

First record of Daubenton's bat *Myotis daubentonii* (Kuhl, 1817), for the Balearic Islands (Spain)

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During a bat diversity survey in the s'Albufera des Grau Natural Park, nordest Minorca (Balearic Islands) and carried out in summer 2008, a total of 11 different species were identified in the area. In this survey, we captured for the first time Daubenton's bat (*Myotis daubentonii*), being this the first record of this species not only for Minorca Island but also for the Balearic Archipelago. In fact, a total of 15 individuals (11 males and 4 females) of *M. daubentonii* were either mist-netted or hand-netted during the survey indicating the presence of a permanent population of this species on the island, and being Daubenton's bat together with *M. emarginatus* the only two bats found only in Minorca Island. This finding raises interesting questions about the colonization route followed by the species and indicates the importance of carrying out this type of surveys in order to achieve accurate estimates of the Balearic biodiversity and in order to establish appropriate conservation policies.

Keywords: bats, Chiroptera, Minorca, Balearic Islands, *Myotis daubentonii*.

PRIMERA CITA DE *Myotis daubentonii* (KUHLE, 1817), PER A LES ILLES BALEARS. Durant l'inventari de les ratapinyades del parc natural de s'Albufera des Grau, al nord-est de Menorca (Illes Balears), i portat a terme a agost i setembre de 2008, s'han reconegut 11 espècies de ratapinyades. Durant l'esmentat inventari s'ha capturat, per primera vegada per a l'arxipèlag balear, la ratapinyada d'aigua (*Myotis daubentonii*). De fet, la captura d'11 mascles i 4 femelles d'aquesta espècie indiquen la presència d'una població estable de *M. daubentonii* a l'illa de Menorca, sent aquesta ratapinyada, junt a *Myotis emarginatus*, les dues úniques espècies exclusives d'aquesta illa. Aquesta troballa obri interessants qüestions sobre les rutes de colonització i origen d'aquesta població i recolza la realització d'aquest tipus d'inventaris per determinar la biodiversitat real de les Illes Balears i poder, així, establir polítiques de conservació adients.

Paraules clau: ratapinyades, Quiròpters, Menorca, Balears, *Myotis daubentonii*.

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Introduction

The Balearic archipelago located in the Western Mediterranean is made up by four

main islands: Majorca, Minorca, Ibiza and Formentera in addition to several islets nearby. Minorca (40°00'N-04°05'E) is the second largest island (694 km²) and is only

36 km apart from Majorca and 199 km from the closest mainland point of the Spanish coast.

The bat fauna of this archipelago is quite diverse and a total of 19 species have been cited for any of these islands so far. Somehow surprisingly, the check-list of the Balearics is still open since collecting efforts have been traditionally focused basically on cave-dweller bats and there are still several habitats that have not been sampled properly; particularly stand out for their importance the evergreen oak and pine forests and/or the shore marshes which have been traditionally neglected. In fact, a new species was added to the bat community of the Balearics with the discovery of *Pipistrellus nathusii* in one of these marshes areas in Majorca only last year (Trujillo & García, in press). No endemisms have been found so far in bats and all species seem to be evolutionary close to the mainland, although to reconstruct and full understand the past history of these mammals a molecular revision of the Balearic bats is hardly needed. Only 14 bat species have been reported so far in Minorca Island: *Rhinolophus ferrumequinum*, *Rh. hipposideros*, *Myotis emarginatus*, *M. escalerai*, *M. capaccinii*, *Pipistrellus pipistrellus*, *P. pygmaeus*, *P. kuhlii*, *Hypsugo savii*, *Nyctalus leisleri*, *Eptesicus serotinus*, *Plecotus austriacus*, *Miniopterus schreibersii* and *Tadarida teniotis* (Alcover & Muntaner, 1986; Quetglas, 1997; Serra-Cobo *et al.*, 2006). Consequently, there are five missing species in Minorca in relation to other Balearics islands: *Rhinolophus mehelyi*, *Barbastella barbastellus*, *Myotis myotis*, *Pipistrellus nathusii* and *Nyctalus lasiopterus* (Alcover & Muntaner, 1986; Quetglas, 1997; Serra-Cobo *et al.*, 2006; Trujillo & García, 2008), accepting as valid the presence of *Nyctalus lasiopterus* in

Majorca which citation is based only on some echolocation calls listened in Majorca and which were attributed to this species (Serra-Cobo *et al.*, 2006). Nevertheless, the species has never been seen or caught. In this note we report the capture of *Myotis daubentonii*, a new species for this Mediterranean archipelago, found so far only on Minorca Island.

