MISSION REPORT

May, 3th to 9th 2023

PIM expedition to the Greek Ionian small islands - 2023

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GENERAL DATA

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Figure 1: the team (c) C;Giannou

Abstract / Résumé

RESUME: En mai 2023, une mission PIM a été organisée en Grèce sur une dizaine d'îlots de la mer Ionienne, permettant d'améliorer les connaissances de ces îles sur différents compartiments biologiques: herpétologie, botanique, avifaune et inverterbrés. Cette mission a notamment permis de signaler pour la première fois la présence de reptiles pour certains îlots inexplorés.

Mots-clés: Reptiles, Flore, Avifaune, Entomologie, Méditerranée, Îles Ioniennes, Grèce.

ABSTRACT: In May 2023, a PIM naturalist mission was organised in Greece to a dozen islets in the Ionian Sea, enabling knowledge improvement of these islands in terms of various biological compartments: herpetology, botany, avifauna and invertebrates. In particular, this mission enabled the presence of reptiles to be reported for the first time on certain unexplored islets.

Key-words : Reptiles, Flora, Avifauna, Entomology, Mediterranean, Ionian Islands,

CONTEXT

L'Initiative pour les Petites Iles de Méditerranée

Initiated in 2006 by the French Conservatoire du Littoral, PIM Initiative coordinates an international program to promote and assist in the management of Mediterranean and macaronesian small islands. PIM Initiative is an international NGO whose aim is to preserve Mediterranean islands of less than 1,000 hectares by implementing practical conservation measures on the ground. As refuges for many endangered species in ecosystems that are sensitive to global change, these small islands are at the heart of the challenge of safeguarding biodiversity. PIM's teams draw on a large network of experts and managers from all over the Mediterranean to support the creation and development of island protected areas, using an integrated approach that promotes:

- Improving knowledge of island ecosystems
- Setting up co-management systems for protected sites
- Capacity-building for managers
- Ecological restoration of degraded natural environments
- Communication and advocacy for better protection of these areas.

Figure 2: Participants to the PIM mission

INDEX

LIST OF ABBREVATIONS

- PIM: Initiative pour les Petites Iles de Méditerranée

The flora and fauna of many Greek Ionian islands, especially the larger ones, are relatively well known, however data lack for some of the numerous islets and rocks. The objective of the Mission PIM - Greece 2023 was to improve knowledge of the flora and fauna of the small islands located in an area between Lefkada, Ithaca and the coast of Western Greece (Fig 3), favoring the unexplored ones but also visiting some of those for which data are already available.

Figure 3- Study area Mission PIM - Greece 2023, Ionian islands.

Program of the mission :

4th May 2023

- islet east of Alaphonisi (NE of Meganisi) – observation by boat (Fig.4)
- islet of Alaphonisi (NE of Meganisi) - observation by boat (Fig.5)
- Islant of Meganisi
- surroundings of the Kalamos bay

Figure 4: islet east of Alaphonisi (NE of Meganisi)

Figure 5: islet east of Alaphonisi (NE of Meganisi)

May 5th 2023

- Formikoula Islands
- Mitikas (mainland Greece, Aetoloakarnania area)

May 6th 2023

- Provati Kastou
- Prasonisi island (Fig.7)
- a small islet west-south-west of Prasonisi and very close to the island of Kastos (Fig.8)
- Atokos (Fig.9)
- Itaka

Figure 6: coast of Provati Kastou

Figure 7: Prasonici

Figure 8: a small islet west-south-west of Prasonisi

Figure 9: Atokos

May 7th 2023

- Kythros (Fig.10)
- Kalamos (Fig.11)

Figure 10: Kythros

Figure 11: Kalamos

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This report focuses on amphibian and reptile species, the former being found exclusively on large islands where bodies of water are present.

Methods

The Visual Encounter Survey (VES) technique (Crump & Scott, 1994) and active searching were adopted to search for herpetofauna on the islands.
Whenever possible, picture of the different species observed were taken.

Tissue samples from the lizards (tail tip) were collected after authorization from the Greek government (see general mission report) and sent to the Natural History Museum of Crete for genetic analysis.

The time indicated in the report refers to solar time.

Results

The expedition started on May 4 from Lefkada under adverse weather condition.
While sailing to the study area we passed by the islet east of Alaphonisi (NE of Meganisi) and the islet of Alaphonisi (NE of Meganisi), and then stopped at Meganisi. Due to the poor weather conditions only one reptile species, Hemidactylus turcicus (38.665473, 20.791305), was observed on the latter island.

In the afternoon we visited the surroundings of the Kalamos bay at 38°35'46"N 20°53'9"E, with relatively good atmospheric conditions and sunny weather.

Figure 12: Meganissi Island.

Figure 13: Formikoula Islands

On May 5 the Formikoula Islands were visited (Fig. 13).

Both islands are covered by dense vegetation (especially Large Formikoula) and characterized by landslides which do not make access to the upper part of the islands particularly easy.

Figure 14: Large Formikoula. © C.Giannou

The Large Formikoula Island (Figs 14) was visited first, approximately from 8:30 to 10:15.
The only reptile observed on the island is *Podarcis ionicus* (Fig. 15), first time recorded for the island. Approximately 20 individuals were observed, a tissue sample (tail tip) for genetic research was taken from a subadult male.

Fig. 15 – Large Formikoula (East side).

Fig. 16 - Large Formikoula (NW slope).

Figure 15: Podarcis ionicus, subadult male, Large Formikoula.

Figure 16:South-East Formikoula Islet

Podarcis ionicus (Figs 17-18) was also reported for the first time from the South-East Formikoula Islet (Fig. 8), visited from about 10:40 to 12:15. Approximately fifteen individuals (adults and subadults) were observed and two tissue samples (tail tips) were taken for genetic analyses.

Figure 17:Podarcis ionicus, South-East Formikoula Islet.

Figure 18: Podarcis ionicus, South-East Formikoula Islet.

Figure 19: Kalamos Island.

During the first and brief visit to Kalamos (Fig. 19), which took place in the afternoon, only two individuals of *Hemidactylus turcicus* were found under corrugated plastic sheets, no other active reptiles, despite the apparently favorable atmospheric conditions, were observed. A second visit to the island was made at the end of the expedition (see further on in the text).

In the evening we stopped in Mitikas (mainland Greece, Aetoloakarnania area). While walking towards the chapel of Agia Eleousa, the following amphibian species were observed:
Lissotriton graecus, many individuals of *Hyla arborea* and several of *Pelophylax kurtmuelleri*, as well as the following reptiles *Mauremys rivulata, Hemidactylus turcicus, Xerotyphlops vermicularis, Elaphe quatuorlineata* and *Natrix natrix.*

On May 6 (between 8:00 and 10:30 a.m.), the island of Provati Kastou (Fig. 20), located near the northern coast of Kastos, was visited.

Figure 20: Provati Kastou Island (in the background Kastos Island).

Despite good weather conditions and careful search no reptiles were observed.

As far as snakes are concerned, one was observed swimming from one island to another, which could indicate that these animals easily move from one island to another as already observed to happen in other island contexts (Montes et al., 2021; Corti et al., 2022).

Figure 21: Prasonisi Island.

Figure 22: Dense vegetation on Prasonisi Island.

The island of Prasonisi (Fig. 21) was visited from about 11.30 to 13.30. This island is rich in vegetation, often impenetrable (Fig. 22) but alternating with open grassy areas. The presence of reptiles is reported here for the first time. About twenty individuals of very active *Lacerta trilineata*, and 5 individuals (3 adults and 2 juv.) of *Mediodactylus kotschi* were observed, the latter species almost always on stones. The tail tip of a juvenile gecko was collected for genetic analysis.

Figure 23: Islet WSW of Prasonisi.

No reptiles were observed on a small islet, relatively rich in vegetation, located west-south-west of Prasonisi and very close to the island of Kastos.

Figure 24: Atokos Island

A short survey on Atokos Island (Fig. 24) began approximatively at 3.00 pm and lasted about 2 hours. Several *Podarcis ionicus* (Figs 25 - 26) were observed and tissue samples (tail tips) for genetic analysis were collected. The Ionian lizard has been observed in the vegetation in sunny spots while *Algyroides nigropunctatus* (Fig. 27), relatively abundant, only on walls and buildings. An individual of *Hierophis gemonensis* was also observed.

Figure 25: Podarcis ionicus (female) on Atokos Island.

Figure 26: Podarcis ionicus (male) on Atokos Island.

Figure 27: Algyroides nigropunctatus kephallithacius on Atokos Island (photo by Apostolos Christopoulos).

Figure 28: Itaka Island.

On Itaka (Fig. 20), where we stopped only to spend the night, *Tarentola mauritanica* and *Hemidactylus turcicus* were observed. The first under a stone while the latter on a wall.

Figure 29: Island of Kythros

Kythros island was visited on May 7. Only the presence of *Lacerta trilineata* was known for the island of Kythros. During this Mission PIM, two other species, *Algyroides nigropunctatus* and *Mediodactylus kotschyi* (Figs 30-31), were observed and the presence of *Lacerta trilineata* (Fig. 32) confirmed. The number of reptile species present on Kythros thus increases from one to three species.

Figure 30: Mediodactylus kotschyi on Kythros Island (photo by Apostolos Christopoulos).

Figure 31: Algyroides nigropunctatus kephallithacius on Kythros Island (photo by Apostolos Christopoulos).

