

## A contribution to the knowledge of the terrestrial Mammalian fauna of Comino and its satellite islets (Maltese Archipelago)

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### ABSTRACT

The present work aims to contribute to existing knowledge on Mammalia species occurring on Comino and its satellite islets and to provide additional records collected between the years 1998-2012. At the present state of knowledge, on the islands of the Maltese Archipelago there are 19 different species of terrestrial mammals (Erinaceomorpha: *Atelerix algirus*. Soricomorpha: *Suncus etruscus*, *Crocidura sicula*. Chiroptera: *Rhinolophus ferrum-equinum*, *R. hipposideros*, *Miniopterus schreibersii*, *Myotis punicus*, *Eptesicus serotinus*, *Nyctalus noctula*, *Pipistrellus pygmaeus*, *P. kulii*, *Plecotus austriacus*, *Tadarida teniotis*. Lagomorpha: *Orictolagus cuniculus*. Rodentia: *Apodemus sylvaticus*, *Rattus rattus*, *R. norvegicus*, *Mus musculus*. Carnivora: *Mustela nivalis*), more than half of which are bats. Out of 13 species listed here, 8 species are represented as new to the islands while 3 species are confirmed and 2 species are listed as unlikely occurring.

### KEY WORDS

Mammalia; Comino; Satellite islets; Maltese Islands.

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### INTRODUCTION

Very little work is directed to Maltese Mammalia, and even less is known about their distribution, especially with respect to the smaller islands. Some scattered notes provide some literature of past records.

The first data on the mammalian fauna of the Maltese Archipelago were reported by Gulia (1890). Busuttill & Borg (1925) were the first to attempt to list the mammalian fauna present on Comino Island.

Unfortunately their list only constitutes of Maltese vernacular names and this often causes difficulty in determining the precise species as local names change through time and may refer to a number of closely related species.

Lanfranco (1969) repeats these records in his work; Savona-Ventura (1982) focuses on giving new data on the mammals living on Comino and Cominotto. Baldacchino & Schembri (2002) along with the life history of mammalia and herpetofauna of the Maltese Islands, give also some localities where the latter species were recorded.

Recently Aloise et al. (2011) represented the possibility that *Crocidura sicula* (Miller, 1900) is present also on Comino. This latter record is confirmed in the present work.

What follows is the current mammalian fauna known to occur or have occurred on the latter islands. In addition to bibliographic data available, data were collected through direct observations, by collection of dead specimens and through discussion with local people.

All non-flying mammals of the Maltese Archipelago, however, are thought to have been introduced, at different times, by Men.

## MATERIALS AND METHODS

### Study area

The Maltese Archipelago consists of three main islands, which are Malta, Gozo (Ghawdex) and Comino (Kemuna) and a number of minor islands, islets and rocks. Comino, the third largest island of the Archipelago, is surrounded by following satellite islands: Cominotto, Old Battery's Rock, Lantern Point Rock, Comino Cliff Face Rock/ Pigeon Rock, Small Blue Lagoon Rock, Large Blue Lagoon Rock, Ghemieri Rocks (Fig. 1; Table 1).

### Comino (Kemuna)

Comino is the third largest island of the Maltese Islands, with an area of 2.7 km<sup>2</sup>. Comino is also considered to be the smallest of the three main is-

lands, but it can be referred as the mainland with respect to its satellite islets. However, due to its mono-geological component of Upper Coralline Limestone above sea-level, it has much less habitats than Gozo and Malta. Moreover with its small size, the range in topography is also limited, with a general tilt from South to North, identical inclination to the one of Marfa Ridge.

Cliffs are only dominant on the eastern and southwestern perimeters of the island, while only two considerably long valleys exist there. Sand-dunes are minimal and localised. With respect to vegetation communities, Thyme garigue and *Anthyllis-Teucrium* and *Euphorbia melitensis* phrygas are most common, with dense *Hypericum aegyptium* garigues along the coast, followed by *Pistacia lentiscus pseudomaquis* further inland and few *Pinus halepensis* woodland patches.

