

New herpetological reports for the Aegean islands of Kitriani, Telendos and Pserimos (Greece)

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Abstract. During naturalistic research performed in August of 2022 and 2023 in several Aegean islands, three new herpetological records occurred: *Hemorrhois nummifer* on Telendos Island, *Laudakia stellio* on Pserimos Island and *Dolichophis caspius* on Kitriani Islet.

Key words: Aegean islands, first records, *Dolichophis caspius*, *Hemorrhois nummifer*, *Laudakia stellio*.

Introduction

Greece is located at the biogeographical crossroads of three continents, each making its distinct biological contribution, making the country an invaluable site for biodiversity (Lymberakis & Poulakakis, 2010). The Mediterranean climate with long, dry and hot summers and mild winters together with the notable environmental heterogeneity constitute suitable conditions for reptiles but also for various amphibian species (Pafilis, 2010). Aegean Islands host a rich herpetofauna with many endemic taxa, which are mainly concentrated in the oldest islands where the long history of isolation provided the necessary conditions for speciation and in the southernmost part of the mainland, Peloponnese, thanks to historical biogeographical reasons (Pafilis, 2010). The richness of the Aegean herpetofauna attracted numerous herpetologists since the 19th century and even today many new records on insular ranges are still added (Lymberakis et al., 2018). Since the Aegean Sea is made up of a notable number of islands and islets, several smaller islands have been overlooked by herpetologists and only re-

cently have been investigated (Kalogiannis & Stefanopoulos, 2023; Strachinis, 2022; Tzoras et al., 2019).

Pserimos and Telendos belong to the Kalymnos Island Group, which lies in the southeast part of the Aegean Sea between the islands of Leros and Kos (Fig. 1). The herpetofauna of these small islands partially mirrors, albeit to a lesser extent, that of the mother islands. The small size of these islands and the scarcity of water allow only a few frugal reptile species to exist. Among snakes, *Eirenis modestus* and *Telescopus fallax* prove to be particularly adaptable to surviving in extreme conditions such as those found on these islands and many other small Aegean islands (Cattaneo, 2018).

Pserimos is a bridge island between Kalymnos and Kos. The most frequent connections are with Kalymnos to which it belongs administratively. It is very close to the Turkish coast (8 km from the Bodrum Peninsula). It can only be reached by sea from Kalymnos (7 nautical miles) or Kos (6-10 nautical miles). The surface of the island is 14.6 km² with a maximum elevation of 268 m a.s.l. and has only 130 inhabitants. The

island is essentially flat, arid and very degraded due to overgrazing and human impact over the centuries. There are no active watercourses, only wells, and it has no road network, only dirt roads. Phrygana, carob and olive trees make up the island's landscape. So far the island appeared to harbour only the following species: *Testudo graeca*, *Ablepharus kitaibelii*, *Blanus strauchi*, *Ophisops elegans*, *Hemidactylus turcicus*, *Mediodactylus kotschyi*, *Telescopus fallax* and *Eirenis modestus* (Itescu et al., 2018).

Telendos is less than 5 km² and just 750 meters away from nearby Kalymnos. Originally, Telendos was part of Kalymnos. It was formed during historical times (Triantis et al., 2008) after a devastating earthquake in 554 AD (Dawson, 2015). Telendos looks like a mountain submerged in the sea. It reaches an altitude of 459 m a.s.l. and

is very steep. Vertical limestone cliffs dominate the island, making it rocky and difficult to walk around. The landscape consists of phrygana which mirrors that of the mother island and its most representative elements are *Genista acanthoclada*, *Calicotome villosa*, *Origanum onites*, *Salvia fruticosa* and *Ononis ramosissima*, interspersed with patches of *Pistacia terebinthus* and *Daphne gnidoides*. There are also scattered olive trees. There are no roads but only rough paths that run along the western and eastern parts of the island. It has no water sources, and the only settlement is a small port with very few inhabitants. The only way to get to Telendos is by small boats from nearby Myrties, located on the coast opposite Kalymnos Island. The herpetofauna of Telendos includes *Laudakia stellio*, *Ophisops elegans* and *Blanus strauchi* (Cattaneo et al., 2020; Sindaco et al., 2014).