Figure 32: Lacerta trilineata on Kythros Island (photo by Apostolos Christopoulos).

Figure 33: Kalamos Island. From Google Earth 2023.

For the island of Kalamos (Fig. 33), briefly visited for the second time in the late afternoon, the following five species of reptiles are known *Mediodactylus kotschyi, Algyroides nigropunctatus, Lacerta trilineata, Elaphe quatuorlineata, Platyceps najadum.* During this brief stop it was only possible to confirm the presence *Platyceps najadum* (Fig. 34). However, thanks to the visit carried out on May 5, it is possible to add the Turkish Gecko, *Hemidactylus turcicus*, to the list of reptiles of this island, which has increased from five to six species. (Fig. 35).

Figure 34: Platyceps najadum, Kalamos island (photo by Nikolaos Manolas).

Figure 35: Hemidactylus turcicus, Kalamos island (photo by Apostolos Christopoulos).

Disucssion

Among the islands visited during this Mission PIM there are some for which the presence of reptiles was detected for the first time, others were instead found to be devoid of herpetofauna (such as Provati Kastou Island and the west-southwest islet of Prasonisi), while for others the list of species has been enriched (Table 1).

Thanks to the observations made during this Mission PIM, the Ionian wall lizard (*Podarcis ionicus*) is reported for the first time for both the Large Formikoula and the South-East Formikoula Islet. This species has also been observed on Atokos for which, however, it was already known. *Podarcis ionicus* is endemic to the eastern Ionian area and is distributed in southern Albania, western Greece, the Ionian Islands, and Peloponnese (Valakos et al., 2008; Psonis et al., 2017, 2018, 2021).

The herpetofauna of the island of Prasonisi is also reported here for the first time. Two species have been observed, the Kotschy's gecko (*Mediodactylus kotschi*) and the Balkan green lizard (*Lacerta trilineata*), both species appear to be well distributed on this island. Both are widespread in Greece.

Algyroides nigropunctatus, a lacertid lizard distributed along the eastern Adriatic coast to western Greece and the Ionian Islands, and *Mediodactylus kotschyi*, a gecko distributed in the eastern Mediterranean area, were recorded for the first time during this Mission PIM on the Island of Kythros where only the Balkan green lizard was known to live.

With the Turkish gecko, *Hemidactylus turcicus*, also the list of reptiles of the island of Kalamos has been enriched.

Table 1: List of Islands for which new data are available after the Mission PIM – Greece 2023.

Island	***Species***	***PIM Mission***
Large Formikoula	*Podarcis ionicus.*	First time record
South-East Formikoula	*Podarcis ionicus.*	First time record
Kalamos Island	*Hemidactylus turcicus, Mediodactylus kotschyi, Algyroides nigropunctatus, Lacerta trilineata, Elaphe quatuorlineata, Platyceps najadum.*	*Hemidactylus turcicus* recorded for the first time for the island
Prasonisi	*Mediodactylus kotschyi, Lacerta trilineata.*	First time record
WSW Islet of Prasonisi	----	No species of herpetofauna found
Provati Kastou	----	No species of herpetofauna found
Kythros	*Mediodactylus kotschyi, Algyroides nigropunctatus, Lacerta trilineata.*	*Mediodactylus kotschyi* and *Algyroides nigropunctatus were* recorded for the first time for the island

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Introduction

The inner Ionian archipelago consists of multiple small rocky islands layinng between Lefkada, Kephallonia and the mainland Greece. Very little taxonomical research has been conducted on these islets in the past leaving a big gap in our knowledge of these islands' biodiversity. During this expedition, a total of 14 different islets were researched for invertebrates, while collection was also performed in Mitikas (Etolokarnania), Preveza town (Epirus) and Lefkada town (Ionian islands). The collected material plays an important role by helping us fillings those gaps in the knowledge of biodiversity, zoogeography and even taxonomy of the invertebrate fauna of western Greece.

Methods

Invertebrates were collected using 3 main methods: collection with aspirator or pincer, net sweeping and collection from substrate. Ground-dwelling invertebrates were collected using an aspirator or pincer, flying insects like Hymenoptera. Orthoptera and Diptera were collected with net sweeping and microinvertebrates like Collembola, Acariformes and microgastropoda were collected from substrate samples. For the collection of substrate samples, a knife was used to gently dig the ground, then the loose soil was collected by hand and sealed in zip-bags. At least one substrate specimen was collected from every visited island. Traps like pitfall, yellow pan and flight interception traps were not used because we didn't revisited any of the collection sites.

Most of the collected specimens were killed and preserved in ethanol (95o) by simply submerging the specimen in the liquid. Ethanol injections were performed in some specimens (like slugs) to preserve their internal structure. Some insects (bees, Orthoptera and Lepidoptera) were firstly killed in a freezer, fixed in position using needles and then preserved by drying the specimen. Specimens that have been already dead like empty mollusc shells or bones collected accidentally with the substrate samples were simply stored without any drying or ethanol submerging.

The soil samples were only examined after the expedition was over. The samples were shieved using a 2mm shieve and an additional 1mm shieve for the freshwater substrate samples from Lefkada island. The samples were then puted in a white bowl and each animal specimen was collected individually using a pincer. Again, all the living microinvertebrates were killed and preserved in ethanol while already dead specimens found in the samples were simply stored. The soil samples were then stored for possible future research.


Figure 36: Nikolas Manolas collecting samples on Petalou

Results

In total, specimens were collected from 8 major taxonomic groups as presented below.

Annelida

Annelids were found in 6 different islands. All of them were terrestrial species except the two found in a river near Lefkada town (one Hirundinea and one unidentified sp.). From Prasonisi and the islet near Formicoula only Enchytraeidae were found, while on Provati one Enchytraeidae and one unidentified species were collected. Further idenitifications have not been conducted yet.

Collembola

Springtails (Collembola) were obtained from soil samples from 8 different islets.

Chelicerata

- **Acariformes-Pseudoscorpiones**
  Soil mites were found in soil samples from 5 different islets and from the small cave near Mitikas (Etolokarnania), while Pseudoscorpions from only 2 islands (Formicoula and Kythros). In Kythros however 2 false-scorpion morphospecies were found, one from the base of the cliff on the northern side of the island and another from the island's small cave (together with a mite species).

Figura 1:Pseudoscorpiones from the Kythros cave (c) N.Manolas

- **Araneae**
  Spider species were found in 12 different localities. The species are the following:

  Alopecosa cf.albofasciata (one female) from Preveza.

Araneus angulatus from Kalamos, Kythros and Provati.
Araneus circe from Atokos.
cfr.Anagraphis sp. from Kalamos.
cfr.Neoscona subfusca from Mitikas.
cfr.Steatoda triangulosa (juveniles) from Formicoula.
Cyrba algerina from Alafonisi, Atokos, Kalamos and Provati.
Cyrtocarenum cunicularium from Alafonisi, Kalamos and Kythros.
Habrocestum sp. from Atokos.
Haplodrassus sp. from Alafonisi and Kalamos.
Hasarius adansoni from Kalamos.
Hogna graeca from Provati.
Hogna radiata from Meganisi.
Kochiura aulica from Alafonisi.
Leptorchestes sp. from Provati.
Loxosceles rufescens from Formicoula and Kalamos.
Lycosidae from Alafonisi and Kythros.
Maimuna vestita from Alafonisi,
Neoscona adianta from the islet near Formicoula.
Ozyptila sanctuaria from Provati.
Palpimanus gibbulus from Alafonisi,
Philaeus chrysops from Alafonisi, Kalamos, Kythros and Provati.
Runcinia grammica from Kalamos.
Saitis sp. from Kalamos.
Scytodes thoracica from Alafonisi.
Tetragnatha extensa from Lefkada.
Thomisus onustus (one male) from Lefkada.
Xysticus kochi from Alafonisi.
Zelotes sp. from Provati.
And not yet identified specimens from Alafonisi, Atokos, Formicoula, islet near Formicoula, Kalamos, Kythros, Mitikas, islet near Kastos and Provati.

Figura 2:Alopecosa cf.albofasciata female from Preveza (c) N.Manolas

- **Opiliones**
  Opiliones were only found in Preveza (*Rafalskia sp.*, one individual) and Kalamos both in the beach visited at 05/05 (one Opilionidae, maybe *Opilio sp.*) and the trail visited at 07/05 (*Rafalskia sp.*, *Mediostoma sp.* and an unidentified species).

- **Scorpiones**

Only two scorpion species were found during the expetition, in two different islands. The common *Aegeobuthus gibbosus* was found in Kythros while the Ionian endemic *Euscorpius cf.corcyraeus* in Kalamos.

Diplura

2 Diplura species were found during the expedition, both from soil sample from Formicoula island (one Campodeidae and one Japygidae).

Insecta

- **Archaeognatha**

  Two Archaeognatha specimens were collected from the island of Kalamos and Mitikas, but unfortunately both of the specimens were purely preserved and thus identification of them is not possible.

