

Boll. Mus. reg. Sci. nat. Torino	Vol. 35 - N. 1-2	pp. 153-162	15.05.2019
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An introduction to mammal fauna of Symi island (Dodecanese, Greece)

ABSTRACT

Data on Symi mammals are very scarce. In the present work, the results of a research carried out on the *Falco tinnunculus* pellets analysis and on mammal carcasses are shown. The following *taxa* have been identified: *Talpa* sp., *Suncus etruscus*, *Apodemus mystacinus*, *Mus* sp., *Rattus rattus*, *Rattus* sp. As observed in most Mediterranean islands, the mammal fauna of Symi seems to be the result of the anthropic interventions in historical times, as well as of the biogeography of eastern Europe and western Asia.

Keywords: Symi, Mediterranean, Soricomorpha, Rodentia, biogeography.

INTRODUCTION

Since the Aegean islands are very numerous, several faunistic researches on mammal fauna were carried out over time but in some cases, there are poor or unknown data.

With regard to Symi, the island was firstly faunistically explored in 1926 during the period of Italian government (Ghigi *et al.*, 1929) but no data concerning the mammals (only invertebrates and herpetofauna) were collected (De Beaux, 1929). In two herpetological studies, a large rat was regurgitated by an adult *Hemorrhois mummifer*, when captured (Clark, 1972) while *Rattus* sp. and *Apodemus* cf. *mystacinus*, are reported among the prey of *Montivipera xanthina* (Cattaneo, 2007). The monographic work of Masseti (2012), about the mammals of the Greek islands, does not includes data on the mammal fauna of the island of Symi.

In this paper, a preliminary mammal list of Symi is presented, based mainly on raptor pellets analysis.

MATERIAL AND METHODS

Symi belongs to the Dodecanese Archipelago. It is located 22 Km N of Rhodes and approximately 5 km W of the Turkish coast (Fig. 1). Its nearest land neighbors are the Datça and Bozburun peninsulas of Muğla Province in Turkey. Its geographical coordinates are: 36°35'39.36"N, 27°50'11"E. It covers a surface area of 58.1 km². The coastline perimeter (85 km) is articulated with numerous bays, capes and steep cliffs (Fig. 2). Symi is surrounded by little islands and rocky islets. The largest are Nimos (North) and Seskli (South). Symi is mountainous and the highest relief is Mt. Vigla (620 m a.s.l.). Symi is made up mainly of limestone rock, with some areas characterized by flysch (Desio, 1923, 1924a, 1924b, 1928). Due to its rocky nature, cultivated areas are very few, except for Pedi and Niborios valleys. Symi lacks of a superficial hydrography. There are only wells and cisterns. From a climatic point of view, the climate of the island is a semi-arid Mediterranean, with short, mild and wet winters, followed by long, hot and dry summers.

The island is extremely arid, being largely composed of rocky terrain (Ghigi, 1929). Symi is mainly characterized by phrygic communities that are more developed in the northern part of the island while in the central and southern part the island is covered by a pre-existing conifer woodland of *Cupressus sempervirens* with stands of *Pinus brutia*. Niborios valley is rather narrow with a dry river bed used for the cultivation of fruit, vegetables and olives. The slopes of the valley are steep and rocky and are characterized by a phrygic vegetation constituted mainly of *Origanum onites*, *Thymbra capitata*, *Salvia fruticosa* and *Sarcopoterium spinosum*.



Fig. 1 - The island of Symi and its location in the southern Aegean Sea.

The pellets of common kestrel *Falco tinnunculus* were found between rocky ravines on the slope above the left bank of the river that showed several niches used by raptors. The other raptor species occurring in Symi are: barn owl *Tyto alba*, little owl *Athene noctua*, scops owl *Asio otus*, black kite *Milvus migrans*, Bonelli's eagle *Aquila fasciata*, booted eagle *Aquila pennata*, common buzzard *Buteo buteo*, long legged buzzard *Buteo rufinus*, short toed eagle *Circaetus gallicus*, European sparrowhawk *Accipiter nisus*, Levant sparrowhawk *Accipiter brevipes*, Eleonora's falcon *Falco eleonora*, lesser kestrel *Falco naumanni*, peregrine falcon *Falco peregrinus* (Savage and symifloraandfauna.jigsy.com, 2016).

