



# New Distribution Data for the Endemic *Ichthyosaura alpestris veluchiensis* (Wolterstorff 1935) from the Peloponnese Peninsula, Greece

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The Alpine Newt, *Ichthyosaura alpestris* (Laurenti 1768) is a European newt species that inhabits most of western and central Europe, from the extreme north of Spain and Italy, as far as the Balkan Peninsula (Speybroeck et al. 2016). In Greece, the endemic subspecies *I. a. veluchiensis* (Wolterstorff 1935) is present, particularly in the southern Hellenides, Rhodopes, and northern Peloponnese, representing the southernmost part of the distribution range (Bringsøe 1994; Dufresnes 2019). The fragmented popula-

tions from the Peloponnese are considered Endangered and recent phylogeographic analyses indicate they form a separate, old lineage with evolutionary and conservation significance (Sotiropoulos et al. 2007, 2008, Sotiropoulos 2009; Recuero et al. 2014). Thus, I report here ten newly discovered populations of *I. a. veluchiensis* from the northwestern Peloponnese peninsula.

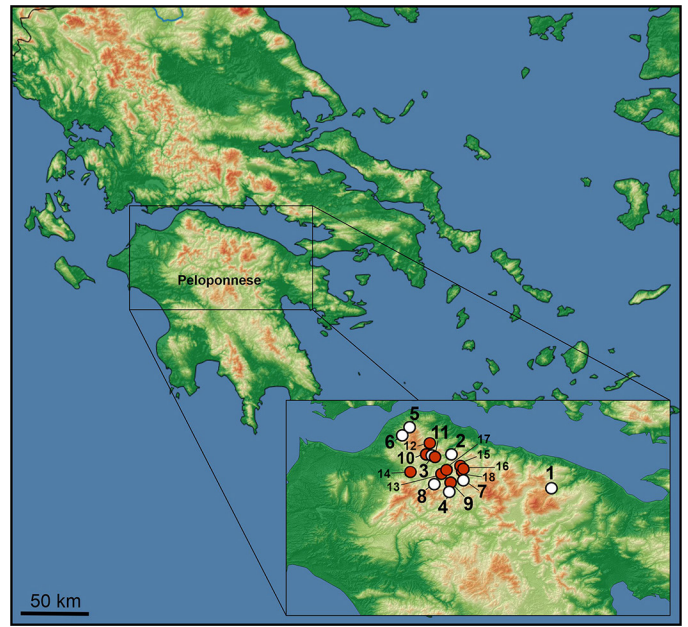
New localities presented here were discovered between 2018–2022, during random visual encounter surveys to



**Fig. 1.** Habitat of *Ichthyosaura alpestris veluchiensis* east of the village of Golemi, Mt. Panachaiko (A), the natural Vergouri pond at Mt. Panachaiko (B), and aquatic habitats at Lopesi Aegialias, Mt. Panachaiko (C), and near the village of Skepasto (D).

the north and northwestern parts of the peninsula, i.e., in the peripherally to already known range of the (sub)species. Depending on the altitude and availability of suitable water habitats, individuals of the (sub)species were found in the aquatic phase throughout the year (except January and August). Nine observations are related to man-made constructions (Fig. 1) such as artificial springs, cement cisterns, and concrete tanks, situated mostly close to shallow flowing canals in open grassy fields or in densely forested areas (*Abies cephalonica*, *Platanus orientalis*). In most of the cases, newts were also found to occur sympatrically with other amphibian species such as the Greek Stream Frog, *Rana graeca*; Balkan Water Frog, *Pelophylax (ridibundus) kurtmuelleri*; and aquatic larvae of the Fire Salamander, *Salamandra salamandra*. To certify these data in a museum collection, two voucher photographs of the first two larvae observations were deposited at the Natural History Museum of Crete (NHMC 80.2.3.48 and NHMC 80.2.3.49), and another five voucher photographs were deposited at the University of Kansas Digital Archive (KUDA; 13790, 13791, 13792, 13793, and 13794).

In recent decades, a few isolated populations have been mentioned in the literature, showing a limited distribution range across the prefectures of Corinthia and Achaia where the species occupies a variety of habitats between 700 and 1,600 m elevation (Breuil and Parent 1988; Adamakopoulos and Hatzirvasanis 1988; Bringsøe 1994; Mettouris et al. 2018; Tzoras and Vazquez 2019). Breuil and Parent (1988) were the first who reported the (sub)species on the Peloponnese peninsula, providing a single locality from Mt. Kyllini (1,600 m elevation), belonging to the prefecture of Corinthia. The prefecture of Achaia covers the area extending to the northwest of the peninsula, where *Ichthyosaura alpestris veluchiensis* was first recorded from two additional localities by Adamakopoulos and Hatzirvasanis (1988). Since then, subsequent observations have been made only from five localities and entirely correspond to that specific prefecture (i.e., Bringsøe 1994; Mettouris et al. 2018; Tzoras