- **Coleoptera**

The Coleoptera taxa found during the expedition are the following:

Alaeocharinae from Kythros.
Amara sp. from Lefkada.
Anobiinae from Kythros.
Anthicinae from Kythros and Lefkada.
Blaps sp. from the small caves in Kythros and Mitikas.
Bruchinae from Lefkada.
Carabus (Tomocarabus) convexus from Kalamos.
Cephennium sp. from Kalamos.
Ceutorrhynchus sp. from the islet near Formicoula.
cfr.Amphimallon sp. from Mitikas.
cfr.Cetonia aurata from Kalamos.
cfr.Hymenalia sp. from Kythros and Provati.
cfr.Hymenorus sp. from Prasonisi
cfr.Raiboscelis sp. from Provati.
cfr.Rhagonycha sp. from Kalamos,
cfr.Tropinota squalida from Meganisi.
cfr.Xantholinini from Provati.
Clanoptilus sp. from Kythros.
Coccinella septempunctata from Lefkada.
Cryptocephalinae (fecal cases) from Kythros, Lefkada and Prasonisi.
Cryptocephalus (Burlinius) sp. from the islet near Formicoula.
Dasytes sp. From Formicoula, Lefkada and Meganisi.
Dasytinae from Meganisi and Provati.
Dermestidae (pupas) from Mitikas.
Dinodes cruralis from Mitikas.
Histeridae from Lefkada.
Hymenalia sp. from Kythros and Prasonisi.
Hypebaeus flavicollis (female) from Preveza.
Jekelius (Jekelius) brullei brullei from Kalamos and Provati.
Lagria sp. from Kalamos and Meganisi.
Luciola lusitanica (male) from Mitikas.
Macrolenes dentipes from Kythros.
Nephus sp. from Kythros.
Nyctophilidae (larva) from Meganisi.
Ochthebius sp. from the islet near Formicoula.
Oedemera (Oedemera) flavipes from Kalamos, Kythros, Meganisi and Provati.
Oedemera rufofemorata rufofemorata from Formicoula, islet near Formicoula, Kalamos and Prasonisi.

Omophlus sp. from Meganisi, Preveza and Provati.
Otiorhynchus cf.lugens from Kythros and Preveza.
Otiorynchus lugens from the islet near Formicoula.
Pedinus sp. from Kalamos and Provati.
Polydrusus sp. from Alafonisi and Meganisi.
Raiboscelis azureus from Alafonisi.
ssp. from Atokos, Formicoula, islet near Formicoula, Kalamos, Kythros, Lefkada, Mitikas, Prasonisi and Provati.
Stenopterus rufus from Provati.
Stenosis sp. from Kythros.
Stromphomorhus sp. from Lefkada.
Tenebrionidae (larva) from Prasonisi.

Figura 3: Raiboscelis azureus from Alafonisi (c) N. Manolas

- **Dermaptera**
  Only one earwig species was found (in the small islet near Formicoula) and unfortunately only dead females were obtained so a secure identification is not possible. From comparing the preserved pincers with the other greek genera, resemblance was found with *Chelidura*, a genus with only one species in Greece, endemic to mount Chelmos.

- **Dictyoptera**
  Two Dictyoptera species (the common cockroach *Loboptera decipiens decipiens* and the endemic subterranean termite *Reticulitermes urbis*) seemed to be very common as they were found in many different islets. Two other Dictyoptera were collected during the expedition, one *Ectobius sp.* from Provati and *Ameles spallanzania* from Alafonisi (from the later only two old oothecas were found).

- **Diptera**
  The Diptera taxa found during the expedition are the following:
  Bombyliidae from Provati.
  Calliphora sp. from Prasonisi.
  Cecidomyiidae from Alafonisi, islet near Formicoula, Kythros, Mitikas and Provati.
  Chironomidae (larvae) from Lefkada.
  Chloromyia sp. from Kythros and Meganisi.

Dolichopeza sp. from Preveza.
Drosophila sp. from the islet near Formicoula, Kalamos and Kythros.
Episyrphus balteatus from Formicoula.
Fannia sp. from Kythros.
Nephrotoma sp. from Meganisi and Preveza.
Psychodidae from Lefkada.
Sargus bipunctatus from Meganisi.
Tephritidae from the islet near Formicoula, Kythros and Meganisi.
Tipula ssp. from Alafonisi, Atokos, Kioni and Preveza.
Stratiomyidae from Kythros.
And not yet identified specimens from Atokos, islet near Formicoula, Kalamos, Kythros, Meganisi, Mitikas and Provati.

Figura 4:Papilio alexanor from Meganisi (c) N. Manolas

- **Embioptera**
  Only one Embioptera was collected during the expedition, a female *Haploembia solieri*, common in western Greece, from the small islet near Kastos.

- **Hemiptera**
  Hemiptera species were found in 10 different localities. The species are the following:
  Aphididae from the islet near Formicoula, Kalamos, Kythros and Lefkada.
  cfr.Eulachnus sp. from Kythos.
  cfr.Gonocerus insidiator (only nymphs) from Provati.
  Closterotomus cf.annulus from Lefkada and Meganisi.
  Closterotomus trivialis (one female) from Preveza.
  Membracoidea from the islet near Formicoula, Kalamos, Kythros and Lefkada.
  Micrelytra fossularum from Alafonisi.
  Phytocoris sp. from Kioni and Meganisi.
  Rhynocoris rubricus from Kythros.
  Scantius aegyptius from Meganisi.
  ssp. from Formicoula, Kythros and Provati.
  Trioza sp. from the islet near Formicoula.
  And not yet identified specimens from Alafonisi, Kalamos, Kythros, Lefkada, Meganisi,

- **Hymenoptera**
  Formicidae species were found on every collection site with many morphospecies being present on many different islands. On the other hand winged Hymenoptera were present in 6 islets and Preveza. The identification of the Hymenoptera specimens is still ongoing.

- **Lepidoptera**
  Many different Lepidoptera species were found from 10 localities. From butterflies the common *Euchloe ausonia*, *Maniola jurtina* and the cryptic *Papilio alexanor* was found in Meganisi and a *Thymelicus sp.* in Kythros which was very common in the island. As for moths, *Ophiusa tirhaca* was found in the islet near Formicoula, *Lasiocampa trifolii* and a *Leucania sp.* (only weathered wings inside a small cave) in Kythros, *Eilema caniola* in Lefkada and Preveza towns, *Lymantria dispar* in Meganisi (in a *Quercus coccifera* tree), *Symmoca attalica* in the small cave near Mitikas, *Euproctis chrysorrhoea* (larvae) in the small islet near Kastos and *Oulobophora externaria* in Preveza town.

Figura 5: Euchloe ausonia from Meganisi (c) N.Manolas

- **Neuroptera**
  The most common Neuroptera found in the expedition was the family Chrysopidae, found in Alafonisi, Formicoula, Kioni (Ithaca) and Preveza. The species *Distoleon tetragrammicus* was found in Alafonisi as well, and a *Libelloides sp.* from Kythros. Although the latter was very common in the island we were not able to collect or photograph any specimen.

Figura 6: Distoleon tetragrammicus from Alafonisi (c) N.Manolas

- **Orthoptera**
  Orthoptera were found in 8 different localities, with common taxa being the genera *Eupholidoptera* and *Poecilimon*, as well as *Calliptamus*. Unfortunatelly during the time of the expedition very few adult specimens were found and most of the specimens observed and collected were still nymphs.

Other taxa found were *Chorthippus biguttulus biguttulus* from Alafonisi, a *Myrmecophilus sp.* (nymph) from Formicoula, *Acrometopa servillea macropoda* from Meganisi and an unidentified grasshopper from Provati.

- **Psocoptera**
  An *Ectopsocus petersi* specimen was collected from Lefkada island, in a small field near the researched river. It is only the second record of this species from Greece, the first one being from the island of Corfu.

Figura 7: Ectopsocus petersi from Lefkada (c) N.Manolas

- **Raphidioptera**
  Only one Raphidioptera specimens was found, near the researched river in Lefkada.

- **Zygentoma**
  Zygentoma were found from 9 different islands, with the most common species being *Allacrotelsa kraepelini*. Other species found were *Tricholepisma gyriniformis* from Atokos, *Ctenolepisma ciliata* from Kalamos and Provati, *Ctenolepisma lineata* from the Lefkada's marina, *Proatelurina pseudolepisma* from Meganisi and a *Ctenolepisma sp.* from the small islet near Kastos.

Isopoda

A total of 18 different isopoda species were found in nearly all of the visited localities, with the most common being the endemic *Armadillidium arcadicum*, present in nearly all of the localities followed by the cosmopolitan *Porcellionides pruinosus*. Other species found are:

Agabiformius lentus found in the islet near Formicoula, Meganisi and Preveza.
Armadillidium beieri from Kythros, known from Kephallonia, Lefkada and Kalamos islands.
Armadillidium frontemarginatum, a species endemic to the Ionian, found in Meganisi.
Armadillidium granulatum found in Meganisi and Preveza.
Armadillidium marmoratum from Provati.
Armadillidium vulgare, a cosmopolitan species found in Alafonisi, Meganisi and Mitikas.
An unidentified Armadillidium sp. from Mitikas which has been compared with every species known from the region but it's morphological characteristics are different from all of them.
Asellidae, a family of aquatic isopods, found in the river near Lefkada city.
Chaetophiloscia cellaria from Prasonisi.
Chaetophiloscia elongata from the islet near Kastos.
Chaetophiloscia leucadia, a species endemic to the Ionian islands, found in Formicoula and Meganisi.

