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Short note

First Insights on the Herpetofauna of Ammouliani Island, Chalkidiki, Greece

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Abstract. Ammouliani is a small inhabited island of an area about 6.9 km^2, located in the Gulf of Agion Oros, Chalkidiki, Greece. Hitherto, there have been no herpetological surveys on the island and thus its herpetofaunal composition is still unknown. In the current short note, records of amphibians and reptiles from Ammouliani Island are presented for the first time. A two-day expedition in Spring 2022 resulted in one amphibian and nine reptile species records, all found to occur in relatively low densities. The small number of species of the island and the low densities are discussed.

Key words: Ammouliani, herpetofauna, reptiles, amphibians, fauna, Chalkidiki, Greece.

Introduction

Ammouliani Island is located in the northern part of the Gulf of Agion Oros, Chalkidiki, Greece (Fig. 1). The shortest distance between Ammouliani and the mainland is about 2.4 km (across from Tripiti Village). The island lies within an isobath shallower than 10 meters, within the continental shelf of Chalkidiki Peninsula. It has a total area of about 6.9 km^2, a highest elevation about 90 m.a.s.l. in its northern part and it hosts about 530 residents according to the 2011 census (Hellenic Statistical Authority, 2011). The prevalent type of vegetation of Ammouliani is maquis and phrygana, while agriculture is also noticeable, especially at the center of the island with many orchards, pastures and fields (Georgiev et al., 2018). A small brackish wetland is located in the center of the island and small seasonal streams are running through the island in several locations. On the southwestern margin of the main village there is also a small residual and degraded wetland that is drained through an artificial canal that empties in the village's port, being underground in most of its length. A few artificial ponds also occur scattered on the island. Ammouliani hosts a huge population of European herring gulls (*Larus argentatus*; Laridae) whose nests can be found almost everywhere in big numbers, even on the sides of the main asphalt roads.

To date, there are only a few publications on Ammouliani's fauna, focusing on Gastropoda (Georgiev et al., 2018) and Psocoptera (Insecta; Georgiev & Ivanova, 2019) and there are no published studies on the herpetofauna of the island, or other vertebrates in general. In this document, records of reptile and amphibian species from Ammouliani Island are presented for the first time.

Materials and Methods

A two-day herpetological survey on the island of Ammouliani was conducted between 14th and 16th May, 2022. Field work took place

during both day and night, using several methodologies as described in Heyer et al. (1994), Krebs (2014) and Wilkinson (2015), in order to inspect the presence and activity of all diurnal, crepuscular and nocturnal herpetofaunal species. The survey regarding amphibians was conducted with the use of the transect method and road cruising, mostly during the night. Scanning for amphibians' eyeshine using strong head torch was also performed, a technique that allows amphibian detection from a long distance and in a wide range.

As for reptiles, both transect and point count methods were used, as well as road cruising and inspection for dead on road animals. Species identification was performed with the use of both visual (morphological characters) and acoustic (Anuran breeding calls) techniques.

Results and Discussion

In total, one amphibian and nine reptile species were recorded during the short expedition on the island (presented in Table 1). Photographic vouchers were deposited in Natural History Museum of Crete (NHMC), while tissue samples from dead on road animals were obtained. The exact locations are herein withheld to protect these populations and a grid is used instead (Fig. 1) as a reference to the wider areas where the animals were found.

Species Account

Amphibians

Green Toad (GR: Πρασινόφρυνος), *Bufotes viridis* (Laurenti, 1768); Bufonidae. Many adult individuals were found active by night near and in water bodies, as well as a large number of tadpoles in freshwater reservoirs, canals and brooks. The Green Toad was also the only amphibian of which breeding calls could be heard near all water bodies of the island.

Reptiles

Hermann's Tortoise (GR: Μεσογειακή Χελώνα), *Testudo hermanni* Gmelin, 1789; Testudinidae. Only one dead juvenile specimen and a single adult individual were found in the west and in the center of the island, respectively. It seems that the species is quite rare with a sparse population and therefore it is likely endangered on the island.

