

A new mammal species from Kasos Island (Dodecanese, Greece): *Crocidura suaveolens* (Pallas, 1811) (Mammalia Soricomorpha Soricidae)

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ABSTRACT

The presence of *Crocidura suaveolens* (Pallas, 1811) (Mammalia Soricomorpha Soricidae) is reported for the first time on the island of Kasos (Aegean Sea). The distribution of shrews on the islands raises interesting biogeographical questions. On the basis of a recent research carried out by analysing mitochondrial cytochrome b gene, around the Mediterranean basin, the insular occurrence of *C. suaveolens* is a result of Pleistocene survivors as well as human introductions.

KEY WORDS

Biogeography; faunistic; Mediterranean; shrews.

Received 06.11.2020; accepted 11.01.2020; published online 15.03.2021

INTRODUCTION

The lesser shrew, *Crocidura suaveolens* (Pallas, 1811) (Mammalia Soricomorpha Soricidae), is a small mammal showing a wide distribution across the Palaearctic, from the Atlantic coast of Iberian Peninsula extending eastwards through Europe and Asia to Siberia (Palomo et al., 2016). The populations present from the Iberian Peninsula to western Asia are attributed to *C. gueldenstaedtii* (Pallas, 1811) by Burgin & He (2018) but this status is not universally accepted. In a subsequent publication on Italian mammals, for example, the name of *C. suaveolens* was maintained (Loy et al., 2019).

It is also present in several small islands. Concerning the Greek islands, of interest for this paper, in the major review about mammals' distribution (Masseti, 2012), *C. suaveolens* is reported from Corfu, Zakynthos, Kythera, Euboea, Crete,

Theodorou, Rhodes, Kos, Samos, Psara, Chios, Lesbos, Samothraki and Thasos. Later, the species was reported from Amorgos by Cheke & Ashcroft (2017) and, as part of the “Fauna of the Aegean Islands” project, was also found on Astypalea (Angelici et al., 2018), Karpathos and Saria (Nappi et al., 2020). In a recent trip to Kasos, concerning the latter project, *C. suaveolens* was also found here and some details are provided in this paper.

MATERIAL AND METHODS

Study area

Kasos Island, together with 14 small islands and islets, known as Kasonisia, of which Armathia is the largest, constitutes the southernmost island group of Dodecanese Archipelago (Fig. 1). It is 6 km southwest of Karpathos and 51 km east of Crete, the

smallest distance from the continent (south-west Turkey) is 152 km. Kasos is 11 km in length and 7 in width and covers an area of 66,41 km². It is a mountainous island whose highest peak reaches 601 m a.s.l. It is mainly formed of Mesozoic and Palaeogene limestones (Sen et al., 2014). The most common type of rocks are limestone and sandstone. Flat areas are mainly localized in the northern side between Vrisi and Antiperatos and between the valleys of the dried rivers Skylla, Empassia, Christos, in the south-western side (Argo and Troulli) and in the eastern part (Skafi). The climate of Kasos is characterized by hot and dry summers and mild winters with low rainfall. Kasos is extremely dry due to the lack of active streams and to the deforestation process it has undergone over the years as a result of overgrazing and wildfires. This affected the kind of vegetation which is mainly phrygic. Kasos together with Kasonisia constitutes a Special Protection Area (GR4210028) and a Site of Community Importance according to the European directives. It is very important for the avifauna of Greece and for its subfossils invertebrates, especially terrestrial molluscs. In addition, there are many rare and endemic plant species included IV Annex of the Directive 92/43/EEC as *Arenaria fragillima* Rech. f., *Hirtellina fruticosa* (L.) Dittrich, *Salsola carpatha* P.H. Davis, that are all protected by the Greek Law

(Presidential Decree 67/81). In general terms, the whole site has great aesthetic value featuring also a variety of habitat types remarkable for their representativity as well as for their conservation status.