Ligia italica, a halophilous species common thoughout Greece, found in Kythros and the Lefkada's marina.
Orthometopon dalmatinum, a common species in western Greece, found in Formicoula and Provati.
Platyarthrus cf.werneri, a myrmecophilous species living inside ant nests, found in Atokos.
Porcellio achilleionensis, a species endemic to western Greece, found in Kalamos.
Porcellio lamellatus, a species living in close vicinity to the sea, found in Formicoula, the islet near Formicoula and the islet near Kastos.
Stenophiloscia glarearum, a halophilus species found in a beach in Alafonisi.
Trachelipus palustris found in Meganisi.

Figura 8: Chaetophiloscia leucadia from Meganisi (c) N.Manolas

Mollusca

The mollusca taxa found during the expedition are the following:

Aciculidae from Kythros (4 species of the family are found in western Greece and the specimens from Kythros seem to be different from all of them).
Albinaria contaminata florisi from Atokos (endemic to the island, described in 2015).
Albinaria contaminata muraria from Kalamos.
Albinaria contaminata ssp. from Kythros and Mitikas.
Albinaria leonedani from Prasonisi and Provati (a species that was described in 2015 from the nearby island of Kastos. These are the second and third localities where the species has been found).
Albinaria scopulosa ssp. from Mitikas.
Albinaria senilis ssp. from Alafonisi, Kythros, Lefkada and Meganisi.
Allaegopis ionicus from Kalamos and Mitikas.
Ancylus recurvus from Lefkada.
Ancylus striatus from Lefkada.
Bithynia hellenica from Lefkada.
Caracolina lenticula from Kalamos.
Carychium hellenicum from Lefkada.
Cecillioides acicula from Kythros and Mitikas.
Cecillioides janni from Prasonisi.
Cecillioides sp. from Kalamos.
Cecillioides tumulorum from Lefkada.
Cernuella sp. (juveniles) from Meganisi and Mitikas.
Cernuella virgata from Kalamos, Lefkada and Provati.
cfr.Pseudamnicola sp. from Lefkada (according to Schütt 1980, *Pseudamnicola macrostoma* which was described from Athens inhabits the island. Back then it was believed that the Greek hydrobiidae species were much more widespread, but the more recent discoveries of narrow-endemic species has proven this theory wrong. Schütt provides no description of the Lefkada's specimens so we can not be sure whether the specimens collected during the expedition belong in the same species).

Chondrina arcadica from Kythros.
Chondrus zebrula from Kalamos.
Cochlicella acuta from Lefkada.
Cochlicella barbara from Preveza.
Cochlostoma tesselatum ssp. from Alafonisi, Atokos, Formicoula, Kalamos, Kythros, Meganisi, Mitikas, Prasonisi, islet near Kastos and Provati.
Cornu aspersum from Lefkada, Meganisi and Preveza.
Eobania vermiculata from Lefkada and Preveza.
Ferussacia folliculum from Lefkada.
Granopupa granum from Kythros and Prasonisi.
Helix borealis from Mitikas.
Helix figulina from Mitikas.
Hypnophila zacynthia from Kioni, Kythros, Meganisi and Mitikas.
Limacus flavus from Lefkada.
Limacus sp. from Kioni (Wiktor mentions *Limax cephallonicus* from Ithaca, but the given locality, Vathi, a seaside town, seems to be a not suitable habitat for this high mountain species. Furthermore *L.cephallonicus* has no pattern on the mantle. It is suspected that the Kioni specimen belongs to *Limacus maculatus* which from Greece is only known from Macedonia, further research is needed in the specimen).
Limax conemenosi from Kalamos and Mitikas.
Lindholmiola corcyrensis from Alafonisi, Kalamos, Kythros, Lefkada, Meganisi and Mitikas.
Lindholmiola lens from the islet near Kastos and Provati.
Mastus cf.grandis from the islet near Formicoula and Prasonisi.
Mastus grandis from Alafonisi, Formicoula and Mitikas.
Mediterranea ionica from Kythros, Mitikas, Prasonisi and Provati.
Microxeromagna loweii from Kythros.
Monacha claustralis from Lefkada, Meganisi and Preveza.
Monacha parumcincta from Alafonisi, Formicoula, islet near Formicoula, Kythros, Meganisi, Mitikas, Prasonisi, Preveza and Provati.
Myosotella myosotis from Alafonisi and Lefkada.
Papillifera papillaris papillaris from Lefkada, Meganisi and Preveza.
Physa acuta from Lefkada.
Pisidium sp. from Lefkada.
Planorbis atticus from Lefkada.
Poiretia compressa from Atokos, Kalamos, Kythros, Mitikas, Prasonisi, Preveza and Provati.
Pomatias elegans from Atokos, Kythros, Mitikas and Provati.
Rupestrella philippii from Provati.
Rupestrella rhodia from Kythros and Mitikas.
Schistophallus cyprius from Lefkada and Meganisi.
Stigmatica stigmatica ssp. from Formicoula.
Stigmatica stigmatica stigmatica from Kalamos and the islet near Kastos.
Stigmatica stigmatica sturmii from Alafonisi, Kythros, Lefkada and Meganisi.
Tandonia sowerbyi from Lefkada and Meganisi.
Tandonia sp. from Kythros and Mitikas.
Trochoidea pyramidata from Formicoula and the islet near Formicoula.
Truncatellina callicratis from Kythros and Prasonisi.
Truncatellina rothi from Atokos and Formicoula.
Tuncatella subcylindrica from Alafonisi and Lefkada.
Vitrea contracta from Kalamos.
Vitrea selecta from Atokos and Provati.
Vitrea subrimata from Prasonisi.
Xerotricha apicina from Mitikas.
Xerotricha conspurcata from Meganisi.

Figure 9: Albinaria senillis ssp. from Alafonisi (c) N.Manolas

Myriapoda

- **Chilopoda**
  Chilopods were found in 8 different islets. The species found are:

  Bothriogaster signata from Kalamos and Provati.
  Cryptops parisi from Kalamos, Kythros and Meganisi.
  Eupolybothrus littoralis from Meganisi.
  Geophilomorpha (juvenile) from Prasonisi.
  Lithobius cf.erythrocephalus from Formicoula (2 juveniles).
  Pachymerium ferrugineum from Alafonisi.
  Pleurolithobius jonicus from Meganisi.
  Scolopendra cingulata from Alafonisi, Atokos, Kalamos, Kythros, Meganisi and Prasonisi.
  Scutigera coleoptata from Formicoula.

- **Diplopoda**
  Diplopods species were found in 9 different localities:
  Chromatoiulus podabrus from Alafonisi, Kalamos and Meganisi.
  Diplopoda ssp. from Atokos, Kythros, Mitikas, Prasonisi and Provati.
  Megaphyllum sp. from Kalamos (either a new location for Megaphyllum leucadium, endemic to Lefkada, or a new species).
  Pachyiulus apfelbecki from Mitikas.
  Pachyiulus varius from Meganisi.
  Polyxenus cf.chalcidicus from Formicoula.
  Polyxenus cf.lagurus from Kythros.

Chordata

Although the research didn't aimed to the collection of chordata specimens, many remains from dead Chordatas were accidentaly collected with the substrate samples. For the sake of completeness we will mention them too.

Bones (quadrate and pelvis vertebrae) from the sea gull *Larus michachelis* were found in the small islet near Formicoula. On the same island a femur and an incissor of *Rattus rattus* were also collected from soil sample.
A small vertebra (2mm in diametre) was found in soil sample from Provati.
A lumbar and a thoracic vertebrae of a ruminant (possibly from *Ovier aries*) were found in a wall inside the small cave in Kythros.
Many bones were also found in the small cave in Mitikas. Most of them remain unidentified but they probably have mammalian origins. The two species that was possible to identify was *Rattus rattus* (many bones including a jaw, a pelvis and vertebrae) and *Mus musculus* (again a lot of material from bones and feces to seeds of *Olea europaea* with bite marks and holes)
Feces of black rats (*Rattus rattus*) were also observed in Alafonisi in very large numbers.

Figure 10: Mammal Vetebrae from the small cave in Kythros (c) N.Manolas

Sea Organisms
Just as with chordata, specimens from marine organisms were unintentionally collected, whether from soil samples or from the seashore while searching for halophilous terrestrial species. The species found will be presented sorted by island or location.

