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Tzoras, E., Jablonski, D. (2026): Human-mediated dispersals in the Aegean region: the case of *Anatololacerta pelasgiana* on Chalki Island (Greece: Dodecanese). Acta Herpetol. **21.**
DOI: 10.36253/a_h-19819

Human-mediated dispersals in the Aegean region: the case of *Anatololacerta pelasgiana* on Chalki Island (Greece: Dodecanese)

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Submitted on: 2026, 08th February; revised on: 2026, 13th March; accepted on: 2026, 16th March.
Editor: Andrea Villa

Abstract. We report the first confirmed occurrence of *Anatololacerta pelasgiana* on Chalki Island (Dodecanese, Greece). The species was detected exclusively in and around the main settlement and port, within an area of ~0.9 km², suggesting an established population likely originating from a recent human-mediated introduction. To infer source affinity, we sequenced the mitochondrial cytochrome *b* gene from two individuals and compared these sequences with published ones from Aegean and adjacent Anatolian populations. Based on the analysed length of the cytochrome *b* fragment, the Chalki specimens share a widespread haplotype known from Rhodes, Kastellorizo, and Athens (Greece), as well as from southwestern Turkey. These results suggest repeated, transport-mediated introductions likely from nearby Rhodes as a recurrent driver of secondary colonization in the southeastern Aegean and underscore local trade links as pathways for small-island translocations, potentially relevant to other reptiles in the region.

Keywords. Lacertidae, Aegean Islands, lizard translocation.

Lizards of the genus *Anatololacerta* Arnold, Arribas and Carranza, 2007, are small lacertids present from western to southern Anatolia and many neighbouring islands. Currently, the genus comprises five species (Karakasi et al., 2021), i.e. *Anatololacerta anatolica* (Werner, 1900), *Anatololacerta danfordi* (Günther, 1876), *Anatololacerta ibrahimi* (Eiselt and Schmidtler, 1986), *Anatololacerta pelasgiana* (Mertens, 1959), and *Anatololacerta finikensis* (Eiselt and Schmidtler, 1986). Three representatives of the genus occur in Greece, which are found on Aegean islands: *A. anatolica* on Ikaria and Samos; *A. pelasgiana* on Rhodes, Symi and nearby islands; and *A. finikensis*, which is restricted to Psomi islet (Karakasi et al., 2021). *Anatololacerta pelasgiana* has the widest insular distribution among its sister species, occupying a broad range of different habitats (Şahin et al., 2022), and has already shown the potential to establish new introduced populations in other areas, as shown by the record from Athens in mainland Greece (Christopoulos et al., 2022).

During a series of field surveys to the Dodecanese archipelago, Greece, we visited the island of Chalki (36.230°N, 27.569°E) between 14 and 16 October 2025. Chalki is situated roughly 10 km from the island of Rhodes, which is part of the natural distribution of *A. pelasgiana*. The island hosts a notably poor herpetofaunal assemblage, comprising species that are widely distributed on nearby islands: *Hemidactylus turcicus* (Linnaeus, 1758), *Mediodactylus oertzeni* (Boettger, 1888), *Laudakia stellio* (Linnaeus, 1758), *Ablepharus kitaibelii* Bibron and Bory de Saint-Vincent, 1833, *Dolichophis jugularis* (Linnaeus, 1758), and *Zamenis situla* (Linnaeus, 1758) (Buttle, 1995; Grano and Cattaneo, 2015). However, *A. pelasgiana* has never been officially reported from the island despite its common presence in Rhodes and other islands and few previous herpetological investigations on the island (Buttle, 1995; Grano and Cattaneo, 2015).

Thus, we conducted random fieldwork along the main roads of the island. Due to its small size, surveys were conducted on foot. We visited both coastal and mountainous areas of the

island. Across our survey visits, we recorded 39 individuals of *A. pelasgiana* of all ontogenetic stages (Fig. 1A-C) inhabiting the main village Chalki and the surrounding biotopes, within an area of approximately 0.9 km² (Fig. 2). Therefore, this record represents an additional reptile species for Chalki Island and likely results from recent human-mediated introduction.