Three fairly fertile valleys can be found on the island at Pedi (Wilson & Grillitsch, 2009), Drakounda and Aghios Vasilios. The Pedi valley area predominantly consists of wheat fields, while some olive groves and fruit orchards can be found close to farmland areas, whilst at Aghios Vasilios vineyards were also present.



Fig. 2 - The island of Symi and the places where the findings of mammals are found.

The analyzed material consists mostly of skulls and jaws from common kestrel *Falco tinnunculus* pellets (28 whole pellets and several other fragmented). In addition, two carcasses were considered. For identification of skulls have been used:

Niethammer & Krapp (1978, 1990); Kryštufek & Vohralík (2001, 2009). All material were collected by two of the authors (M.G., C.C.); the carcasses on 31 July 2017 and on 30 April 2018 at Pedi, the pellets on August 2017 in rocky ravines in Niborios bay.

RESULTS AND DISCUSSION

After the pellet analysis from Niborios bay, the following *taxa* was found: *Suncus etruscus* (2), *Apodemus mystacinus* (1), *Mus* sp. (8), *Rattus rattus* (2), *Rattus* sp. (18). The carcasses from Pedi were found to belong to *Rattus rattus* (31 July 2017) and *Talpa* sp. (30 April 2018).

On the basis of the obtained data, three species of mammals have been identified at species level, as regards the *Mus* specimens and a part of the *Rattus* and *Apodemus* specimens, the determination remains generic because of the fragmented skulls, in several cases also with missing teeth, while the *Talpa* carcass was excessively damaged. It should be noted that some of these animals could also have been preyed outside Symi island, since the proximity of the Turkish coast. This is in fact one of the limits of the studies with raptors pellets (Nappi, 2011). However, the available data allow us to make some preliminary considerations about the mammal fauna of Symi, also taking into account the dynamics that have affected the other Mediterranean islands.

Since man has arrived on Mediterranean islands, the composition of the mammal fauna has radically changed (Vigne, 1992; Masseti, 2002), due to hunting and competition with introduced wild and domestic mammals, whilst, as an example, the herpetofauna has remained almost stable (Corti *et al.*, 1999). At present, the endemic Pleistocene mammal fauna of Mediterranean islands appears to be largely extinct. According to Masseti (2009), because the Mediterranean area is perhaps the location in the world which has been much influenced by human activities over a long time, the mammal fauna of the islands shows a high degree of homogenisation and a loss of biodiversity.

Analyzing the mammal fauna of 13 Aegean islands (Kythnos, Seriphos, Melos, Delos, Naxos, Amorgos, Astypalaia, Crete, Armathia, Kasos, Karpathos, Rhodes and Tilos) out of a total of 22 species, one species is “endemic”, 13 “Palearctic pluriregional”, one “Western European”, four “Eastern European, Near Eastern and North African” and three “human commensal” (Masseti, 2003).

Based on an analysis carried out on 79 western Mediterranean islands (Cheylan, 1984), the dominant species were *Oryctolagus cuniculus*, *Rattus rattus*, *Apodemus sylvaticus* and *Mus musculus*; from the point of view of the number of species, the fauna of these islands is particularly impoverished compared to the corresponding continental portions. The prevalent species on these islands are generalist and with great adaptability; also in this case, the influence of man in recent time is recognized. Also in Central Mediterranean area, for example, in the small Italian islands, considering 47 islands in total, the most widespread species were *Rattus rattus* (present in all 47 islands), then *Oryctolagus cuniculus* (34), and

Mus musculus (33). Apart for bats, with the sole exception of *Crocidura sicula*, all species were introduced by humans (Angelici *et al.*, 2009).