Alafonisi
- *Alvania cancellata*
- *Arca noae*
- *Barbatia barbata*
- *Bittium ratreilli*
- *Cardita calyculata*
- *Cerithium lividulum*
- *Cerithium vulgatum*
- *Chama sp.*
- *Clanculus corallinus*
- *Columbella rustica*
- *Conus ventricosus mediterraneus*
- Diogenidae
- *Euthria cornea*
- *Fissuria sp.*
- Gammaroidea
- *Gibbula philberti*
- *Gouldia minima*
- *Haliotis tuberculata lamellosa*

- *Hinia incrassata*
- *Hoplangia durotrix*
- *Lajonkairia lajonkairii*
- *Lithophaga lithophaga*
- *Melaraphe neritoides*
- *Mitra cornicula*
- *Mitromorpha cf.olivoidea*
- *Modiolus barbatus*
- *Ocenebra edwardsii*
- *Paracentrotus lividus*
- *Patella ulyssiponensis*
- *Phorcus mutabilis*
- *Phorcus richardi*
- *Phorcus turbinatus*
- *Pisania striata*
- *Pollia dorbignyi*
- *Rissoina bruguieri*
- Sparidae (jaw)
- *Steromphala adansonii*
- *Steromphala divaricata*
- *Steromphala umbilicaris*
- *Steromphala varia*
- *Striarca lactea*
- *Trimusculus mammillaris*
- *Venus verucossa*
- Vermetidae
- *Vermetus arenarius*
- *Vexillum ebenus*

Formicoula

- *Barbatia barbata*
- *Cerithium vulgatum*
- Actinopterygii (jaw)
- *Eriphia verucossa*
- *Euthria cornea*
- *Hexaplex trunculus*
- *Patella rustica*
- *Pecten jacobaeus*
- *Phorcus mutabilis*
- *Phorcus turbinatus*
- *Spondylus gaederopus*
- *Steromphala varia*
- *Tonna galea*

Islet near Formicoula

- Actinopterygii (jaw and vertebra)
- *Melaraphe neritoides* (from soil sample)
- *Mytilus galloprovincinalis* (from soil sample)\

Islet near Kastos

- Echinoidea
- Gastropoda (from soil sample)
- *Turbo sp.* juvenile (from soil sample)

Kalamos

- Actinopterygii (three juveniles)
- *Amphibalanus amphrite*
- *Amphibalanus sp.*
- *Amphistegina lobifera*
- *Arbacia lixula*
- *Hexaplex trunculus*
- *Modiolus barbatus*
- *Musculus discors*
- *Myriapora truncata*
- *Mytillus galloprovincinalis*
- *Ostrea edulis*
- *Pinctata radiata*
- *Polychaeta*
- *Ruditapes decussatus*

Lefkada lagoon

- *Amphibalanus sp.*
- *Atys jeffreysi*
- *Cerastoderma edule*
- *Cerithium lividulum*
- *Cerithium vulgatum*
- *Conus ventricosus mediterraneus*
- *Ecrobia sp.*
- *Gibbula adansoni*
- *Hexaplex trunculus*
- *Jassa marmorata*
- *Loripes orbiculatus*
- *Modiolus barbatus*
- *Muricopsis cristata*
- *Mytilaster solidus*
- *Mytilus sp.*
- *Parvicardium exiguum*
- *Phorcus articulatus*
- *Pirenella conica*
- *Rissoa ventricosa*
- *Scrobicularia cottardii*
- *Tricolia speciosa*
- *Tritia corniculum*
- *Tritia cuvierii*
- *Tritia incrassata*
- *Tritia neritea*

Meganisi

- *Haliotis tuberculata lamellosa*
- *Lithophaga lithophaga*
- *Venus verucossa*

Mitikas

- unidentified mollusc shell fragment from the small cave

Prasonisi

- *Amphibalanus sp.*
- *Barbatia barbata*
- *Melaraphe neritoides*
- Thysanopoda

Preveza
- *Eriphia verucossa*
- *Mytilaster lineatus*

Provati
- Unidentified Eucarida (maybe *Meganyctiphanes norvegica*)

Discussion

As mentioned in the introduction because of the very little research that has ever been conducted in the inner Ionian islets, the specimens collected during the expedition play a very important role not only zoogeographically but also taxonomically. Many of the collected specimens are still under identification process but the first results seem to be quite interesting. Not only new localities for both widespread and endemic species were discovered, but specimens that show a great taxonomic interest were also collected from many of the researched localities. Unfortunately though the collected material of some taxa found (like Archaeognatha or Dermaptera) consist only of specimens that can not be identified. In order to get a complete view of the inner Ionian islets invertebrate fauna, more research should be conducted in the future not only on the islets not visited by this expedition (like Arkoudi or Kastos) but on the already researched islets too.

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Introduction

The Ionian Islands complex constitutes an insular area of significant ecological and environmental value, which is confirmed by the designation of 19 NATURA 2000 Sites of Community Importance (SCIs) and Special Protection Areas (SPAs) according to Directives 92/43/EC and 2009/147/EC respectively (**Figure 1**). It is worthwhile to mention that this island complex hosts the National Marine Park of Zakynthos (NMPZ) and the National Park of Mountain Ainos in Kefalonia, as well as 11 Wildlife Refuges and 98 wetlands that cover a total area of 2.250 ha. The Ionian Islands lie along the eastern route of the Palearctic-African migration system which is characterized by huge numbers of birds travelling between Europe and Africa, twice each year (Hahn et al., 2009). Consequently, remote islets such as the Strofades in the Ionian Sea constitute bottleneck sites of high importance for migratory birds every spring, and ensure their resting and refuelling (Barboutis et al., 2022).

The Inner Ionian Sea hosts tens of islands and islets (e.g. Echinades Isl.) where a gap of adequate knowledge regarding avifauna still exists. Even if long-term systematic census efforts have been carried out on adjacent wetland ecosystems (Lefkada Bay, Messolonghi Lagoon, Amvrakikos Gulf and Kalamas Delta) about waterbirds (Handrinos et al., 2015), there is no complete knowledge about the possible existence of seabird and in general waterbird colonies in the Inner Ionian Sea. Consequently, the aim of the current study was the census of seabirds and waterbirds in the Inner Ionian Sea and the identification of relevant species colonies.

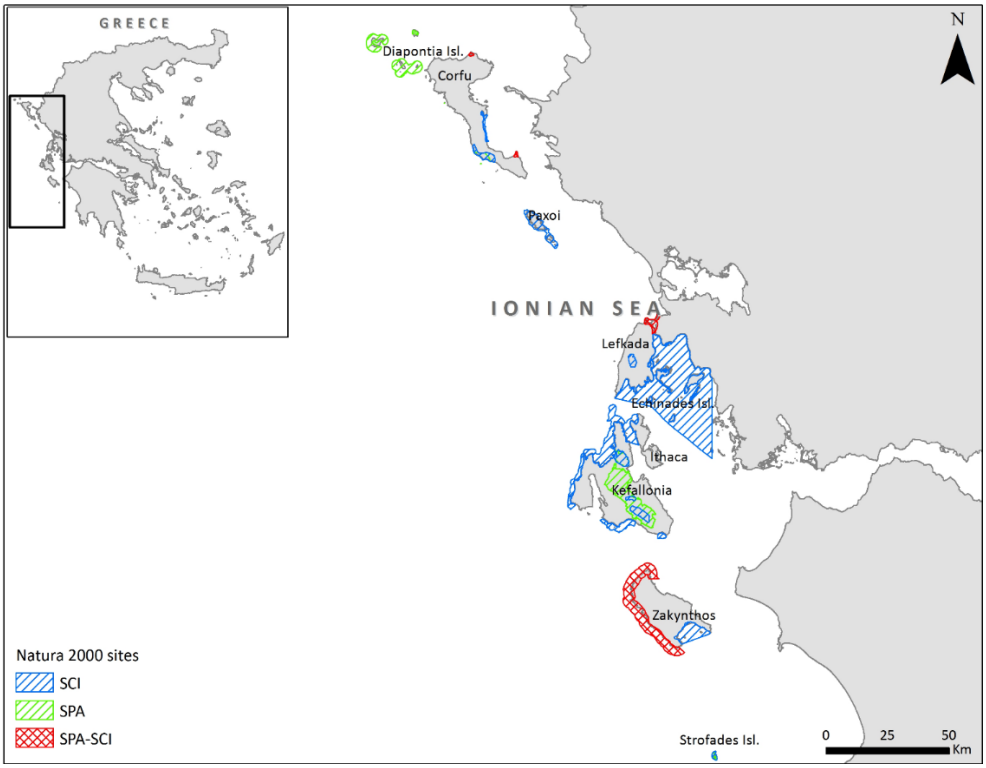

Figure 1. *The study area of Inner Ionian Sea focused mainly on Islands and islets between Lefkada, Ithaca and Mainland Greece, belongs to the wider insular area of the Ionian Islands complex. Locations of local NATURA 2000 sites are also shown.*

Methodology

Data for seabird species were collected during a systematic on-board survey around islands and islets by using the general guidelines of the ESAS (European Seabirds at Sea) recording methodology (Fric et al., 2012). The surveys were carried out on-board a catamaran operating from different ports in the Inner Ionian Sea with generally low speeds. Data collection including human activities at sea as well as marine litter was gathered by a fieldwork team of two observers during five consecutive days (4-8 May 2023). Two specific protocols (Seabird on-board observations, and general data about the surveys) were filled. Individuals of each species were identified using binoculars (10×50 magnification) while the position of each observation was stored in a portable GPS device. All on-board surveys were performed during calm to fresh breeze conditions (<6 Beaufort) so as to be able to check about seabirds e.g. rafts, foraging and breeding behavior, roosting places and between dawn and late afternoon.
Landing on specific islands and islets was also followed in order to collect data for the biodiversity of avifauna in general.

Results/Discussion

A total number of 42 bird species were observed during the expedition in the Inner Ionian Sea (**Table 1 & Table 2**). 11 birds are listed in Annex I according to BIRDS DIRECTIVE 2009/147/EC, namely Scopoli's Shearwater (*Calonectris diomedea*), Mediterranean Shag (*Gulosus aristotelis desmarestii*), Common Tern (*Sterna hirundo*), Little Tern (*Sternula albifrons*), Sandwich Tern (*Thalasseus sandvicensis*), Little Egret (*Egretta garzetta*), Wood Sandpiper (*Tringa glareola*), Eagle owl (*Bubo bubo*), Marsh Harrier (*Circus aeruginosus*), Eleonora's Falcon (*Falco eleonorae*) and Peregrine Falcon (*Falco peregrinus*). The majority of the species belonged to Passeriformes (17 species; 40.5%), followed by Charadriiformes (6 species; 14.3%), Pelecaniformes (3 species; 7.1%) and Falconiformes (3 species; 7.1%) (**Figure 2**).