**Fig. 2.** The distribution of *Ichthyosaura alpestris veluchiensis* in the northern Peloponnese Peninsula. Known (white dots) and newly discovered (red dots) localities are indicated by numbers: 1: Mt. Kyllini (Breuil and Parent 1988), 2: Mt. Klokos, 3: east of Veteika, Rakita Plateau (Adamakopoulos and Hatzirvasanis 1988), 4: east of Kertezi, 5: southeast of Ano Kastritsi, 6: east of Romanos (Bringsøe 1994), 7: near the town of Kalavryta (Mettouris et al. 2018), 8: southeast of Manesi (Tzoras and Vazquez 2019), 9: northeastern part of Kouteli, 10: east of Golemi, 11: Vergouri Pond, 12: south of Lopesi Aegialias, 13: Trechlo, 14: Aya Paraskevi, 15: between Plataniotisa and Skepasta, 16: Skepasta, 17: Neochori, 18: Avlonas (this report).

and Vazquez 2019). In addition to that, the present localities here also concern Achaia prefecture, as they were all made on occasional excursions to this area (Fig. 2). However, the population of Rakita, Mt. Panachaiko is considered extinct as stated in the Red Book of Threatened Animals of Greece (Sotiropoulos 2009). According to the original article of Adamakopoulos and Hatzirvasanis (1988), the species had been found inhabiting semi-natural wells, situated in a natural marsh on the Rakita plateau.



**Fig. 3.** A terrestrial-phase *Ichthyosaura alpestris veluchiensis* found near a semi-natural well on the Rakita Plateau, Mt. Panachaiko.

During a brief survey of the area (5 November 2017), I was able to confirm the occurrence of three individuals, one in terrestrial form and two in aquatic (Fig. 3). The natural marsh in this locality is connected to a shallow flowing seasonal canal that reaches directly to the water cistern inhabited by the second population (location 10 – East of Golemi; see table) presented here, having a distance ca. 900 m from the semi-natural well. Hypothetically, the small new population east of Golemi might be related to the extinct population of Rakita, which might represent evidence of a spring migration and colonization of nearby permanent aquatic sites, or even migration due to possible drying events over the years. Such lengthy migration distances are known to occur, and in a season can exceed 500 m (Kovář et al. 2009). Most of the water bodies where newts were spotted are man-made constructions, such as cement cisterns and tanks, while only a single observation was made at a natural habitat (location 11 – Vergouri Pond). Such types of man-made aquatic refuges and opportunistic breeding sites could not be maintained for a long time, since they are on private property and their use could be changed or modified. The fact that observations were made in natural habitats compared to artificial ones, warrants further investigation for the NW Peloponnese, and urgent conservation actions (i.e., restoration and construction of breeding sites) are required for habitat and popula-

tion stability. Moreover, in such artificial constructions of limited size, *P. kurtmuelleri* might constitute potential pressure on newt individuals. Marsh Frogs are opportunistic feeders and it is well known that they occasionally prey on other amphibians (Katsiyiannis and Tzoras 2020 and references therein). The newly discovered populations expand the local distribution of *I. a. veluchiensis* in the Peloponnese Peninsula, particularly the prefecture of Achaia. Also, the extinct population of Rakita seems that it might be related to the newly discovered population of the eastern Golemi and the occurrence in the area is reaffirmed. Nevertheless, further research is needed to investigate suitable sites in the wider area of Achaia's mountain zone, as well as in the highlands of Corinthia where even nowadays the Greek Alpine Newt has only been observed in a single locality (Breuil and Parent 1988).

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**Table 1.** Known (1–8) and newly discovered populations (9–18) of *Ichthyosaura alpestris veluchiensis* on the Peloponnese Peninsula, Greece. Numbered locations correspond to those in Fig. 2.

Number	Locality name	Elevation (m)	Latitude (°N)	Longitude (°E)	Source
1	Mt. Kyllini	1600	37.9974	22.4691	Breuil and Parent 1988
2	Mt. Klokos	1300	38.1444	22.0329	Adamakopoulos and Hatzirvasanis 1988
3	East of Veteika, Rakita Plateau	1150	38.1391	21.9470	Adamakopoulos and Hatzirvasanis 1988
4	East of Kertezi	745	37.9819	22.0264	Bringsøe 1994
5	Southeast of Ano Kastritsi	1050	38.2625	21.8522	Bringsøe 1994
6	East of Romanos	860	38.2286	21.8205	Bringsøe 1994
7	Near the town of Kalavryta	800	38.0320	22.0852	Mettouris et al. 2018
8	Southeast of Manesi	710	38.0178	21.9599	Tzoras and Vazquez 2019
9	Northeastern part of Kouteli	805	38.0208	22.0306	Current work
10	East of Golemi	1070	38.1439	21.9258	Current work
11	Vergouri pond	1020	38.1342	21.9633	Current work
12	Lopesi Aegialias	1100	38.1615	21.9472	Current work
13	Trechlo	659	38.0380	21.9895	Current work
14	Ayia Paraskevi	1006	38.1285	21.8343	Current work
15	Between Plataniotisa and Skepastro	1180	38.0743	22.0745	Current work
16	Skepastro	998	38.0601	22.0689	Current work
17	Neochori	697	38.0490	21.9884	Current work
18	Avlonas	990	38.0529	22.1132	Current work

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