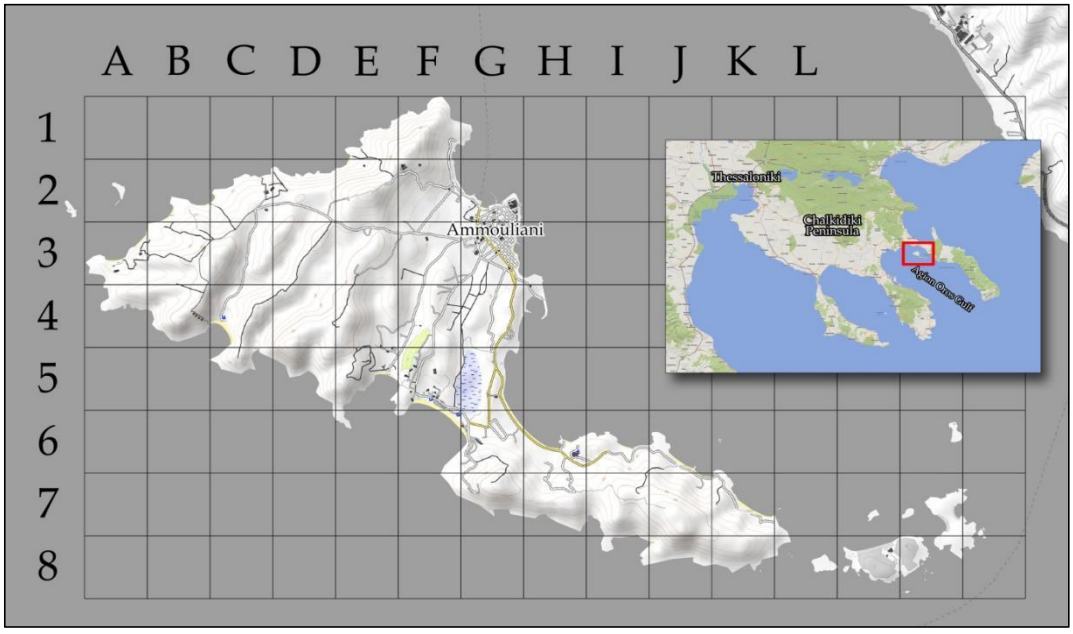

Fig. 1. Map of Ammouliani island, Chalkidiki, Greece. A grid of 500x500 m covers the map of the island to be used as a reference for the localities of the findings. The location of the island is shown within the red frame in the coloured map showing the Chalkidiki Peninsula. Both maps were generated using QGIS software, version 3.22.9 – "Białowieża".

Table 1. Full list of the amphibians and reptiles found on the island of Ammouliani in the two-day herpetological expedition. The number of individuals and the grid cells (in accordance with Figure 1) within which the species were observed, are also shown. The voucher numbers are assigned to photos that were taken during the survey and deposited in the Natural History Museum of Crete (Greece).

Family	Common name	Scientific name	Observed individuals	Grid cell	N.H.M.C. voucher number
Bufonidae	Green Toad	*Bufotes viridis*	>30 (adults)	C3, C4, E2, E3, F2, F3, G3	80.2.8.1130
Testudinidae	Hermann's Tortoise	*Testudo hermanni*	2	C4, F5	80.3.18.33
Geoemydidae	Balkan Terrapin	*Mauremys rivulata*	13	G2, G3	80.3.15.2003
Gekkonidae	Kotschy's Gecko	*Mediodactylus kotschyi*	11	F4, G2, G4, I6	80.3.85.2007
	Turkish Gecko	*Hemidactylus turcicus*	6	G2, G4	80.3.87.290
Lacertidae	Green Lizard	*Lacerta viridis*	5	F4, G3, G4	80.3.61.154 & 80.3.61.155
	Erhard's Wall Lizard	*Podarcis erhardii*	15	F2, F4, F5, G4	80.3.51.3061
Scincidae	Snake-eyed Skink	*Ablepharus kitaibelii*	1	C4	80.3.82.397
Colubridae	Large Whip Snake	*Dolichophis caspius*	1	E2	80.3.117.66
Viperidae	Nose-horned Viper	*Vipera ammodytes*	2	F3	80.3.40.56 & 80.3.40.57