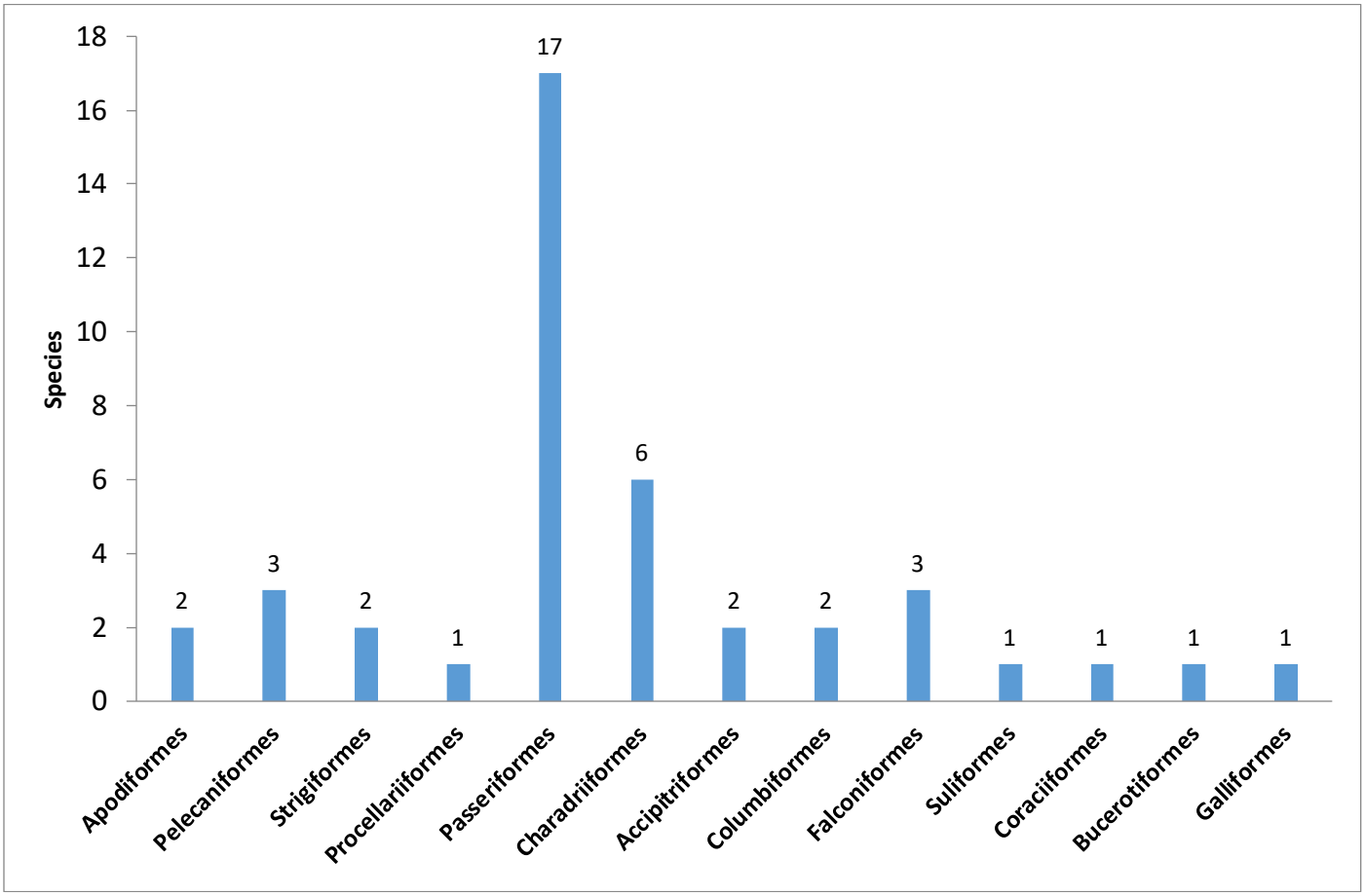

Figure 2. *Number of observed bird species per Order in the Inner Ionian Sea during 4-8 May 2023.*

In total, 7 seabird species were observed, namely Scopoli's Shearwater, Mediterranean Shag (Figure 3), Common Tern (Figure 4), Little Tern, Sandwich Tern, Yellow-legged Gull (*Larus michahellis*) (Figure 5) and Black-Headed Gull (*Chroicocephalus ridibundus*). It is assumed that all observed species of seabirds breed on the Ionian Islands but we found that only the Yellow-legged Gull (*Larus michahellis*) and the Mediterranean Shag breeding on islands and satellite islets of the study area. More specifcally, we have totally counted 1207-1237 inds of Yellow-legged Gulls and 98-101 of both adults and juveniles of Mediterrnean Shags in almost all the surveyed islands and islets (**Table 2**).

The Yellow-legged Gull seems to be the most dominant seabird while the most important colonies of the species were found on Agios Nikolaos Isl (500 inds) (Figure 6), Formikoula Isl (280 inds), Petalou Isl (130-150 inds), Kalamos Isl (77 inds) which is also characterised as foraging area due to the existence of aqua cultures, and Alafonisi (50-60 inds). In some cases Yellow-legged Gulls were also observed scavenging on fishery discards as it was also found in a recent study focused on the southern and central Ionian Sea (Karris et al., 2018a).

We have also observed the breeding behaviour of Mediterranean Shag on Formikoula Isl (26 inds) and Alafonisi (15-18 inds) where both adults and juveniles occurred (Figures 7 & 8). Additionally, we assumed that the study area is used by the pelagic Scopoli's Shearwater according to the off-shore sporadic observations of the species. We believe that the observed individuals could be originated from the huge Strofades colony in the southern Ionian Sea according to the species foraging dispersal pattern (Karris et al., 2018b; Karris et al., 2017). Nevertheless the current study highlights the urgent need to assess possible colonies of the nocturnal shearwaters at a regional scale by taking advantage of specific methodologies e.g. raft counts and surveys for apparently occupied sites.

The most significant findings regarding the other groups of birds are referred to:

- ✓ the new colony of Cattle Egret (*Bubulcus ibis*) on Agios Nikolaos Isl which is estimated at about 15-20 breeding pairs (Figure 9),

- ✓ the breeding of Zitting Cisticola (*Cisticola juncidis*) on Kithros Isl where the total species population is estimated at about 25-30 inds (Figure 10),
- ✓ the foraging behaviour of Marsh Harrier on Kithros Isl (Figure 11),
- ✓ the possible breeding of Eagle owl on Provati Isl according to the behaviour of an observed individual,
- ✓ the possible breeding of Peregrine Falcon on Atokos Isl according to the behaviour of an observed individual,
- ✓ the nesting site of about 60 Jackdaws (*Corvus monedula*) inside an abandoned castle at the Northwestern side of Kalamos Isl (Figure 12),
- ✓ the nesting site of Alpine Swift (*Tachymarptis melba*) in the Papanikolis Cave at the western part of Meganisi coastline where a total number of 100 inds were observed,
- ✓ the existence of a suitable nesting site for Bonelli's Eagle (*Aquila fasciata*) on Atokos Isl where an old nest of the latter species was found located at steep cliffs (Figure 13).