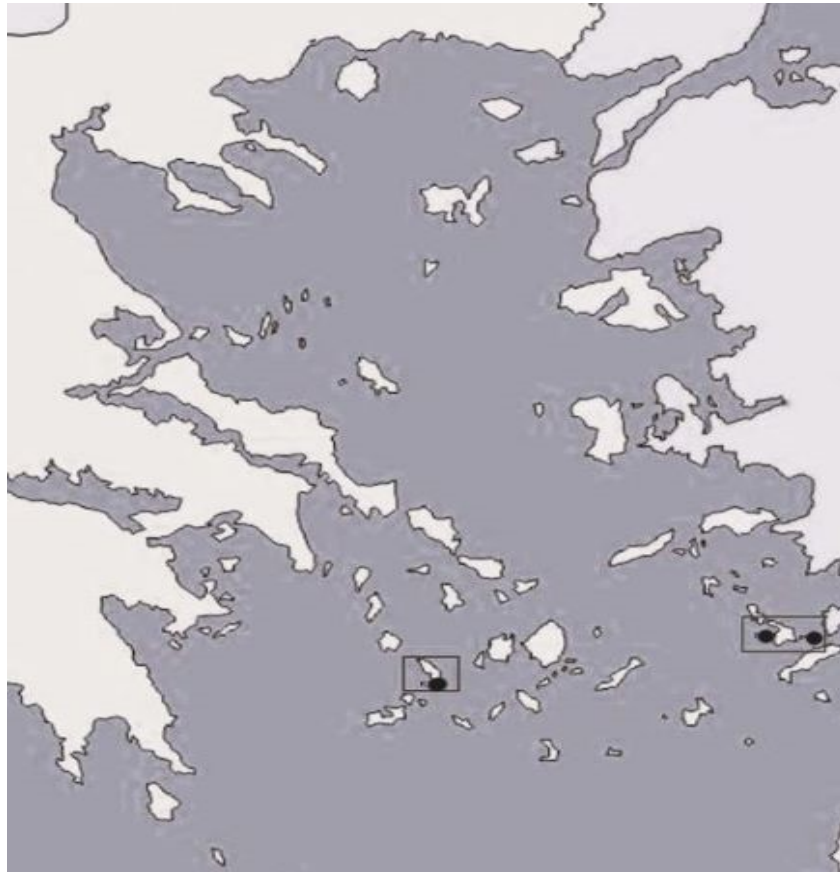


Fig. 1. Geographical position of Kitriani, Telendos and Pserimos in the Aegean Sea.

The islet of Kitriani, located off the Cycladic island of Sifnos (Fig. 1), which is less than 1 km across with a maximum elevation of 136.8 m a.s.l., is uninhabited. The only building on the islet is Panagia Kitriani, the oldest ecclesiastic monument

of Sifnos, built between the 10th and 11th centuries (Kioussis, 2022). From a floristic point of view, it is mainly characterized by dense low scrub of *Juniperus turbinata* and *Pistacia lentiscus*. The islet can only be reached by private boats from Plati

Yalos, a village located on the coast opposite of Sifnos. To date, only *Mediodactylus kotschy* and *Podarcis erhardii* (Grillitsch & Tiedemann, 1984; Itescu et al., 2018), also found on the mother island of Sifnos (Cattaneo, 1989), were known for Kitriani.

Materials and Methods

In August 2022, the Cycladic island of Sifnos and the islet of Kitriani, located on the SE edge of Sifnos, were the subject of scientific research. In August 2023, our research shifted to the Dodecanese islands of Kalymnos, Pserimos and Telendos.

The identification of the observed species occurred through direct observation in the field and the study of exuviae or part of them. For scale counts, the following methods were used:

- the mid-trunk dorsal scales were counted in a transverse line at the height of half the total number of ventral scales;
- the ventral scales were counted with the classic method, which considers the mid-ventral scales that are wider than they are long;
- the subcaudal scales were counted from the first postcloacal scale that is in contact with the contralateral along the caudal midline.

Information relating to herpetofauna of the islands was relied from the relevant literature (Itescu et al., 2018) and from the museum collec-

tions preserved at the Natural History Museum Vienna (NHMW) and the Natural History Museum of Crete (NHMC).

Results and Discussion

Kitriani Islet

During our research on 13 August 2022, one dead specimen of European whip snake, *Dolichophis caspius* (Gmelin, 1789) was found near the coast of Kitriani (36°54'10"N - 24°43'40"E, 36 m; Fig. 2). The European whip snake is present on Sifnos and is one of the most common snake species in the Aegean islands (Cattaneo, 2010; Cattaneo et al., 2020, 2023). Several hypotheses could be made about the presence of *D. caspius* on Kitriani. It could be the consequence of passive translocation, of active dispersal or it could be indigenous to the island. The occurrence of *Podarcis erhardii* and the authors' finding of remnants of bones of *Rattus rattus* on Kitriani are indicators of the presence of trophic sources suitable for the survival of this species. It is worth noting that the found specimen appeared "knotted", a posture that snakes sometimes assume during predation or as a result of various pathologies, or it could be the consequence of a transport to the island by a scavenger bird or raptor.



Fig. 2. Specimen of *Dolichophis caspius* found on Kitriani Islet.

