6. Palermo: Arpa Sicilia.
- Anthon, E. L. P. (1988). Age determination in bats: In: Kunz, T. H. (Ed.), Ecological and Behavioral Methods for the Study of Bats. Smithsonian Institution Press, Washington D. C. and London: 47-58.
- Brink (Van Den), E. H. (1957). Die Säugetiere Europas westlich des 30. Langengrades. P. Parey, Hamburg, Berlin.
- Brink (Van Den), F.H. (1967). Guide des mammifères sauvages de l'Europe occidentale. Delachaux et Niestlé, Neuchatel.
- Corbet, G.B. (1978). The Mammals of the Palaearctic region. A taxonomic review. A taxonomic review. British Museum (Natural History) Cornell Univ. Press., London and Ithaca.

- Dietz, C. & Helversen (von), O. (2004). Illustrated identification key to the bats of Europe - Electronic publication, Version 1.0.
- Dietz, M. & Pir, J. B. (2009). Distribution and habitat selection of *Myotis bechsteinii* in Luxembourg: implications for forest management and conservation. *Folia Zoologica* **58** (3): 327-340.
- Kahmann, H. & Goerner, P. (1956). Les Chiroptères de Corse. *Mammalia* **20**: 333-389.
- Lanza, B. & Finotello, P.L. (1985). Biogeografia dei Chiroterri italiani. *Boll. Mus. reg. Sci. nat. Torino* **3**: 389-420.
- Racey, P. A. (1988). Reproductive assessment in bats. In: Kunz, T.H., (Ed.). *Ecological and behavioral methods for the study of bats*. Smithsonian Institution Press, Washington D. C. and London: 31-45.
- Russo, D. & Jones, G. (2002). Identification of twenty-two bat species (Mammalia: Chiroptera) from Italy by analysis of time-expanded recordings of echolocation calls. *Journal of Zoology* **258**: 91-103.
- Russo, D., Cistrone, L., Jones, G., Mazzoleni, S. (2004). Roost selection by barbastelle bats (*Barbastella barbastellus*, Chiroptera: Vespertilionidae) in beech woodlands of central Italy: consequences for conservation. *Biological Conservation* **117**: 73-81.
- Salicini, I., Ibanez, C., Juste, J. (2011). Multilocus phylogeny and species delimitation within the Natterer's bat species complex in the Western Palearctic. *Molecular Phylogenetics and Evolution* **61**: 888-898.
- Vergari, S., Dondini, G., Ruggieri, A. (1998). On the distribution of *Myotis bechsteinii* (Kuhl, 1817) in Italy (Chiroptera: Vespertilionidae). *Hystrix (n.s.)* **10** (2): 49-56.
- Zava, B., Corrao, A., Catalano, E. (1986). Chiroterri cavernicoli di Sicilia. *Atti del IX° Congreso Internacional de Espeleologia, Barcelona*, vol. II: 187-189.
- Zava, B. & Lo Valvo, F. (1991). Distribuzione e metodiche di censimento del Molosso del Cestoni (Chiroptera - Molossidae) in Sicilia. *Atti II Seminario Italiano Censimenti Faunistici dei Vertebrati*. Brescia 6-9 aprile 1989. *Suppl. Ricerche Biologia Selvaggina* **16**: 647-649.
- Zava, B. & Violani, C. (1992). Nuovi dati sulla chiroterrofauna italiana. *Boll. Mus. reg. Sci. nat., Torino*, **10** (2): 261-264.