Other phrygas are rare on Comino, but a considerable large population of *Senecio bicolor* exists on Comino, in some areas it is dense enough to contribute to its own phrygana. Elsewhere in Maltese Islands, this species seems common in Malta and Gozo, and rare on the islets, but always scatte-

Name of the islet/rock	Code (fig.1)	Rank by area	Height (m)	Width (m) W-E orientation	Length (m) N-S orientation	Distance from the mainland (m)	Topographical inclination	Surface Geology	Soils
Cominotto	O	3	>20	500	~200	125	South to North	Upper Coralline	Terra Rossa
Large Blue Lagoon Rock	M	6	20	170	57	50	South to North	Upper Coralline	Terra Rossa
Small Blue Lagoon Rock	N	11	18	27	70	110	West to East	Upper Coralline	Terra Rossa
Pigeon Rock	L	15	20	20	45	20	East to West	Upper Coralline	Inglin complex
Battery Rock	J	22	6-7	18	9	4	East to West	Upper Coralline	Terra Rossa
Lantern Rock	K	23	8	7	17	30	/	Upper Coralline	/
Ghemieri Rocks (3 rocks)	X	19	6, 1, 2	14,14,10	19, 20, 38	10,82, 30	/	Upper Coralline	/

Table 1. Characteristics of the Satellite islets of Comino (Maltese Archipelago).



subsp. *ginzbergeri* is only present in the peninsula of the island (Sciberras & Sciberras, 2010).

### **Large Blue Lagoon Rock (Il-Hagra Ta' Bejn il-Kmiemen il-Kbira)**

Large Blue Lagoon Rock is the second largest islet of Comino. The islet has one slope, which is slightly steeper than that of Small Blue Lagoon Rock. The south perimeter is dominated by cliffs, except for a sizeable sea cave on its eastern side, which goes right through the islet. Its topographic landscape shows that it used to form part of the collapsed western valley of Comino.

The upper half is inhabited by vegetation. *Hypericium aegypticum* is the dominant species all over the islet, while *Daucus carota* is dominant on the west side of the islet. Some patches are dominated by *Convolvulus oleifolius* (Sciberras & Sciberras, 2010).

### **Small Blue Lagoon Rock (Il-Hagra Ta' Bejn il-Kmiemen iz-Zghira)**

Situated between Large Blue Lagoon and Cominotto, the Small Blue Lagoon Rock is the third largest islet of Comino. Most vegetation also occurs on its upper half. *Arthrocnemum macrostachyum* and *Daucus carota* are the dominant species all over the islet.

*Lygeum spartum* entirely covers a small patch of soil. *Lavatera arborea* (*Malva dendromorpha*), with only four specimens, barely survives near the *Lygeum spartum* and is only present on this islet in Comino's Archipelago (Sciberras & Sciberras, 2010).

### **Comino Cliff Face Rock/Pigeon Rock/Ta' Taht il-Mazz Rock (Il-Gebla ta' Taht il-Mazz)**

Ta' Taht il-Mazz rock is the fourth largest islet near Comino. The islet is very steep, with vertical sheer cliffs on its east side facing the western cliffs of Comino, while its western is slightly less steep, but still sheer.

The majority of species of plants occur on its west side and upper half of it, while only one species inhabits its east side. *Inula crithmoides* is a dominant species on the eastern face of the islet, while *Darniella melitensis* is dominant on the we-

stern cliff face of the islet. *Daucus carota* and *Limonium melitensis* are also dominant, but on a lesser extent. *Anthyllis hermanniae* and *Pistacia lentiscus* are rare on the islet.

No soil exists on the rock, vegetation is growing on the debris (the accumulating debris) and in rough weather the lower area is inundated by wave action (Sciberras & Sciberras, 2010).

### **Old Battery's Rock (Gebla ta' taht il-Batterija)**

This small rock is situated on the southeast of Comino under the old battery it is the second smallest rock of Comino. Remnant soil exists on the islet which is inundated by water wave action during rough weather. Till 2010 the flora of the islet consisted of 22 individuals of *Inula crithmoides* (Sciberras & Sciberras, 2010).

### **Lantern Point Rock (Gebla Tal-Ponta Rqiqa)**

Lantern Rock it is slightly smaller than Old Battery's Rock, it supports very little vegetation, only two species, *Limonium melitense* and *Inula crithmoides*. It is a large boulder of no more than 7 m high, with another small boulder lying on top of it (Sciberras & Sciberras, 2010).