Pserimos Island

Despite its small size the herpetofauna of Pserimos is quite substantial and partly mirrors

that of Kalymnos and Kos (Cattaneo, 2005a,b). The island appeared to harbour only the following species: *Testudo graeca*, *Ablepharus kitaibelii*, *Blanus*

strauchi, *Ophisops elegans*, *Hemidactylus turcicus*, *Mediodactylus kotschy*, *Telescopus fallax* and *Eirenis modestus* (Itescu et al., 2018). On 4 August 2023, several individuals of different ages of *Laudakia stellio* (Linnaeus, 1758) were observed among the rocks along the dirt roads that run between the island's uncultivated fields (36°56'01"N - 27°08'28"E, 14 m). Several other individuals of *L. stellio* were noticed near a dry reservoir and on carob trees (Fig. 3). The observation of young and adult individuals suggests that the population of this saurian is stable and reproductive. It most likely came from Kalymnos or Kos, the result of intentional or unintentional human translocation. *Laudakia stellio* is widespread in the Aegean Islands (Grano & Cattaneo, 2019; Karameta et al., 2022).

In addition to this species, several individuals of *Ophisops elegans* were observed and two exuviae were found, one of *Eirenis modestus* (17 dorsals, 167 ventrals, more than 25 pairs of subcaudals) and one of *Telescopus fallax* (19 dorsals, about 220 ventrals, 69 pairs of subcaudals). As for *T. fallax*, the Kalymnos population also seems to exhibit very high values in the number of ventral scales (over 220); this claim is based on the number detected on another exuvia found in Kalymnos a few days later, as well as previous data reported by the third author (Cattaneo, 2010). As a rule, in the nominal subspecies that inhabits the other Aegean islands, it seems that the ventral scales values stay well below 220 scales. Both *E. modestus* and *T. fallax* are also well represented on the mother island of Kalymnos.



Fig. 3. *Laudakia stellio* on a carob tree (Pserimos Island).

Telendos Island

Considering the recent formation of Telendos it is plausible that the reptile species occurring on

the islet are indigenous and did not arrive from Kalymnos through passive translocation. In fact, the boats that come to Telendos from Kalymnos

are small and used exclusively for tourist transport. Until now, the herpetofauna of Telendos included *Laudakia stellio*, *Ophisops elegans* and *Blanus strauchi* (Cattaneo et al., 2020; Sindaco et al., 2014). During naturalistic research carried out on the island on 1 August 2023, an exuvia of *Hemorrhois nummifer* (Reuss, 1834) was found in a rather sheltered xeric site at the base of a limestone cliff (37°00'27"N - 26°53'55"E, 164 m). The noticeable size of the moult (unfortunately not complete) with more than 86 pairs of subcaudals, the keeled scales, and what can be perceived of the pigmentation, suggest that it belongs to *H. nummifer*, a species which is widespread on Kalymnos.

On various Aegean islands, most of the specimens of this species have been found in shady or semi-shady, relatively warm, and sheltered microhabitats. Sometimes they are difficult to observe, as they frequent places rather far from the normal and recurrent elements of the habitat, such as stonewalls, hedges, embankments, etc. Therefore, it is possible that *H. nummifer* occupies a particular sub-niche, obviously compatible with the niche of the other co-existing ophidian species such as to reduce their selective pressure (direct or indirect).

The presence of *H. nummifer* on the large eastern Aegean islands, such as Lesbos (Hofstra, 2003), Samothrace, Chios (Strachinis & Lymberakis, 2013) and Samos (Speybroeck et al., 2014), has only recently been reported and often with reference to the autumn months, i.e., months in which any competing species are not active. In other words, one could consider the hypothesis of a sophisticated spatiotemporal adaptation to the close syntopy with the other interacting ophidian species. The colouration of this snake (mime) resembles that of *Montivipera xanthina* (model), with which it shares a large part of the range (Aegean - Anatolian distribution). The resemblance to the Viperid contributes to its fitness. Imitation includes defensive behaviour in aposematic displays (retracted and flattened head, wheezing and dilated lung) (Schätti & Agasian, 1985). Recently Jablonski & Ahmed (2023) reported the occurrence of melanistic individuals of *H. nummifer* in the Kurdistan region of Iraq, where melanistic elapids such as *Walterinnesia morgani* also live. The similarity in coloration could be the result of particular shared environmental conditions, but also the outcome of a sophisticated adaptation that would lead the snake to pheno-

typically imitate sympatric venomous species. From the above, it follows that *H. nummifer* is a species with a great adaptability (Schätti & Agasian, 1985). Its presence on Telendos, where the environmental conditions would seem unsuitable for the survival of medium to large ophidian species, is therefore not surprising.

Conclusions

A new contribution to the knowledge of the Aegean herpetofauna has been made thanks to the discovery of three species of reptiles in the small islands of Pserimos, Telendos and Kitriani. The herpetological findings made by the authors once again emphasizes the naturalistic richness of the Aegean islands and underline how the small islands, often overlooked due to the difficulty of research, can prove interesting for their biodiversity.

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