To assess their genetic affinity, we captured two individuals from the main village of Chalki and collected tail-tip tissue samples for genetic analysis. Both individuals were released at their respective capture sites. We amplified total genomic DNA (E.Z.N.A.® Tissue DNA Kit), targeting the mitochondrial cytochrome *b* (cyt *b*) gene following the protocol of Karakasi et al. (2021) and using the primer pair (LgluLK/Lacertidae_*cytb*) described by Pavlicev and Mayer (2009) and Khan et al. (2021). The newly generated sequences (693 bp) were compared with publicly available datasets in GenBank using BLAST to verify genetic/species similarity (100% identity with sequences GQ142137 and KM434522 from Rhodes). To visualize the intraspecific genetic network, we further aligned newly generated sequences with 45 published sequences of *A. pelasgiana* from Aegean Greece and related Turkey mainland (Bellati et al., 2015; Kalaentzis et al., 2018; Karakasi et al., 2021; Christopoulos et al., 2022; Appendix 1). The final sequence alignment (47 sequences, 420-998 bp) was analysed with a haplotype-network approach (alignment length 1143 bp) in Hapsolutely (Vences et al., 2024). To provide species distribution overview in the region, we compiled distribution data from Broggi (2006), Bader et al. (2009), Grano et al. (2015, 2018), and Karakasi et al. (2021), presented in Appendix 2. Distribution maps were prepared using QGIS 3.44 Solothurn (QGIS Development Team 2026; https://qgis.org/).

Based on the cyt *b* dataset, the Chalki population shares a haplotype present in populations from Rhodes and Kastellorizo (Greece), as well as Marmaris and Tavas (Turkey). Notably, the introduced Athens population also falls within this haplotype (Fig. 3).

In the Aegean region, *A. pelasgiana* is naturally distributed in the Dodecanese archipelago, where it inhabits the islands of Nisyros, Symi, Tilos, Rhodes, and Alimia, as well as the islets of Seskli, Pentanisos, and Strogyli (Bader et al., 2009; Cattaneo et al., 2020). In addition to its native range, the species has recently established populations on Kasos and Kastellorizo, two Dodecanese islands where it had not previously been recorded (Kornilios and Thanou, 2016; Kalaentzis et al., 2018). Furthermore, Christopoulos et al. (2022) reported the first colonization within the metropolitan area of Athens in mainland Greece. Interestingly, Grano et al. (2018) suggested that the population found on Tilos Island likely resulted from secondary human activities as the species is restricted to a few established sites. However, DNA-based comparison did not test it to confirm the assumption. These naturalized populations found on Kasos, Kastellorizo and Athens showed proximity to individuals from Rhodes, suggesting this particular island may have originated the introduced populations (Kornilios and Thanou, 2016; Kalaentzis et al., 2018; Christopoulos et al., 2022; and reference herein). We confirm that these populations share the same haplotype that colonized other areas.

Small Dodecanese islands in the vicinity of Rhodes are strongly connected through local trade and frequent transport, which likely facilitates the spread of *A. pelasgiana* among neighbouring islands. On Chalki, the relatively broad area in which we recorded *A. pelasgiana* suggests an already established population. Nevertheless, *A. pelasgiana* has not been reported from Chalki in the most recent herpetological surveys by other researchers (Buttle, 1995; Grano and Cattaneo, 2015, 2017), possibly indicating a rare case of early and recent colonization. If so, the presence of juveniles further supports the rapid establishment of the population after introduction.

Despite this, the population appears spatially restricted and has not expanded across the island beyond the vicinity of the settlements and port area. We detected *A. pelasgiana* only in suitable habitats near or within human-modified environments, primarily rocky shrublands

with scattered trees (Fig. 1D). Most individuals were observed in phrygana scrub associated with short, dry-stone walls and ground-level microhabitats (e.g. fallen logs, rocky shorelines). This pattern is consistent with our additional surveys farther east on the island, where *A. pelasgiana* was not detected, suggesting that these suitable areas may be colonized in the future.

Similar cases have also been documented in other native lacertids within the Aegean area and broader Greece. Among others, recent examples include the Peloponnese endemic *Podarcis peloponnesiacus* (Bibron and Bory de Saint-Vincent, 1833), which has established a population on the Attic Peninsula (Hedman et al., 2017), the widely distributed *Podarcis muralis* (Laurenti, 1768), now reported from Athens and Corfu Island in the Ionian Sea (Hill and Mayer, 2004; Karameta and Pafilis, 2017), the Balkan endemic *Algyroides nigropunctatus* (Duméril and Bibron, 1839), introduced to Athens, Crete, and the Peloponnese (Deimezis-Tsikoutas et al., 2020; De la Cruz et al., 2024; Prondzynska et al., 2025), as well as *Podarcis erhardii livadiacus* (Werner, 1902), introduced to a small Cycladic island (Adamopoulou et al., 2025).