## **RESULTS**

Erinaceomorpha Gregory, 1910

Erinaceidae G. Fischer, 1814

*Atelerix algirus* (Lereboullet, 1842)

Algerian Hedgehog

Taxonomy of Hedgehog of Maltese Islands was uncertain for a long time. The Hedgehog was first recorded for the Malese Islands by Gulia (1858), which, however, erroneously considers this population belonging to *Erinaceus europaeus*. After the taxonomic revision of the Maltese specimens (Lanfranco, 1969), currently all the populations occurring in the Maltese Archipelago belong to the species *Atelerix algirus*.

Busuttill & Borg (1925) mention that a species of hedgehog was imported to Comino from the nei-

ghbouring islands of Malta or Gozo probably by the ornithologist A. Schembri, in the 19th Century, to control infestations of *Blattaria* sp. Lanfranco (1969) and Savona-Ventura (1982) seem not to respond to the presence of this species to the island while Baldacchino & Schembri (2002) state that this species is not present.

Two of the authors (A. Sciberras and J. Sciberras) have recorded this species 8 times over a time span of 14 years and in one occasion (23.XI.2005) a nest was found containing 5 young. Specimens were encountered mostly in the centre of Comino Island, particularly in a location known as Ta' Caruana. Several naturalists informed the authors however that during the 1990's several specimens saved from Maltese roads, especially from Mgarr to Mizieb area, were released on the island for safety reasons.

Both white and dark forms were encountered on the island. The status of the population present in Comino is unknown. The Algerian Hedgehog is present in Comino, Malta and Gozo, but is absent from all the other smaller islands.

Soricomorpha Gregory, 1910  
Soricidae G. Fischer, 1814

***Crocidura sicula*** (Miller, 1900)  
Sicilian shrew

In the Maltese Archipelago is confirmed the presence of two species of Soricidae: *Suncus etruscus* (Savi, 1822) and *Crocidura sicula*. On the basis of current knowledge *S. etruscus* occurs only in Malta, and *C. sicula*, classified as *C. suaveolens*, is recorded only from the island of Gozo (Schembri & Schembri, 1979). Only recently has advanced the possibility that this species is present on Comino (Aloise et al., 2011).

Two specimens were obtained from the analysis of *Asio otus* (Linnaeus, 1758) pellets found from beneath the nest of the latter. Although most likely the latter specimens were caught from Comino, there is also the possibility that the specimens were caught from Gozo by the predator and then expelled on the nesting site. Similar pellets were collected by A. Sciberras containing *Rattus* sp. remains and were retrieved where *Asio flammeus* (Pontoppidan, 1763) was occasionally si-

ghted; presumably these remains belong to the latter species. On 18.III.2012 a dead specimen of *Crocidura sicula* was found drowned in a bucket presumably full of rain water close to the Northern Coast, confirming the presence of a population of this species on the island.

On 19.X.2011 a lower jaw bone of *Crocidura* sp. was found on Cominotto (A. Sciberras, J. Sciberras and L. Pisani, unpublished data) but the presence of a population of *Crocidura* Wagler, 1832 on this islet is not confirmed. The Sicilian shrew is absent from all the other smaller islands.

Chiroptera Blumenbach, 1774  
Rhinolophidae Gray, 1825

***Rhinolophus hipposideros minimus*** (Heuglin, 1861) Lesser Horseshoe Bat

This species was already more commonly known in Gozo and less in Malta, which is reported by the early work on the Maltese Islands (see Borg et al., 1997 and references therein).

On 12.III.2004 a dead specimen was found in a location known as Il-Hazina on Comino Island by one of the authors (A. Sciberras). This species is a new record for this island.

