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A STUDY OF THE GENUS *MYOTIS* KAUP (1829) IN MALTA (MAMMALIA: CHIROPTERA: VESPERTILIONIDAE)

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ABSTRACT

The literature records of *Myotis* species from the Maltese Islands are reviewed in the light of measurements of 30 specimens captured from various caves in Malta. The measurements confirm only the species *M. blythi* as being represented on the Maltese Islands

INTRODUCTION

Because of their nocturnal and retiring habits, it is difficult to make a full list of the Chiroptera occurring in a given region. Previous records of Chiroptera from the Maltese Islands have been reviewed by LANFRANCO (1969) who lists 13 species. Lanfranco notes that while the presence of some species on the Islands is doubtful, the list is far from exhaustive. Another species has since been added to the Maltese list by STORCH (1974). The genus *Myotis* is represented locally by four species: *M. myotis* (Borkhausen); *M. blythi* (Tomes); *M. daubentoni* (Leisler) and *M. capaccinii* (Bonaparte). The presence of the last two is doubtful and requires confirmation (LANZA, 1959; LANFRANCO, 1969). The others have been repeatedly listed as common, though LANZA (1959) queried the occurrence of *M. myotis* in the Maltese Islands.

M. blythi is only minimally different from *M. myotis*, so that its taxonomical status had been questioned for a long time. It is now accepted as a distinct species of smaller dimensions than *M. myotis*. Size alone however is not a reliable criterion for the identification of this species in view of the large individual variation. For example LANZA's study (1959) of variation in size in *Myotis* specimens collected from Europe revealed an intermediate group. These individuals may either be particularly large specimens of *M. blythi* or particularly small specimens of *M. myotis*. The present study attempts to fit the measurements of 30 *Myotis* specimens collected from three sites in Malta to the size ranges for the various species as defined by LANZA (1959).

RESULTS

The identification of the four European *Myotis* species may be partly based on size. Taxonomically useful measurements include forearm length, condylobasal length of the skull, and the superior dental file (c - m) length (LANZA, 1959 and Table 1). LANZA (1959) based his record of *M. blythi* from Malta on meaurements of eight *Myotis* individuals collected from Ghar Hasan, Malta and deposited in the Museo di Storia Naturale, Firenze. The measurements of these eight individuals, together with similar measurements made during the present study of 22 other specimens from three caves in Malta, are listed in Table 2.

Using the size criteria defined by LANZA (1959) outlined in Table 1, it would appear that *M. daubentoni* and *M. capaccinii* are not represented in the sample examined. The measurements in Table 2 suggest that 19 specimens can be unambiguously ascribed to *M. blythi*, while the remaining eleven specimens are intermediate between *M. myotis* and *M. blythi*. One specimen (csv VH2/c) had a superior dental file length of 10.1 mm suggesting the species *M. myotis*. However, the other two measurements considered place this specimen in the intermediate group. There is no specimen in the sample which can be definitely attributed to *M. myotis*. The *Myotis* population from the Maltese islands appears to have the following range of measurements:-

Superior dental file length (c-m):	9.1 mm ± 0.5 mm s.d.	
	8.6 - 10.1 mm	
Condylobasal length of skull:	21.2 mm ± 1.1 mm s.d.	
	19.0 - 23.5 mm	
Forearm length:	59.7 mm ± 2.0 mm s.d.	
	55.5 - 63.6 mm	

DISCUSSION

In the first list of bats from the Maltese Islands (GULIA, 1890), the genus *Myotis* was represented by three species: *M. myotis* listed as common; *M. daubentoni* listed as not very rare; and *M. capaccinii* listed as very rare. These three records were repeated by GULIA fil. (1914) who listed *M. myotis* as very common, and *M. daubentoni* and *M. capaccinii* as rare. A further species *M. blythi* was added to the list by LANZA (1959) based on his examination of the collection of Giglioli. Lanza failed to confirm the other three species and doubted their occurrence in the Maltese Islands. VAN DER BRINK (1967) reported the presence of *M. myotis* and *M. blythi* on the Maltese Islands. In reviewing previous records, LANFRANCO (1969) cast doubt on the occurrence of *M. daubentoni* and *M. capaccinii*, but recorded *M. myotis* as frequent and *M. blythi* as quite common. STORCH (1974) compared *Myotis* remains from the prehistoric layer of Ghar Dalam cave, Malta with recent specimens of *M. blythi* from Malta and *M. myotis* from Sicily. While the prehistoric remains could be attributed to *M. blythi*, there was no evidence of *M. myotis* in these. *M. blythi* in prehistoric deposits had been previously reported by CATON THOMPSON (1925). From the bone breccia in association with hippopotamus and elephant remains, STORCH (1974) described four

Species	Forearm length (mm)	Condylobasal length (mm)	Superior Dental file length (mm)
M. daubentonii	33.0 - 41.0	13.0 - 14.2	5.0 - 5.7
M. capaccinii	37.5 - 43.2	13.9 - 15.0	5.4 - 6.0
M. blythi	53.6 - 63.5	19.6 - 21.4	8.5 - 9.4
intermediate group	57.0 - 63.6	21.2 - 22.3	9.2 - 10.0
M. myotis	58.2 - 65.7	22.0 - 23.5	9.8 - 10.5

Table 1. Measurements range of *Myotis* species (LANZA, 1959).