Material and methods

In August and September 2008, a total of 11 different bat species were either captured or detected in the 'S'Albufera des Grau Natural Park' (northeast Minorca) by the first two authors and in the frame of an inventory of its vertebrates fauna (Fig. 1). This protected area consists mainly in a region of brackish waters surrounded by Mediterranean maquia dominated by mastic trees (*Pistacia lentiscus*), evergreen oaks (*Quercus ilex*), and overall, by wild olive trees (*Olea europaea*) with associated Mauritania grass (*Ampelodesmos mauritanica*).

For our bats' survey we applied different complementary methods as recommended by different authors (Ahiartza, 2004; Flaquer *et al.*, 2007). Namely, we used mist-nets of different length (3-18 m), a harp-trap set in the open across water surfaces and inside forested areas and finally hand-nets that were used to capture bats in natural cavities and buildings as they were resting at night. Apart from these, three bat-detectors (*Pettersson Elektronik AB*, D230, D240 and D240x models) were used to monitor bat activity in the trapping localities. Captured bats were all measured with calliper (accuracy 0.01 mm), weighed (accuracy 0.1 g) and some phenological characters recorded (e.g. reproduction, dentition, moult, etc) in the field before

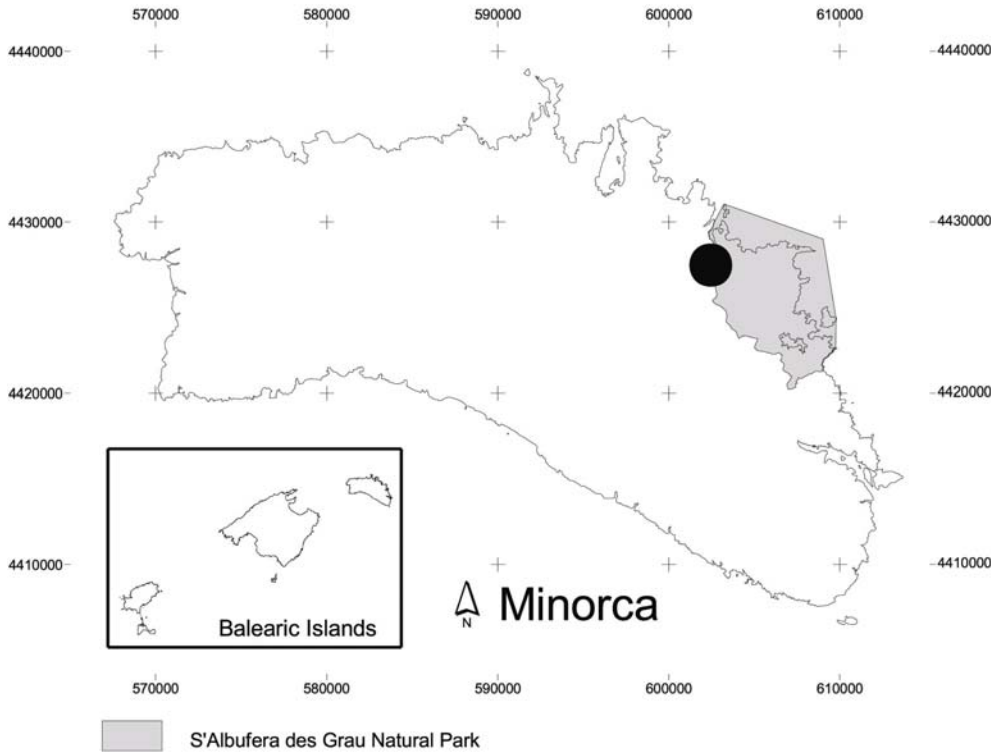


Fig. 1. Capture locality in Minorca of Daubenton's bat (*Myotis daubentonii*). First locality for the Balearic archipelago.

Fig. 1. Localitat de captura en Menorca de la ratapinyada d'aigua (*Myotis daubentonii*). Primera localitat per a l'arxipèlag balear.

being released in the. Wing-punches were also taken from several individuals for future molecular studies.

Results and discussion

Several small *Myotis* bats were caught during our field work in mid August and September. The first being a small sub-adult male hand-netted while he was resting pending from the ceiling of an abandoned small house. The next day, a group of similar bats consisting in six males and at

least one female was spot inside two cracks in the roof of a natural cavity. All bats by one were mist-netted inside the cavity and three additional ones (one male and two females) were netted as they were trying to get in from outside. Finally, another bat was caught with a hand-net inside the cavity. In September 21 seven additional specimens were captured in the same cavity (three of them consisted in recaptures of bats netted in the previous visit). All these small mouse-eared bats were dorsally dark greyish with contrasting whitish bellies (Fig. 2) and were clearly distinct from



Fig. 2. Daubenton's bat (*Myotis daubentonii*) captured in s'Albufera des Grau Natural Park (Minorca Island) in August 14, 2008 (Photo by D. Trujillo).