Table 1. *Birds species observed in the Inner Ionian Sea during 4-8 May 2023*

A/A	SCIENTIFIC NAME	COMMON NAME (ENGLISH)	COMMON NAME (GREEK)	ORDER	FAMILY	CONSERVATION STATUS DIRECTIVE 2009/147	CONSERVATION STATUS IUCN	PRESENCE IN GREECE
1	*Apus apus*	Swift	Σταχτάρα	APO	Apodidae		LC	SV
2	*Ardea cinerea*	Grey Heron	Σταχτοτσικνιάς	PEL	Ardeidae		LC	R,PM
3	*Bubo bubo*	Eagle owl	Μπούφος	STR	Strigidae	I	LC	R
4	*Bubulcus ibis*	Cattle Egret	Γελαδάρης	PEL	Ardeidae		LC	NBV, SV
5	*Buteo buteo*	Eurasian Buzzard	Γερακίνα	ACC	Accipitridae		LC	R, WV
6	*Calonectris diomedea*	Scopoli's Shearwater	Αρτέμης	PRO	Procellariidae	I	LC	SV
7	*Cettia cetti*	Cetti's Warbler	Ψευταηδόνι	PAS	Cettiidae		LC	R
8	*Chloris chloris*	European Greenfinch	Φλώρος	PAS	Fringillidae		LC	R, WV
9	*Chroicocephalus ridibundus*	Black-Headed Gull	Καστανοκέφαλος Γλάρος	CHA	Laridae	II/B	LC	WV, R
10	*Circus aeruginosus*	Marsh Harrier	Καλαμόκιρκος	ACC	Accipitridae	I	LC	WV, PM, R
11	*Cisticola juncidis*	Zitting Cisticola	Κιστικόλη	PAS	Cisticolidae		LC	R
12	*Columba livia*	Rock Dove, Feral Pigeon	Περιστέρι	COL	Columbidae	II/A	LC	R
13	*Corvus corone*	Carrion Crow	Κουρούνα	PAS	Corvidae	II/B	LC	R
14	*Corvus monedula*	Jackdaw	Κάργια	PAS	Corvidae	II/B	LC	R
15	*Cyanistes caeruleus*	Eurasian Blue Tit	Γαλαζοπαπαδίτσα	PAS	Paridae		LC	R
16	*Egretta garzetta*	Little Egret	Λευκοτσικνιάς	PEL	Ardeidae	I	LC	PM, R
17	*Falco eleonorae*	Eleonora's Falcon	Μαυροπετρίτης	FAL	Falconidae	I	LC	SV
18	*Falco peregrinus*	Peregrine Falcon	Πετρίτης	FAL	Falconidae	I	LC	R, WV
19	*Falco tinnunculus*	Common Kestrel	Βραχοκιρκίνεζο	FAL	Falconidae		LC	R
20	*Gulosus aristotelis desmarestii*	Mediterranean Shag	Θαλασσοκόρακας	SUL	Phalacrocoracidae	I	LC	R
21	*Hirundo rustica*	Barn Swallow	Σταβλοχελίδονο	PAS	Hirundinidae		LC	SV, PM
22	*Lanius senator*	Red-backed Shrike	Κοκκινοκεφαλάς	PAS	Laniidae		NT	SV, PM
23	*Larus michahellis*	Yellow-legged Gull	Ασημόγλαρος	CHA	Laridae	II/B	LC	R
24	*Merops apiaster*	European Bee-eater	Μελισσοφάγος	COR	Meropidae		LC	SV, PM
25	*Monticola solitarius*	Blue Rock Thrush	Γαλαζοκότσυφας	PAS	Muscicapidae		LC	R
26	*Muscicapa striata*	Spotted Flycatcher	Σταχτομυγοχάφτης	PAS	Muscicapidae		LC	PM, SV
27	*Oenanthe hispanica*	Black-eared Wheatear	Ασπροκωλίνα	PAS	Muscicapidae		LC	SV
28	*Otus scops*	Scops Owl	Γκιώνης	STR	Strigidae		LC	PLM
29	*Parus major*	Great Tit	Καλόγερος	PAS	Paridae		LC	R
30	*Phasianus colchicus*	Common Pheasant	Φασιανός	GAL	Phasianidae	II/A, III/A	LC	R
31	*Phylloscopus sibilatrix*	Wood Warbler	Δασοφυλλοσκόπος	PAS	Phylloscopidae		LC	PM, SV
32	*Pica pica*	Eurasian Magpie	Καρακάξα	PAS	Corvidae	II/B	LC	R
33	*Sterna hirundo*	Common Tern	Ποταμογλάρονο	CHA	Laridae	I	LC	SV, PM
34	*Sternula albifrons*	Little Tern	Νανογλάρονο	CHA	Laridae	I	LC	SV, PM
35	*Streptopelia decaocto*	Eurasian Collared-dove	Δεκαοχτούρα	COL	Columbidae	II/B	LC	R
36	*Sylvia cantillans*	Subalpine Warbler	Κοκκινοτσιροβάκος	PAS	Sylviidae		LC	SV, PM
37	*Sylvia melanocephala*	Sardinian Warbler	Μαυροτσιροβάκος	PAS	Sylviidae		LC	R
38	*Tachymarptis melba*	Alpine Swift	Βουνοσταχτάρα	APO	Apodidae		LC	SV, PM
39	*Thalasseus sandvicensis*	Sandwich Tern	Χειμωνογλάρονο	CHA	Laridae	I	LC	WV, PM, R
40	*Tringa glareola*	Wood Sandpiper	Λασπότρυγγας	CHA	Scolopacidae	I	LC	PM
41	*Turdus merula*	Eurasian Blackbird	Κότσυφας	PAS	Turdidae	II/B	LC	R, WV
42	*Upupa epops*	Hoopoe	Τσαλαπετεινός	BUC	Upupidae		LC	SV, PM

LEGEND

Birds Directive

DIRECTIVE 2009/147/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL OF 30 NOVEMBER 2009 ON THE CONSERVATION OF WILD BIRDS
Annex I: Species subject of special conservation measures concerning their habitat in order to ensure their survival and reproduction in their area of distribution
Annex II/A: Species which may be hunted in the geographical sea and land area where 2009/147/EC Directive applies.
Annex II/B: Species which may be hunted only in the Member States in respect of which they are indicated.
Annex III/A: Birds that have been legally killed or captured or otherwise legally acquired by the Members States.
Annex III/B: Birds that the Member States making provision for certain restrictions regarding their use

IUCN Red List

LC: Least Concern
NT: Near Threatened

Presence in Greece

INT: Introduced
NBV: Non breeding visitor
PLM: Partial Migrant (breeding)
PM: Passage Migrant
R: Resident
SV: Summer Visitor (breeding)
WV: Winter visitor

Order

ACC: Accipitriformes
APO: Apodiformes
BUC: Bucerotiformes
CHA: Charadriiformes
COL: Columbiformes
COR: Coraciiformes
FAL: Falconiformes
GAL: Galliformes
PAS: Passeriformes
PEL: Pelecaniformes
PRO: Procellariiformes
STR: Strigiformes
SUL: Suliformes

Table 2. *Birds species and population (individuals) observed per island/islet during 4-8 May 2023 in the Inner Ionian Sea*

SCIENTIFIC NAME	AGIOS NIKOLAOS ISL	ALAFONISI ISL & SATELITE ISL	MEGANISI ISL	PETALOU ISL	KITHROS ISL	FORMIKOULA ISL & SATELLITE ISL	KALAMOS ISL	PROVATI ISL	KASTOS ISL	PRASONISI ISL	ATOKOS ISL
Apus apus	-	-	15	-	12	-	1	-	-	-	-
Ardea cinerea	1	-	1	-	-	-	-	-	-	-	-
Bubo bubo	-	-	-	-	-	-	-	1	-	-	-
Bubulcus ibis	15	-	-	-	-	-	-	-	-	-	-
Buteo buteo	-	-	2	-	1	-	-	-	-	-	-
Calonectris diomedea	-	-	1	-	-	-	Presence	-	-	-	18
Cettia cetti	1	-	-	-	-	-	1	-	-	-	-
Chloris chloris	-	-	-	-	-	-	1	-	-	-	-
Chroicocephalus ridibundus	-	-	1	-	-	-	-	-	-	-	-
Circus aeruginosus	-	-	-	-	1-2	-	-	-	-	-	-
Cisticola juncidis	-	-	-	-	25-30	-	-	-	-	-	-
Columba livia	20	-	20	2	10	11	26	-	-	13	1
Corvus corone	-	-	17	-	-	3	4	2	-	3	-
Corvus monedula	25	9	37	-	1	2	121`	-	-	-	-
Cyanistes caeruleus	-	-	Presence	-	-	-	1	-	-	-	-
Egretta garzetta	-	-	-	-	-	-	1	-	-	-	-
Falco eleonorae	-	-	-	-	1	-	-	-	-	-	-
Falco peregrinus	-	-	-	-	-	-	-	-	-	-	1
Falco tinnunculus	-	-	1	-	2-3	-	6	1	-	-	-
Gulosus ar. desmarestii	2 (juv)	15-18 (ad & juv)	18	1	-	26 (ad & juv)	4	2	14 (6 ad & 8 juv)	11	5 (2 juv)
Hirundo rustica	-	-	33	-	3	-	-	-	-	-	-
Lanius senator	-	-	1	-	-	-	-	-	-	-	-
Larus michahellis	500 (Ad & Juv)	50-60	84	130-150	34	280	77	3	8	33	8
Merops apiaster	-	-	-	-	5	-	-	15	-	15	-
Monticola solitarius	1	-	-	-	-	-	-	-	-	-	3
Muscicapa striata	-	-	-	-	-	-	-	1	-	-	-
Oenanthe hispanica	-	-	-	-	-	-	-	2-3	-	-	-
Otus scops	-	-	-	-	-	-	1	-	-	-	-
Parus major	-	-	Presence	-	-	-	1	-	-	-	-
Phasianus colchicus	-	-	1	-	-	-	-	-	-	-	-
Phylloscopus sibilatrix	-	-	-	-	-	-	Presence	-	-	-	-
Pica pica	-	-	3	-	-	-	-	-	-	-	-
Sterna hirundo	-	3	1	-	-	-	-	-	-	-	-
Sternula albifrons	-	-	-	-	-	-	-	-	-	-	-
Streptopelia decaocto	-	-	2	-	-	-	-	-	-	-	-
Sylvia cantillans	-	-	-	-	-	-	-	-	-	-	Presence
Sylvia melanocephala	-	-	-	-	8	Presence	Presence	2	Presence	12-18	Presence
Tachymarptis melba	-	-	117	-	-	1	10	3	-	-	Presence
Thalasseus sandvicensis	-	-	-	-	-	-	1	-	-	-	-
Turdus merula	-	-	1	-	-	-	-	-	-	-	-
Tringa glareola	-	-	-	-	-	-	-	-	-	2	-
Upupa epops	-	-	-	-	-	-	1	-	-	-	-

LEGEND
ad: Adult
juv: Juvenile

Figure 3. Mediterranean Shag (*Gulosus aristotelis desmarestii*) foraging near Formikoula Isl.

Figure 4. Common Tern (*Sterna hirundo*) on Meganisi Isl.

Figure 5. Yellow-legged Gulls (*Larus michahellis*) on Formikoula Isl.

Figure 6. Yellow-legged Gulls (*Larus michahellis*) on Agios Nikolaos Isl.