Balkan Terrapin (GR: Γραμμωτή Νεροχελώνα), *Mauremys rivulata* (Valenciennes, 1833); Geoemydidae. The Balkan Terrapin was only recorded in an artificial canal near the main village (grid cell G3), but its presence in brooks and their estuaries is also very likely. Only a dozen of individuals could be seen in the canal and one dead on road specimen was found on the port's road.

Kotschy's Gecko (GR: Σαμιαμίδι/ Κυρτοδάχτυλος) *Mediodactylus kotschyi* (Steindachner, 1870); Gekkonidae. In total, 11 individuals were observed active both day and night at several spots, often sharing the same microhabitats with Turkish Geckos (see below). By day Kotschy's Geckos could be seen basking on rocks and ruins and their calls could be heard inside abandoned houses (grid cells F4, G2, G4 and I6).

Turkish Gecko (GR: Σαμιαμίδι/ Μολυντήρι), *Hemidactylus turcicus* (Linnaeus, 1758); Gekkonidae. *H. turcicus* was found foraging on walls and ruins inside the main village and in an abandoned house in the center of the island (grid cells G2 and G4), co-existing with Kotschy's Gecko.

Green Lizard (GR: Πρασινόσαυρα), *Lacerta viridis* (Laurenti, 1768); Lacertidae. Four Green Lizards were found in two spots in the center of the island (three adults and one juvenile; F4, G3 and G4) and one adult male right outside of the main village.

Erhard's Wall Lizard (GR: Αιγαιόσαυρα), *Podarcis erhardii* (Bedriaga, 1886); Lacertidae. The Erhard's Wall Lizard was observed basking and hunting on cut slopes of dirt roads, ruins and house fences (F2, F4, F5 and G4). 15 adult individuals were spotted in total during the two-day survey.

Snake-eyed Skink (GR: Αβλέφαρος), *Ablepharus kitaibelii* (Bibron & Bory de Saint-Vincent, 1833); Scincidae. Only one adult individual was spotted moving in low vegetation Near Karagatsia (grid cell C4) and it was captured, photographed and released shortly after. Snout to vent length was at 5 cm and the skink had small but visible ear openings.

Large Whip Snake (GR: Έφιος), *Dolichophis caspius* (Gmelin, 1789); Colubridae. A single adult individual was spotted crossing the road while road cruising in the north of the island (grid cell E2), showing the typical color phenotype as those from nearby mainland and central Makedonia in general. No photographs or other evidence of the species' occurrence could be obtained during the survey, except for

a photograph of a dead young specimen that was taken by an Ammouliani resident, Mr. Ilias Rodokalakis (pers. com.). The photograph was obtained and deposited in NHMC (Photographic voucher number 80.3.117.66). The dead snake of the photograph was also found in the north part of the island.

Nose-horned Viper (GR: Οχιά), *Vipera ammodytes* (Linnaeus, 1758); Viperidae. Two adult individuals were found, a dead on road male and a live female, both very close to the main village (F3) and to each other (photographic vouchers 80.3.40.56 and 80.3.40.57, respectively). The male specimen had a total length (TL) of 44.5 cm, 23 rows of dorsal scales across the middle of the body, 144 ventral scales and 34 pairs of subcaudal scales. The female (Fig. 2D) had a TL of 55.5 cm, 23 rows of dorsal scales across the middle of the body and 144 ventral scales. The very end of the tail tip was missing and the remaining subcaudal scales were arranged in 15 pairs.