Fig. 2. *Ratapinyada d'aigua (Myotis daubentonii) capturada al Parc Natural de s'Albufera des Grau (illa de Menorca) el 14 d'agost de 2008 (foto de D. Trujillo).*

any of the three small *Myotis* known in Minorca Island. In fact, they lacked the hairy fringe in the uropatagium typical of *M. escaleari*; the clear notch in the outer edge of the ears typically found in *M. emarginatus*. Finally, they were differentiated from the close *M. capaccinii* because of their general smaller size, naked upper caudal membrane (hairy in *M. capaccinii*) and their very different colour both in dorsal and ventral fur (dorsally greyish in *M. capaccinii*). Forearm measurements averaged 36.7 mm (N = 11, range = 35.63 – 38.05) for males and 37.03 mm (N = 4, range = 35.47-38.21) for females respectively (Table 1). Similarly, average weights were 7.0 g (N = 9, range = 5.4-8.85) for males and 7.77 g (N = 4, range

= 7.0- 8.55) for females respectively (Table 1). External characters and measurements fit with the species *Myotis daubentonii* (Schober & Grimmberger, 1996; Dietz *et al.*, 2007), confirming the presence of a stable population of this species in Minorca Island.

The cavity where the *M. daubentonii* were captured was also used probably as nocturnal roost by *Rhinolophus hipposideros*, *Myotis capaccinii*, *Pipistrellus pipistrellus*, *Eptesicus serotinus* and *Plecotus austriacus*. Besides, the same building where the single male was captured was also used as nocturnal resting spot by several individuals of *Rhinolophus ferrumequinum* and to roost by a colony of *P. pipistrellus*. Both localities were only 6.5

Males		Females	
Forearm	Weight	Forearm	Weight
37.61	6.8	37.37	7.15
36.58	6.25	35.47	7.0
35.84	6.9	38.21	8.55
35.80	6.4	37.07	8.35
37.38	6.5	–	–
38.05	–	–	–
35.63	–	–	–
37.63	8.85	–	–
37.03	7.85	–	–
36.70	8.1	–	–
35.85	5.4	–	–

Table 1. Forearm measurements and weights (in mm and g respectively) of the 15 specimens of *Myotis daubentonii* captured in s'Albufera des Grau Natural Park in Minorca Island.

Taula 1. Les mesures de l'avantbraç i els pesos (en mil·límetres i grams, respectivament) dels 15 exemplars de *Myotis daubentonii* capturats al Parc Natural de s'Albufera des Grau, a l'illa de Menorca.

km apart in straight line and were not far from the most important swampy areas and marshes of the island (Addaida and s'Albufera des Grau salty flats) which are most probably used as foraging areas by the species.

The Daubenton's bat, *Myotis daubentonii*, is a Palearctic species widely distributed across most of Europe, and extending from Central Scandinavia to the south of the Iberian Peninsula, including some of the largest islands in the Mediterranean Sea such as Corsica or Sardinia (Mitchell-Jones *et al.*, 1999; Dietz *et al.*, 2007). In the Iberian Peninsula is found across all regions although always in their specific habitats, being more abundant in the Northern half (Ibáñez, 1998). *Myotis*

daubentonii is in fact, consistently associated to water surfaces (streams, ponds, lakes, etc.) and it shelters in a variety of roosts from bridges or buildings to crevices in rocks (Warren *et al.*, 2000).

The Daubenton's bat seems to show a remarkable uniformity across its distribution and already Corbet (1978) synonymized under the nominal form all previously described subspecies. Nevertheless, Tupinier (1977) described a new form as *M. nathalinae* from Central Spain (Ciudad Real) distinguished by morphological characters (smaller size and darker pelage). This form seems to represent a proper evolutionary lineage according to a recent study based on mitochondrial DNA (Simões *et al.* 2007).

To which lineage the Daubenton's bat of Minorca belongs to is still an open pending of a molecular checking.

The presence of *M. daubentonii* in the island of Minorca may have stayed overlooked to other researchers due to the fact that most of previous works were focused on cave-dweller bats (Alcover & Muntaner, 1986; Quetglas, 1997; Serra-Cobo *et al.*, 2006) and the swampy areas used by this species were probably not surveyed properly since are not particularly rich in this type of refuges.