Vespertilionidae Gray, 1821

***Myotis punicus*** Felten, Spitzenberger & Storch, 1977 Mediterranean Mouse-eared Bat

Taxonomy and distribution of the Mouse-eared bat of the Maltese Islands have been debated for a long time, because of its morphometric peculiarities. In the past reported as *M. oxignatus* (Lanza, 1959; Van den Brink, 1967; Lanfranco, 1969), was then reported to *M. blyti punicus* and studied in detail (Felten et al., 1977; Savona-Ventura, 1984a, 1984b; Borg, 1998; Borg & Cachia-Zammit, 1988, 1994; Borg et al., 1990; 1997; Borg, 1998). *M. punicus* actually up to now is found on Malta and Gozo.

On 12.III.2004 and 22.XI.2005 a specimen of this species was found in a subterranean area close to the Comino tower. This is the first record for the island. On the Maltese Archipelago, this species was formerly common but has suffered immense

decrease in the 1980's and according to Baldacchino & Schembri (2002) the current population consists of only around 250-300 specimens.

***Pipistrellus kuhli*** (Kuhl, 1817)  
Kuhl's Pipistrelle

This species was presumed rare in the Maltese Archipelago before 1969 (Gulia, 1890; Lanfranco, 1969) but according to a 1990 study (Borg et al., 1990, 1997) the latter was found to be more frequent and it had a distribution all over the three main islands: Malta, Gozo and Comino.

***Pipistrellus pygmaeus*** (Schreber, 1774)  
Soprano Pipistrelle

Busuttill & Borg (1925) record the presence of two species of bats, noting that one preferred roosting in cracks while the other in caves. Lanfranco (1969) repeats this record. Savona-Ventura (1982) observed several specimens in flight and entering crevices at Santa Marija bay on VIII.1977. None were captured, and so the records are only from direct observations. It was suggested to be similar to *Pipistrellus pipistrellus* (Schreber, 1774). Nowadays it is being considered that *Pipistrellus pygmaeus* (Leach, 1825) is the likely species to exist in the Maltese Archipelago (Baldacchino & Schembri, 2002).

Several specimens were noted in flight by the three of the authors (A. and J. Sciberras, M. Sammut) and from field observations they look to be a *Pipistrellus* sp., but none were ever recovered for taxonomic identification. Several specimens were also observed flying over Cominotto and landing in crevices of Comino Cliff Face Rock.

***Plecotus austriacus*** (Fischer, 1829)  
Grey Long-eared Bat

Present on Malta, Gozo and Comino, the species was reported already by Gulia (1890, 1914), Lanza (1959) and Van den Brink (1967) as *P. auritus* (Linnaeus, 1758). Baldacchino & Schembri (2002) state that this species had a distribution all over the three main islands. Although the authors never observed this species on Comino a dead specimen was found on Cominotto Beach by one of

the authors (A. Sciberras) on 6.VII.2001. This is the first record for Cominotto island.

***Tadarida teniotis*** (Rafinesque, 1814)  
European free-tailed bat

A skull of this species was retrieved from *Larus* sp. pellet from Large Blue Lagoon Rock (13.6.2011 A. and J. Sciberras leg.). Although the shape and size of the island suggest that, probably, the animal was preyed on a different site than where the remains were found, this is an interesting record because besides being new to the islet, this species is extremely rare and was reported from the Maltese Islands twice before the discovery of this skull.

The first time was in 1993 in a locality known as Cittadella on the island of Gozo where 2 specimens were observed hunting insects under street lights. The same specimens were noted till mid-May in the same locality. Another specimen was recorded flying close to the cliffs of Had - Dingli in Malta in November of 1996 (Baldacchino & Schembri, 2002). To add to the interest on the same islet where the skull was located, on 8.VIII.2010 the same authors observed gulls, identified as *Larus michahellis* (Naumann, 1884) by M. Sammut, hunting bat specimens that approached the vicinity of a colony of 7 gulls that were resting on the islet.

This was just before sunset. It could be that this species does occasionally predate on bats as it was noted to predate on other terrestrial species such as *Podarcis filfolensis* (Bedriaga, 1876). It could also be that the bat was caught away from this site even offshore and it was regurgitated locally.

Carnivora Bowdich, 1821  
Mustelidae Fischer, 1817

***Mustela nivalis*** (Linnaeus, 1766) Weasel

Baldacchino & Schembri (2002) state that this species locally is restricted in the Maltese Islands to the island of Malta. It is very scarce on the main island but it is widespread and observations of this species range from the North to the South of the main island of Malta.