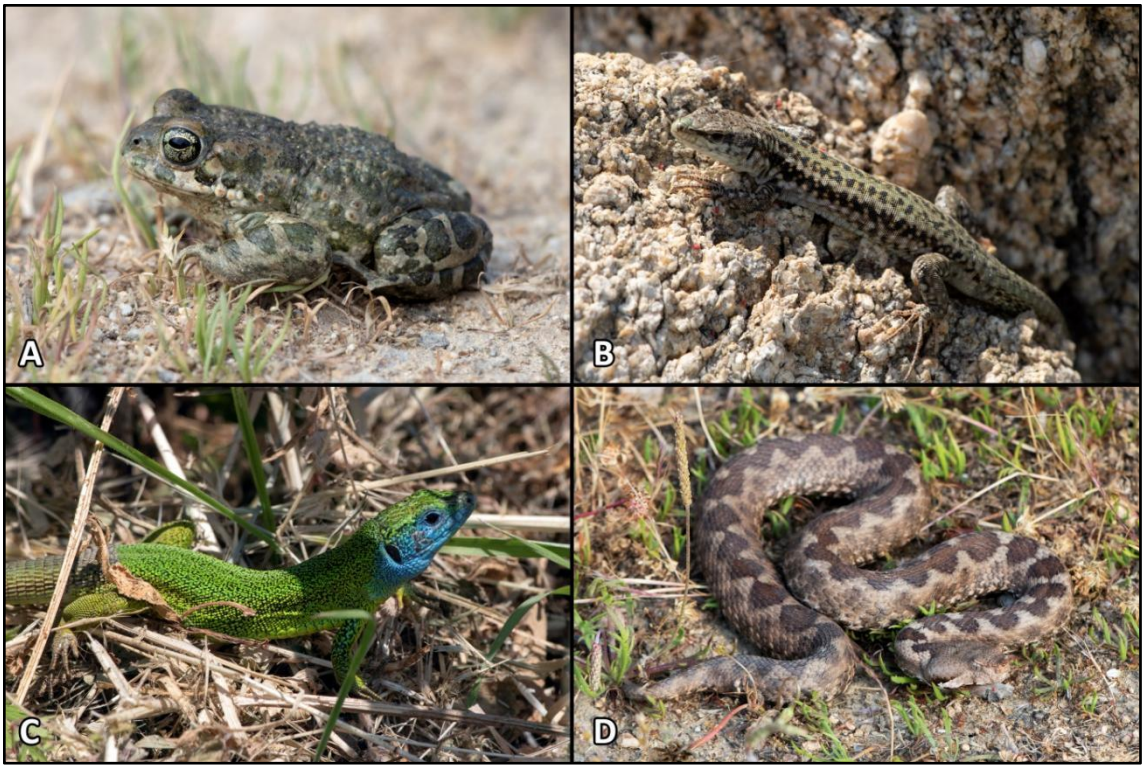

Fig. 2. Four out of the ten herpetofauna species that were found on the island of Ammouliani, indicatively. A) A male Green Toad, *Bufotes viridis*, B) a male Erhard's Wall Lizard, *Podarcis erhardii,* C) a male Green Lizard, *Lacerta viridis*, and D) a female Nose-horned Viper, *Vipera ammodytes*. Photos are deposited in the Natural History Museum of Crete (for voucher numbers see Table 1).

Other noteworthy animal records made on the island were that of the Northern white-breasted hedgehog, *Erinaceus roumanicus* (Erinaceidae) and scorpions of the genus *Euscorpius* (Euscorpiidae).

Judging by the habitats and the herpetofaunal composition of nearby areas, other amphibians that could possibly occur on the island are *Pelophylax* spp. (Ranidae), *Rana dalmatina* (Ranidae), *Hyla arborea* (Hylidae), *Bufo bufo* (Bufonidae), *Bombina variegata* (Bombinatoridae) and *Lissotriton graecus* (Salamandridae). However, no adults, juveniles, eggs or tadpoles/larvae from other amphibian species were recorded on the island. The fact that *Pelophylax* and *Hyla* frogs' breeding calls are very distinguishable and a lot louder than those of Green Toads, in conjunction with the season and the ideal weather conditions during which the survey took place, indicates that those species

are probably absent from Ammouliani island, as they were not seen, nor heard. On the other hand, the presence of the rest of the species cannot be excluded with confidence at the moment.