Concerning the *Apodemus* genus, in the islands of the eastern Mediterranean there is a greater diversity of species, compared to the islands of the western Mediterranean, where the prevailing species is *A. sylvaticus*. This is due to a larger number of *Apodemus* species in eastern Europe and western Asia. The ecology of some of these species, in particular, allows them to adapt to island habitats. *Apodemus mystacinus*, the species found in Symi, occurs in Georgia, Greece (several Aegean islands), Iraq, Israel, Jordan, Lebanon, Palestinian Territory, Occupied, Serbia (Kosovo), Syrian Arab Republic, Turkey (Amori *et al.*, 2016). In the Greek islands, it is the more widespread species (Masseti, 2012) (Table 1). In Turkey, the continental portion closest to Symi, concerning the habitat selection, *A. mystacinus* is an adaptable species, present in both humid and dry environments, but rocks and stones are an essential component (Kryštufek & Vohralík, 2009).

This can explain its presence on many islands, even of small extent. In laboratory, no aggressive interactions of the two *Apodemus* were observed at low densities but when the densities increase, one can detect aggressive interactions with the death of *A. sylvaticus* (Granot, 1978). In addition, *A. sylvaticus* is relatively rare in the Balkan Peninsula and in Thrace while it is almost absent in Anatolia (Kryštufek & Vohralík, 2009).

As for the mole carcass, even if the specific determination was not possible, it is the first evidence of the presence *Talpa* genus on the island. In general, the records of moles are very rare. On the Greek islands, *Talpa stankovici* is present only in Corfu and Kefalonia (Masseti, 2012). In Italy, for example, moles are not present on any small island (Angelici *et al.*, 2009) while concerning an old reports of *T. romana* from Sicily by Galvagni (1837) and Camerano (1885) [which reports two specimens kept at the Museo Zoologico “La Specola” in Florence (Loy, 2008)], the presence of this species in Sicily has not been confirmed by other authors (Minà Palumbo, 1868; Doderlein, 1885; Cornalia, 1874; Gulino, 1939; Pasa, 1959; Toschi, 1959; Capolongo & Panasci, 1976; Loy, 2008). Although the discovery of a single carcass, in Symi, cannot be evidence of a stable population, the environment where it was found turns out to be suitable for moles.

In conclusion, the mammal fauna of Symi, seems to be the result of the anthropic interventions in historical times, as observed in most Mediterranean islands, and of the biogeography of eastern Europe and western Asia.

	<i>Apodemus flavicollis</i>	<i>Apodemus mystacinus</i>	<i>Apodemus sylvaticus</i>	<i>Apodemus witherbyi</i>
Aegina			+	
Agathonissi			+	
Alonissos		+		
Bozcaada				+
Cephalonia		+	+	
Chios	Extinct	+	+	
Corfu	+	+	+	
Crete		+	+	
Euboea	+	+	+	
Gokçeada	+	+		
Ikaria		+		
Itake			+	
Karpathos		+	+	
Kasos	+	+	+	
Kos		+	+	+
Kythera	+	+	+	
Lesbos	+	+	+	
Naxos		+		
Peristera		+		
Rhodes		+	+	+
Salamis		+		
Samos		+	+	
Samothrace	+	+		
Skyros	+			
Thasos	+	+		
Tilos		+		
Zakynthos	+	+	+	

Tab. I. The species of the genus *Apodemus* in the Greek islands (from data in Masseti, 2012 on a total of 99 islands considered).

RIASSUNTO

Un'introduzione alla mammalofauna dell'Isola di Symi (Dodecaneso, Grecia)

I dati riguardanti i mammiferi di Symi sono molto scarsi. In questo lavoro, vengono esposti i risultati derivanti dall'analisi di borre di *Falco tinnunculus* e dai ritrovamenti di alcune carcasse. Sono stati identificati i seguenti *taxa*: *Talpa* sp., *Suncus etruscus*, *Apodemus mystacinus*, *Mus* sp., *Rattus rattus*, *Rattus* sp. Come riscontrato nella maggioranza delle isole mediterranee, la mammalofauna di Symi sembra essere il risultato di interventi antropici in tempi storici, risentendo anche della biogeografia di Europa orientale e Asia occidentale.

Parole chiave: Symi, Mediterranean, Soricomorpha, Rodentia, biogeografia.

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