Whilst most observations of this species are of single individuals, a den with cubs was observed in Balluta area (Wardija Limits) (A. Sciberras, 5.IV.2002, unpublished data) and an adult with five cubs was observed at Mtahleb (M. Sammut & C. Cachia Zammit, 13.XI.2010, unpublished data), although illegal, most of the specimens (from Qammieh and Ahrax headlands in Mellieha) have been killed for taxidermal purposes. On 23.IV.2012, one of the authors (M. Sammut) saw an adult specimen of this species at a location known as Il-Hazina (Comino island) moving swiftly from behind a rubble patch.

Following that it climbed from behind a rubble wall and popped up on the rubble wall where it was seen very well and could be identified without any doubt. It disappeared again as swiftly as it had appeared. It was seen in the afternoon and though the author remained in the area for over an hour it was not seen again.

An indication of the presence of species on the island is the finding of 3 dead specimens of *Rattus norvegicus* and a young specimen of *Oryzotolagus cuniculus* near Comino's pig farm (6.V.2004, A. Sciberras, unpublished data). These carcasses showed signs that they had been killed and dragged from the neck, and less than 50 cm away a den similar to the one observed at Balluta was discovered.

No cubs or adults were observed despite the constant monitoring. Interestingly, people who have lived all their lives and constantly patrol the island of Comino have never seen the species on the island (S. Vella, pers. comm.). It is also worth noting that *Mustela putorius furo* (Linnaeus, 1758) was once observed on Comino in the 1970's (M. Psaila, pers. comm.).

In the past feral specimens have escaped from rabbit hunters which visited the island (S. Vella, pers. comm.). One of the authors (A. Sciberras) also has reports on *Mustela* sp. being present in Gozo but after checking the site (an area known as Munxar) 3 feral specimens of *M. putorius furo* were noted roaming free. One of the authors (J. Sciberras) received reports by locals of *Mustela* sp. at San Blas Bay.

After observing the site and description of the locals it was confirmed that a few specimens of *M. putorius furo* were present at the site. Lanfranco (1969) also records the latter feral species in Malta

and it is suggested that these must be escapees from *O. cuniculus* hunting parties.

Rodentia Bowdich, 1821

Muridae Illiger, 1815

***Rattus norvegicus*** (Berkenhout, 1769)

Brown rat

The Brown Rat is considered common, but can be very common and, under certain conditions, can become particularly problematic.

Its presence has been detected on all the major islands, Cominotto and many other smaller islands. The presence of rats on the Comino and Cominotto Islands is referred by Busuttil & Borg (1925), while Lanfranco (1969) mentions this species and *Rattus rattus*, Savona-Ventura (1982) observed a specimen of the species on Cominotto in IX.1975. Baldacchino & Schembri (2002) also record the presence of the species on Comino.

Presently including the period of observations stipulated above, this species is numerous on the islands and was recorded on the following islets (A. Sciberras, unpublished data): Manoel Island, Qawra Point or Ta' Fra Ben islet, Selmunett Island, Large Blue Lagoon Rock, Halfa Rock, and Taç-Ċawl Rock. On Fungus rock and Selmunett Island, it is known of its devastating impact on the Insular biodiversity (Baldacchino & Schembri, 2002; Sciberras, 2007; Sciberras & Schembri, 2008).

***Rattus rattus*** (Linnaeus, 1758) Black Rat

The Black Rat is reported as present and common on Malta, Gozo, Comino and some of the satellite islets. Busuttil & Borg (1925) record the presence of rats on the Comino and Cominotto Island while Lanfranco (1969); Savona-Ventura (1982) states in III.1978 he found a dead specimen of this species.

Baldacchino & Schembri (2002) and Aloise et al. (2011) also record the presence of this species on Comino including Malta and Gozo and state that it is common. The species is also known for Fungus rock (Borg & Sultana, 2003).

From experience with data also collected from a local Pest control company, this species is numerous where it is present but it does have a re-

stricted distribution. Most records of specimens come from Valletta and neighbouring harbour cities. In all the years of observations and data collection, this species was never encountered on Comino or its satellite islets.