Kasos was first inhabited by Phoenicians and later by Dorians. During the Persian War, it was dominated by the Athenian State. The Roman rule followed. Kasos has always been harassed by pirates during its history. There is no news of the island during the Middle Ages. From 1537 Kasos was occupied from the Turks and in the years 1579–1599 from the Russians. On 1824 Kasos was destroyed by an ex-pirate with a fleet of 45 ships. In 1912 the Italians occupied the Dodecanese including Kasos until 1946 when the Union with Greece took place. On 1821 the population amounted to about 11.000 and according to the 2011 census the population in the island amounted to 1084. It is concentrated in the north of the island in the villages of Fry, Aghia Marina, Panagia, Poli and Arvanithochori.

Samples

The analyzed material consists of some remains found in barn owl, *Tyto alba* Scopoli, 1769, pellets near the Antiperatos Bay collected in 30 July and 7 August 2020. More precisely, 11 skulls, 29 right and 17 left hemi-mandibles (35°23'55"N 26°54'06"E,

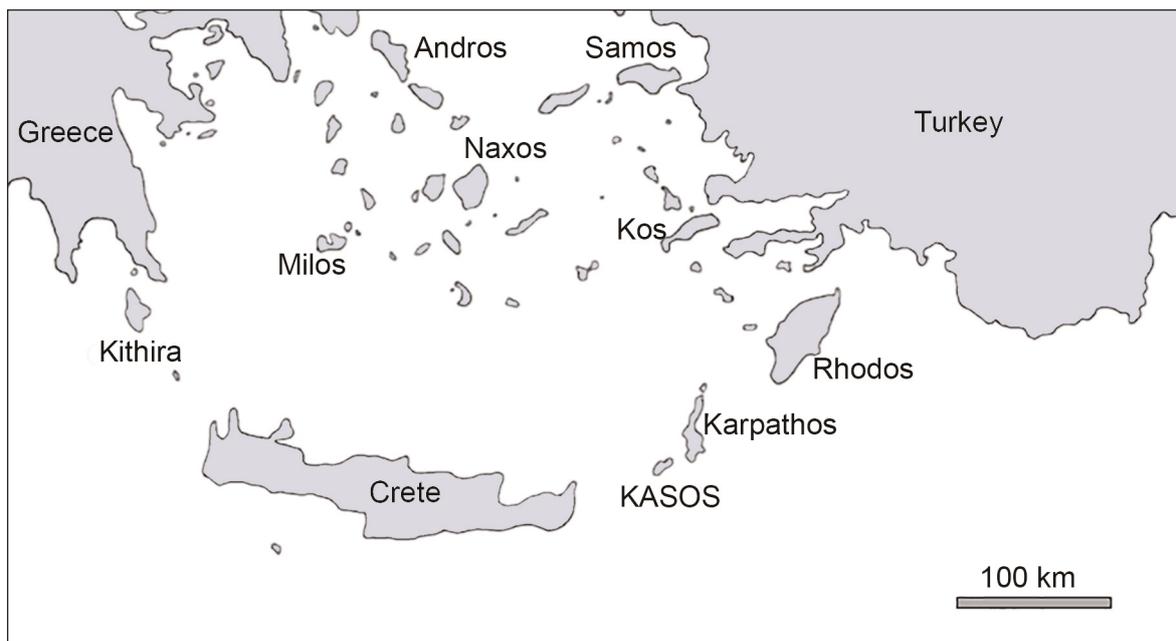


Figure 1. The islands of Kasos and its location in the Aegean Sea.

205 m a.s.l.), 15 skulls, 12 right and 10 left hemi-mandibles (35°23'52"N 26°53'55"E, 186 meters a.s.l.). Both sites were small caves on limestone cliffs (Fig. 2).

The identification was carried out according to Richter (1970), Vogel et al. (1989), Niethammer & Krapp (1990), Sarà et al. (1990) and Kryštufek & Vohralík (2001). The studied characters are: profile of the skull in lateral view, shape of the zygomatic bones, shape of the upper fourth premolar, shape of the articular condyle of the jaw. Zygomatic breadth and mandibular height (Fig. 3) were measured by a calliper of 1/100 mm precision, the values were later approximated at 1/10 mm.