Sex	Collection no.	Locality	Superior Dental File length (mm)	Condylobasal length (mm)	Forearm length (mm)
S	csv VM2/m	Girgenti cave	8.0 ±	-	-
M	Sch M3/3	Għar il-Friefet	8.4	21.0	57.7
S	csv VM2/j	Girgenti cave	8.5	19.0 ±	-
S	csv VM2/k	Girgenti cave	8.5	19.0 ±	-
S	csv VM2/l	Girgenti cave	8.5	20.0 ±	-
S	csv VM2/i	Girgenti cave	8.5	22.0	-
M	csv VM2/h	Għar il-Friefet	8.5	22.7	58.5
F	csv VM2/d	Girgenti cave	8.7	20.4	61.5
F	csv VM2/g	Għar il-Friefet	8.7	22.0	60.5
M	csv VM2/e	Għar il-Friefet	8.9	21.2	59.0
S	Sch M3/5	Girgenti cave	9.0	19.5	-
M	MFG 513	Għar Ħasan	9.0	-	57.2
M	MFG 513	Għar Ħasan	9.0	-	57.7
F	MFG 513	Għar Ħasan	9.0	20.9	60.3
?	rdg 1	Girgenti cave	9.0	21.0	58.0
M	MFG 513	Għar Ħasan	9.3	21.4 ±	59.5
M	Sch M3/2	Għar Ħasan	9.4	20.0	59.8
F	MFG 513	Għar Ħasan	9.4	20.7 ±	58.0
M	R 280775	Għar il Friefet	-	20.9	62.2
M	csv VM2/f	Għar il-Friefet	9.2	22.5	58.0
F	Sch M3/1	Għar Ħasan	9.2	22.8	61.5
M	R 020375	Għar il-Friefet	9.5 ±	21.0	60.3
F	csv VM2/b	Girgenti cave	9.5	22.0	61.0
M	R 020375	Għar il-Friefet	9.5 ±	23.5	55.5
M	Sch M3/4	Għar il-Friefet	9.6	21.0	57.7
M	MFG 513	Għar Ħasan	9.7	21.7	60.7
F	MFG 513	Għar Ħasan	9.7	21.8	62.0
F	csv VM2/a	Għar Ħasan	9.8	21.0	61.5
F	MFG 513	Għar Ħasan	10.0	21.9	63.6
F	csv VM2/c	Girgenti cave	10.1	21.0	61.0

Table 2. Measurements of specimens of *Myotis* from the Maltese Islands. MFG: Museo di Storia Naturale, Firenze (LANZA, 1959); Sch M3: Schembri private collection; rdg: R. Degiorgio private collection; csv VM3: author's private collection; R: live specimens released after obtaining data. Specimens marked S are skull remains, some fragmentary.

Myotis species: *M. exilis* Heller, *M. bechsteini robustus* Topal, *M. ghardalamensis* Storch and *M. capaccinii* (Bonaparte). The first three named are extinct. *M. ghardalamensis* has features which suggest that it could be the ancestor of the recent *M. blythi* and/or *M. myotis*.

The present study reports the presence of *M. blythi* in Malta, thus confirming previous observations (LANZA,1959; VAN DER BRINK, 1967; LANFRANCO, 1969; STORCH, 1974). This species appears to have been present on the Maltese Islands since prehistoric times as evidenced by remains from Ghar Dalam (CATON THOMPSON, 1925; STORCH, 1974). Its presence on the Island may date also to the Pleistocene by virtue of the similarities between it and *M. ghardalamensis* (STORCH, 1974).

The presence of *M. myotis* in Malta has not been confirmed by this study, although the species has been reported to be frequent (GULIA,1890; GULIA fil., 1914; VAN DEN BRINK, 1967; LANFRANCO, 1969). The absence of *M. myotis* in the sample studied could be attributed to the number of specimens examined, or on the non-specificity of the characters used for identification. The other two *Myotis* species reported to occur rarely (GULIA, 1890; GULIA fil. 1914) have not been confirmed in this study. Some authors (LANZA, 1959; LANFRANCO, 1969) have doubted the presence of these two species in Malta. *M. capaccinii* has been confirmed only from Quaternary deposits from Malta (STORCH, 1974). It is possible that *M. daubentoni* and *M. capaccinii* are rare migrants to Malta. Both occur in Sicily, while *M. capaccinii* is found also in Morocco and Algeria.

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