Considering the Chalki herpetofaunal composition, coexistence with the endemic Dodecanese *M. oertzeni* and the Juniper Skink *A. kitaibelii*, may lead to interspecific competition, as the species may also exhibit potential predation toward smaller lizards (Bader et al., 2009). Nevertheless, this note documents an additional translocation event of *A. pelasgiana* within the Dodecanese archipelago, resulting from human-mediated activities that are historically and recently reported from the Aegean (e.g. Kornilios and Thanou, 2016; Kalaentzis et al., 2018).

Acknowledgments: Field activities and tissue sampling were performed under authorization from the Greek Ministry of Environment and Energy (ΥΠΕΝ/ΔΔΔ/96343/3547). We also

thank the two anonymous reviewers for their helpful comments and corrections, which improved the originally submitted version of the manuscript.

Authorizations: The research was supported by the EU NextGenerationEU scholarship through the Recovery and Resilience Plan for Slovakia under the project No. 09I03-03-V04-00306.

SUPPLEMENTARY MATERIAL

Supplementary material associated with this article can be found at:

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Fig. 1. Adult female (A) and young individuals (B, C) found basking at the main Chalki village. Phrygana shrublands encompasses dry stone walls as the habitat of the naturalised *Anatololacerta pelasgiana* in the island (D).

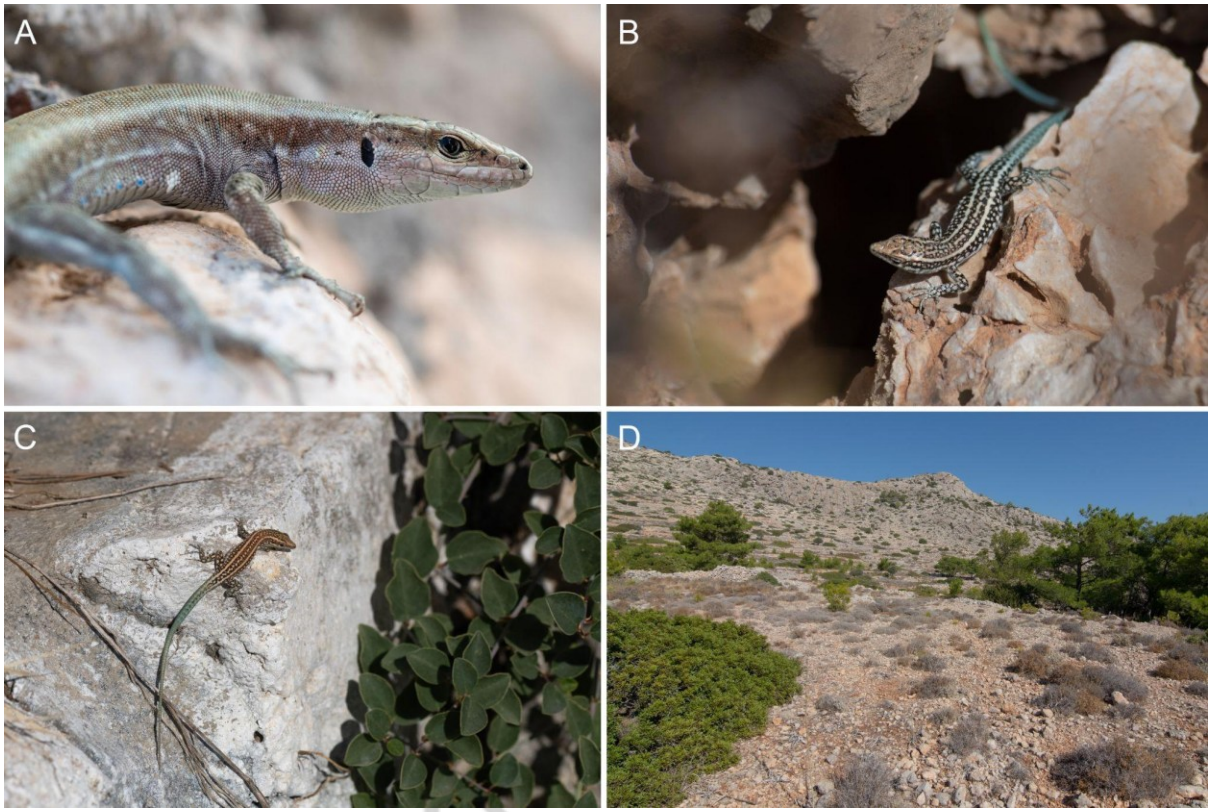

Fig. 2. The natural distribution of *Anatololacerta pelasgiana* in Greece (A) and details on herein reported records from Chalki Island (B).