***Mus musculus*** (Linnaeus, 1758)

House mouse

Widespread and very common, the House Mouse is abundant throughout. Present on all major islands, although not proven, its presence can be regarded as likely also on the islands of smaller size, because of its unique ecological characteristics.

Busuttil & Borg (1925) reported the presence of a mouse on Comino and so did Savona-Ventura (1982) when he noted a specimen at Santa Marija Bay in 1977. Since it was not caught, it could not be certain whether it was this species or *Apodemus sylvaticus* (Linnaeus, 1758). Several specimens were caught annually on the north Coast of Comino as a part of pest control treatment. From 34 studied samples all specimens resulted in being *M. musculus*.

Lagomorpha Brandt, 1855

Leporidae Fischer, 1817

***Oryctolagus cuniculus*** (Linnaeus, 1758)

Wild Rabbit

Busuttil & Borg (1925) reported the presence of a rabbit on Comino and this was repeated by Lanfranco (1969). This species was very common at their time and it is presumed that this species was introduced around 1890's on the latter Island. Prisoners and soldiers during 1914-1918 did short work on the rabbit population on Comino.

In 1969 Comino was declared a protected area from hunters and the rabbit population must have benefited, however Savona-Ventura (1982) assumed the survival of the animal through its scattered dropping and not so much on the sightings. He also recorded the species on Cominotto by finding droppings of the latter in IX.1975. In the 1980's, Myxomatosis was introduced and the Maltese population was virtually wiped out as happened with the Comino population.

A local resident introduced this species from Gozo again in several occasions as he did with other species (Sciberras, 2009). Today the Comino population is the largest in density when compared to the size with other Maltese Islands.

The populations recorded in past literature on Cominotto and Selmunett are extinct (Sciberras unpublished data). It is interesting to note that in the Maltese Archipelago, two colour morphs occur: the brown form and the yellow form. The Maltese population consists of almost entirely the brown form with occasional yellow and hybrids with domestic rabbits. Domestic rabbits are generally set free because of some kind of illness such as VHD (Viral Hemorrhagic Disease), Myxomatosis and the most commonly found Ear Cancer. If these survive they sometimes interbreed with the wild stock (Sciberras, 2006).

The Gozo population has both forms in equal numbers, whilst the Comino population constitutes entirely of the yellow form and only on very rare occasions, slightly darker specimens are noted.

## CONCLUSIONS

At the present state of knowledge, on the islands of the Maltese Archipelago are 19 different species of terrestrial mammals (Erinaceomorpha: *Atelerix algirus*; Soricomorpha: *Suncus etruscus*, *Crocidura sicula*; *Rhinolophus ferrum-equinum*, *R. hipposideros*, *Miniopterus schreibersii*, *Myotis punicus*, *Eptesicus serotinus*, *Nyctalus noctula*, *Pipistrellus pygmaeus*, *P. kulii*, *Plecotus austriacus*, *Tadarida teniotis*; Lagomorpha: *Oryctolagus cuniculus*; Rodentia: *Apodemus sylvaticus*, *Rattus rattus*, *R. norvegicus*, *Mus musculus*; Carnivora: *Mustela nivalis*), more than half of which are bats.

As regards the island of Comino and its satellite islands, most of these species are present (68,4%), not being up to now verified the presence of *S. etruscus* and *A. sylvaticus*, among the non-flying, and *R. ferrum-equinum*, *M. schreibersii*, *E. serotinus* and *N. noctula* among the bats.

With the species listed above, Busuttil & Borg (1925) reported that a certain Captain Stivala released on the island of Comino a pair of *Gazella sp.* These bred successfully but were eradicated by prisoners during the First World War.

A population of *Felis silvestris catus* (Schreber, 1777) introduced in the 1980's was exceeding over 20 specimens around Comino hotel (Northern Coast) in the late 1990's and it was eradicated by environmentalists for the protection of the native wildlife of Comino. This update on the mammalian fauna was a result of observations, made indirectly while the authors were conducting other studies or surveys mostly entomological, herpetological or ornithological.

Upon further investigation, especially on species most critical (eg. *Crocidura sicula* and Chiroptera), would be necessary to verify the status of the population, to guarantee their conservation in the Archipelago.

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