On the other hand, the finding of Daubenton's bats in Minorca brings out interesting questions about the origin of this island population and opens the possibility of this bat being also present in other islands of the archipelago, like Majorca, larger and closer to the mainland than Minorca. In Majorca only the similar *M. capaccini* has been found so far. Nevertheless, in the area of s'Albufera de Alcedia several short and sharp echolocation calls with a maximum energy frequency between 41-55 kHz were recorded by the first two authors over a water surface that could belong to *M. daubentonii*. Nevertheless, both bats show similar echolocation calls, overlapping most of their sound variables (Boonman *et al.*, 2008). In fact, only the study at hand of captured bats can demonstrate without doubts their presence on any place and particularly on the islands of the Balearic archipelago. This point is particularly critical in the case of species like *M. daubentonii* or *Nyctalus lasiopterus* that have similar echolocating calls than other bats from which they are difficult to tell apart using only this character.

Finally, the finding of two new mammals for the Balearic Archipelago only in the last two years, stresses the importance and necessity of carrying out this type of

surveys over all different habitats (particularly protected areas) on all the islands that make up this unique archipelago in order to achieve a comprehensive assessment and valuation of its biodiversity.

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References

- Aihartza, J. R. 2004. *Quiròpteros de Araba, Bizkaia y Gipuzkoa: Distribución, Ecología y Conservación*. Serie tesis doctorales. Servicio Editorial de la Universidad del País Vasco. 346 pp.
- Alcover, J. A. & Muntaner, J. 1986. Els quiròpters de les Balears i Pitiüses: una revisió. *Endins*, 12: 51-63.
- Boonman, A., Dietz, C., Koselj, K., Runkel, V., Russo, D. & Siemers, B. 2008. *Identification of European bat species by their echolocation calls*. - electronic publication: <http://www.batecho.eu>
- Corbet, G. B. 1978. *The mammals of the Palaearctic region: a taxonomic review*. British Museum (NH), London, 314 pp.
- Dietz, C., Helversen, O. & Nill, D. 2007. *Handbuch der Fledermäuse Europas und Nordwestafrikas. Biologie, Kennzeichen, Gefährdung*. Kosmos naturführer. Stuttgart. 399 pp.
- Flaquer, C., Torre, I. & Arrizabalaga, T. 2007. Comparision of sampling methods for inventory of bats communities. *Journal of Mammalogy*, 88 (2):526-533.
- Ibáñez, C. 1998. Los Quiròpteros. 114-218. *In*:

- Blanco, J.C. (ed.): *Mamíferos de España I*. Ed. Planeta, Barcelona. 457 pp.
- Mitchell-Jones, A. J., Amori, G., Bogdanowicz, W., Krystufek, B., Reijnders, P.J.H., Spitzenberger, F., Stubbe, M., Thissen, J. B. M., Vohralik, V. & Zima, J. 1999. *The Atlas of European Mammals*. The Academic Press, London. 496 pp.
- Quetglas, J. 1997. New records of bats (Chiroptera) for Minorca, Balearic Islands, Western Mediterranean Sea. *Mammalia*, 61: 611-614.
- Schober, W. & Grimmberger, E. 1996. *Los murciélagos de España y de Europa*. Ediciones Omega. Barcelona. 237 pp.
- Serra-Cobo, J., Amengual, B., López-Roig, M., Márquez, J., Torres, M., Ripoll, A., Sánchez, A. & Oliver, J. A. 2006. Catorze anys d'estudis quiropterològics a les Illes Balears (1993-2006). *Boll. Soc. Hist. Nat. Balears*, 49: 89-107.
- Simões, B. F., Rebelo, H., Lopes, R. J., Alves, P. C. & Harris, D. J. 2007. Patterns of genetic diversity within and between *Myotis daubentonii* and *M. d. nathalinae* derived from cytochrome b mtDNA sequence data. *Acta Chiropterologica*, 9 (1): 379-389.
- Trujillo, D. & García, D. 2008. Catálogo quiropterológico del parc natural de S'Albufera de Mallorca. *V Jornades de Medi Ambient de les Illes Balears (2008)*. *Soc. Hist. Nat. Balears*. 132-133.
- Trujillo, D. & García, D. in press. Primera cita del murciélago de Nathusius *Pipistrellus nathusii* (Keyserling & Blasius, 1839) en las islas Baleares. *Galemys*.
- Tupinier, Y. 1977. Description d'une chauve-souris nouvelle: *Myotis nathalinae* sp. nov. *Mammalia*, 41: 327-340.
- Warren, R. D., Waters, D. A., Altringham, J. D. & Bullock, D. J. 2000. The distribution of Daubenton's bats (*Myotis daubentonii*) and pipistrelle bats (*Pipistrellus pipistrellus*) (Vespertilionidae) in relation to small-scale variation in riverine habitat. *Biological Conservation*, 92: 85-91.