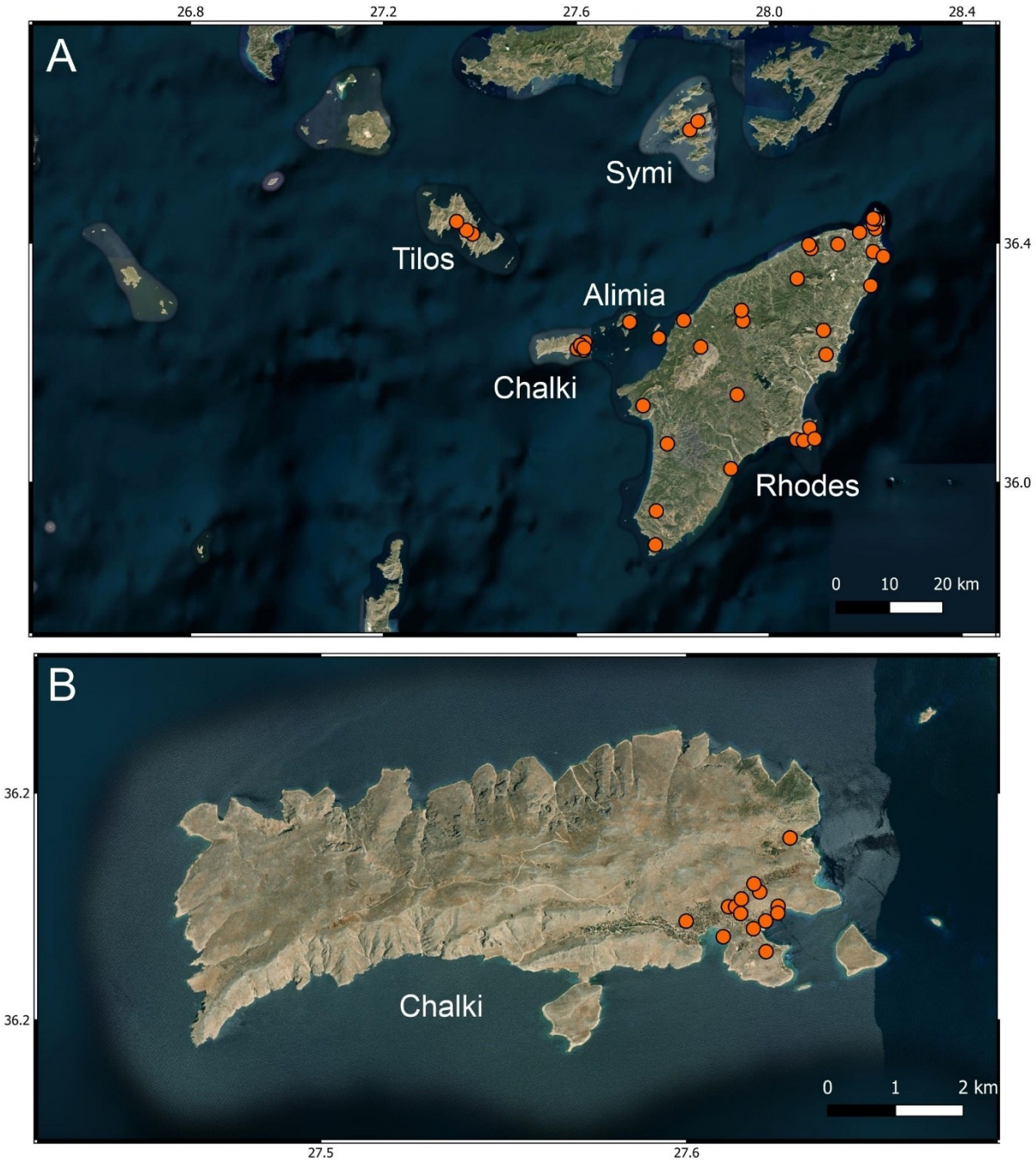

Fig. 3. Haplotype network of *Anatololacerta pelasgiana* (A) and geographic distribution of Chalki Island–affiliated haplotype (B). Numbers in panel A indicate GenBank accession numbers of sampled populations that are genetically concordant with the Chalki population.