In general, densities of all species found on the island seem to be very low, despite that the habitats appear to be in good condition with only a few cases of degradation. One possible explanation to this could be the really high numbers of Herring gulls as the whole island constitutes a large and remarkably dense gull colony. European herring gulls (*L. argentatus*) are top opportunistic predators, not only of marine invertebrates and fishes, but also of birds, small mammals, amphibians and reptiles (Martín & López, 1990; Ewins et al., 1994; Prakas et al., 2020). The large number of Herring gulls, in opposition to the low density of amphibians and reptiles on the island, could indicate a high level of predation pressure on herpetofaunal species, however, further research is needed to verify this hypothesis.

This is the first time a herpetological survey is conducted on the island of Ammouliani, offering the first insights on its herpetofaunal composition, adding new insular populations to the currently known species distribution. These findings show once again that there are areas in Greece that are still underexplored (or even completely unexplored) regarding their herpetofauna (e.g. Kalaentzis et al., 2018; Strachinis et al., 2019; Strachinis, 2021), or other important taxa. The present study is preliminary; more thorough faunistic surveys on this underexplored island may reveal the presence of more species and their so far unknown conservation status.

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References

Ewins, P.J., Weseloh, D.V.J., Groom, H., Dobos, R.Z. & Mineau, P. (1994). The diet of Herring Gulls (*Larus argentatus*) during winter and early spring on the lower Great Lakes. *Hydrobiologia, 279/280*, 39-55.

Georgiev, D., Schneppat, U.E. & Dedov, I. (2018). A short study on the terrestrial Gastropoda fauna of Amouliani island (northern Aegean, Greece). *Parnassiana Archives, 6*, 15-20.

Georgiev, D. & Ivanova, V. (2019). On the Psocoptera fauna of Amouliani island (Chalkidiki, Greece). *Parnassiana Archives, 7*, 25-29.

Heyer, W.R., Donnelly, M.A., McDiarmid, R.W., Hayek, L.C. & Foster, M.S. (1994). *Measuring and monitoring biological diversity: standard methods for amphibians*. Smithsonian Institution Press, Washington and London.

Hellenic Statistical Authority (2011). *2011 Population-Housing Census*. Retrieved from statistics.gr.

Kalaentzis, K., Strachinis, I., Katsiyiannis, P., Oefinger, P. & Kazilas, C. (2018). New records and an updated list of the herpetofauna of Kastellorizo and the adjacent islet Psomi (Dodecanese, Greece). *Herpetology Notes, 11*, 1009-1019.

Krebs, C.J. (2014). *Ecological Methodology*. 3nd ed. (in prep), Menlo Park, California: Addison-Welsey Publishers.

Martín, J. & López, P. (1990). Amphibians and reptiles as prey of birds in southwestern Europe. Smithsonian Herpetological Information Service, 82, 1-43.

Prakas, P., Butkauskas, D. & Juozaitytė-Ngugu, E. (2020). Molecular identification of four Sarcocystis species in the herring gull, Larus argentatus, from Lithuania. *Parasites & Vectors, 13*, 2. doi: 10.1186/s13071-019-3869-x.

Strachinis, I., Karagianni, K.M., Stanchev, M. & Stanchev, N. (2019). No one ever noticed: First report of *Zootoca vivipara* (Lichtenstein, 1823) in Greece. *Herpetology Notes, 12*, 53-56.

Strachinis, I. (2021). First evidence on the occurrence of the Greek newt *Lissotriton graecus* and the Aesculapian snake *Zamenis longissimus* on Evia Island, Greece. *Parnassiana Archives, 9*, 115-117.

Wilkinson, J.W. (2015). *Amphibian Survey and Monitoring Handbook*. Exeter: Pelagic Publishing, U.K.

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