The specimens are preserved in Collezione Osteologica Mauro Grano (COMGR), Rome, Italy.

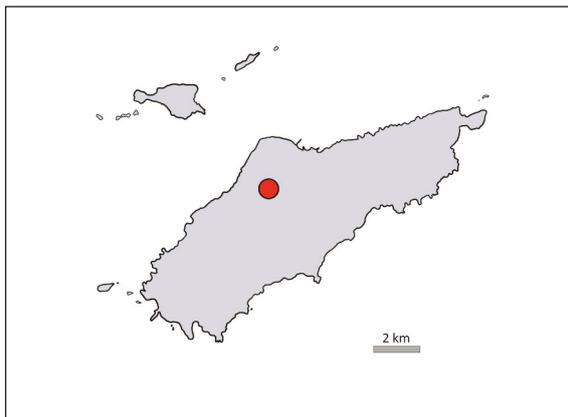


Figure 2. The island of Kasos and the finding sites of the skulls.

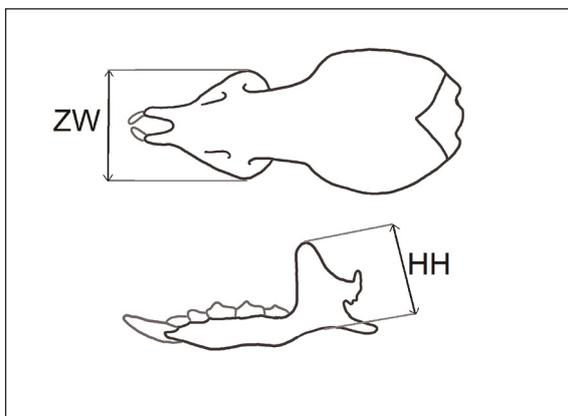


Figure 3. The two measurements taken on the skulls of the examined *Crocidura suaveolens* (redrawn from Vesmanis, 1976).

RESULTS

On the basis of the morphological and biometrical analyses, the studied specimens belong to *C. suaveolens*. Some skull measurements are summarised in Table 1.

	N	Min	Max	mean	s.d.
ZW	20	5.5	5.9	5.7	0.10
HH	52	4.1	4.8	4.5	0.14

Table 1. Some skull measurements (in mm) of the *Crocidura suaveolens* samples from Kasos. ZW: zygomatic width; HH: hemimandible height.

DISCUSSION AND CONCLUSIONS

From the analysis of the available data, the results obtained represent the first *Crocidura suaveolens* report in Kasos, the other mammal species reported for the island are: *Oryctolagus cuniculus* (Linnaeus, 1758), *Apodemus flavicollis* (Melchior, 1834), *A. mystacinus* (Danford et Alston, 1877), *A. sylvaticus* (Linnaeus, 1758), *Rattus rattus* (Linnaeus, 1758), *Mus musculus* Linnaeus, 1758 (Masetti, 2012).

The finding of a good number of specimens, in pellets collected in two different sites, allows to state that on Kasos there is a stable population of *C. suaveolens*. In fact, these cannot be considered as some predations on other islands or on the mainland, by erratic raptors, as sometimes it can happen (Nappi, 2011), with a subsequent emission of the pellets at Kasos.

According to Avenant (2005), owl pellet analysis is a valuable asset during small mammal monitoring studies, but should never be seen as an alternative for small mammal trapping when small mammal community structure is the focus of study. In any case, in the faunistic studies from owl pellets, the barn owl is traditionally considered as the best source (Nappi, 2011).

The presence of shrews on the islands raises interesting biogeographical questions. On the basis of a recent research carried out by analysing mitochondrial cytochrome b gene, around the Mediterranean basin, the insular occurrence of *C. suaveolens* is a

result of Pleistocene survivors as well as human introductions (Dubey et al., 2007).

In the Aegean islands, although several faunistic researches on mammal fauna were carried out over time, in some cases, there are poor or unknown data. Further naturalistic trips are desirable both to report new species and to better clarify the complex biogeography of these places.

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