Figure 7. 1st winter Mediterranean Shag (*Gulosus aristotelis desmarestii*) on Formikoula Isl.

Figure 8. A group of Mediterranean Shags foraging (*Gulosus aristotelis desmarestii*) adjacent to Alafonisi Isl.

Figure 9. Cattle Egrets (*Bubulcus ibis*) breeding on Agios Nikolaos Isl.

Figure 10. Zitting Cisticola (*Cisticola juncidis*) on Kithros Isl.

Figure 11. Marsh Harrier (*Circus aeruginosus*) foraging on Kithros Isl.

Figure 12. Jackdaws (*Corvus monedula*) breeders on Kalamos Isl.

Figure 13. Old nest of Bonelli's Eagle (*Aquila fasciata*) on Atokos Isl.

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Alexiou S. & Sfenthourakis S. (2013) THE TERRESTRIAL ISOPODS (ISOPODA: ONISCIDEA) OFGREECE. PARNASSIANA ARCHIVES 1: 3-50.

Assing V. & Meybohm H. (2021) On the Cephennium fauna of Greece (Coleoptera, Staphylinidae, Scydmaeninae). Linzer biol. Beitr. 52/2 869-889.

Barboutis, C., Navarrete, E., Karris, G., Xirouchakis, S., Fransson, T., Bounas, A. (2022). Arriving depleted after crossing of the Mediterranean: obligatory stopover patterns underline the importance of Mediterranean islands for migrating birds. *Animal Migration* 9: 27-36.

C., Cecchi L., Thévenet M. & Delaugerre M.J. (2022). Reptiles and micro-insular environments of the Tuscan Archipelago (Italy). Il Naturalista Siciliano, S.IV, XLVI(1): 111-116.

Condé B. & Nguyen Duy M. (1971) PÉNICILLATES D'ISRAËL RASSEMBLÉS PAR G. LEVY. BULLETIN DU MUSÉUM NATIONAL D'HISTOIRE NATURELLE 2e Série — Tome 42 — N° 6, pp. 1251-1258.

CRUMP M.L., SCOTT N.J.JR., (1994). Visual encounter surveys. Pp. 84-92. In: Heyer et al., Measuring and monitoring biological diversity. Standard methods for Amphibians. Smithsonian Institution Press, Washington and London, 364 pp.

de Jong, Y. et al. (2014) Fauna Europaea - all European animal species on the web. Biodiversity Data Journal 2: e4034. doi: 10.3897/BDJ.2.e4034.

Fet V. et al. (2018) Fauna and Zoogeographyof Scorpions in Greece. In: Sfenthourakis S., Pafilis P.,Parmakelis A., Poulakakis N. & Triantis K.A. (Eds) Biogeography and biodiversity of the Aegean. In honour of Prof. Moysis Mylonas, Broken Hill Publishers Ltd, Nicosia, Cyprus, p. 123–134.

Fric J., Portolou D., Manolopoulos A., Kastritis T. (2012). Important Areas for Seabirds in Greece. LIFE07 NAT/ GR/000285 – Hellenic Ornithological Society (HOS / BirdLife Greece), Athens, 208 pp.

Georgiev D. & Ivanova V. (2018) STUDY ON THE PSOCOPTERA FAUNAOF CORFU (KERKYRA) ISLAND, GREECE. Parnassiana Archives 6: 55-62 www.wildgreeceeditions.com/parnassiana archives ISSN (print-edition) : 2241-7834ISSN (on-line edition) : 2241-784255.

Ghesini S. & Marini M. (2015) Description of a new termite species from Cyprus and the Aegean area: Reticulitermes aegeus sp. nov. Bulletin of Insectology 68 (2): 207-210, ISSN 1721-8861.

Gittenberger E. (2015) Sailing for snails in the Ionian Islands (Pulmonata, Clausiliidae, Albinaria). Basteria 79 (4-6): 99-102.

Hahn S., Bauer S., Liechti F. (2009). The Natural Link between Europe and Africa: 2.1 Billion Birds on Migration. *Oikos* 118 (4): 624–626

Handrinos G., Kazantzidis S., Alivazatos, C., Akriotis, T., Portolou D. (2015). International Waterbird Census in Greece (1968-2006). Analysis of the populations of wildfowl (Anseriformes) and the Coot (*Fulica atra*). Hellenic Ornithological Society - Hellenic Bird Ringing Centre. Athens.

Karris G., Xirouchakis S., Grivas C., Voulgaris M.D., Sfenthourakis S., Giokas S. (2017). Estimating the population size of Scopoli's Shearwaters (Calonectris diomedea) frequenting the Strofades islands (Ionian Sea, western Greece) by raft counts and surveys of breeding pairs. *North-Western Journal of Zoology*, 13 (1): 101-108.

Karris G., Ketsilis‐Rinis V., Kalogeropoulou A., Xirouchakis S., Machias A., Maina I., Kavadas S. (2018a). The use of demersal trawling discards as a food source for two scavenging seabird species: a case study of an eastern Mediterranean oligotrophic marine ecosystem. *Avian Research*, 9:26.

Karris G., Xirouchakis S., Maina I., Grivas K., Kavadas S. (2018b). Home range and foraging habitat preference of Scopoli's Shearwater *Calonectris diomedea* during the early chick-rearing phase in the eastern Mediterranean. *Wildlife Biology*, wlb-00388

Lazányi E. et al. (2012) The millipede genus Megaphyllum Verhoeff, 1894 in the Balkan Peninsula, with description of new species (Myriapoda: Diplopoda: Julida: Julidae). Zootaxa 3228: 1–47 ISSN 1175-5326 (print edition) ISSN 1175-5334 (online edition).

Michael J.B. 1995, Spiders of Britain & Northern Europe. HarperCollins*Publishers.*

Montes E., Kraus F., Chergui B. & Pleguezuelos J.M., (2021**)** Collapse of the endemic lizard Podarcis pityusensis on the island of Ibiza mediated by an invasive snake. Current Zool., 1-9, doi: 10.1093/cz/zoab022

Nentwig W. et al. (2023) Spiders of Europe. Version {no. of month}. 2023. Online at https://www.araneae.nmbe.ch, accessed on {date of access}. https://doi.org/10.24436/1.

Psonis, N., Antoniou, A., Karameta, E., Darriba, D., Stamatakis, A., Lymberakis, P., & Poulakakis, N., 2021. The wall lizards of the Balkan peninsula: tackling questions at the interface of phylogenomics and population genomics. *Molecular Phylogenetics and Evolution*, 107121.

Psonis, N., Antoniou, A., Karameta, E., Leaché, A.D., Kotsakiozi, P., Darriba, D., Kozlov, A., Stamatakis, A., Poursanidis, D., Kukushkin, O., Jablonski, D., Crnobrnja-Isailovic´, J., Gherghel, I., Lymberakis, P., Poulakakis, N., 2018. Resolving complex phylogeo- graphic patterns in the Balkan Peninsula using closely related wall-lizard species as a model system. *Molecular Phylogenetics and Evolution*, 125: 100-115.

Psonis, N., Antoniou, A., Kukushkin, O., Jablonski, D., Petrov, B., Crnobrnja-Isailovic´, J., Sotiropoulos, K., Gherghel, I., Lymberakis, P., Poulakakis, N., 2017. Hidden diversity in the *Podarcis tauricus* (Sauria, Lacertidae) species subgroup in the light of multilocus phylogeny and species delimitation. *Molecular Phylogenetics and Evolution,* 106: 6-17.

Schütt, H. 1980. Zur Kenntnis griechischer Hydrobiiden. Arch. Moll. 110(4/6): 115-149.

Valakos E.D., Pafilis P., Sotiropoulos K., Lymberakis P., Maragou P., Foufopoulos J., 2008. The Amphibians and Reptiles of Greece. Edition Chimaira, Frankfurt am Main, Germany, 482 pp.

Welter-Schultes F. (2012) European non-marine molluscs, a guide for species identification. Planet Poster Editions, Göttingen. ISBN-10 3-933922-75-5 ISBN-13 978-3-933922-75-5.

Wiktor A. 2001, Fauna Graeciae VIII The slugs og Greece (Arionidae, Milacidae, Limacidae, Agriolimacidae – Gastropoda, Stylommatophora). Natural History Museum of Crete, Irakleio.

Zapparoli M. (1989) NOTES ON PLEUROLITHOBIUS OF TURKEY (CHILOPODA: LITHOBIOMORPHA) PROC. ENTOMOL. SOC. WASH. 91(3), 1989, pp. 389-397

Μανούσης Α. (2012) Τα κοχύλια της Ελλάδας. Αφοί Κυριακίδη Εκδόσεις Α.Ε. ISBN-13: 9789604673353

Τζωρτζακάκη Ο. (2012) Ποικιλότητα της εδαφοπανίδας του Μεγανησίου και των δορυφορικών νησίδων (Κεντρικό Ιόνιο Πέλαγος). ΜΕΤΑΠΤΥΧΙΑΚΟ ΔΙΠΛΩΜΑ ΕΙΔΙΚΕΥΣΗΣ ΣΤΗΝ ΟΙΚΟΛΟΓΙΑ – ΔΙΑΧΕΙΡΙΣΗ & ΠΡΟΣΤΑΣΙΑ ΦΥΣΙΚΟΥ ΠΕΡΙΒΑΛΛΟΝΤΟΣ.

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