

## First records of the Italian wall lizard, *Podarcis siculus* (Rafinesque-Schmaltz, 1810) (Squamata: Lacertidae) in Albania

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**Abstract:** The occurrence of the Italian wall lizard (*Podarcis siculus*) in Albania is confirmed. Our findings are now the southernmost known records of the species on the eastern Adriatic coast, and officially present a new reptile species for the Albanian herpetofauna. The origin of these records is discussed; molecular investigation is needed for future evaluation of *P. siculus* populations in Albania and the western Balkans.

**Key words:** New records, introduction, Balkan Peninsula, *Podarcis siculus*, faunistics

Albania has a rich herpetofauna with 53 species, including 16 amphibians and 37 reptiles (Bruno, 1989; Haxhiu, 1994, 1998; Jablonski, 2011). However, a recently published list comparing chorotype assignments of amphibians and reptiles in the Balkans (see Appendix in Jablonski et al., 2012) presents 16 species of amphibians (including 2 species complexes) and 36 species of reptiles (also including 2 species complexes) for Albania. This discrepancy has been caused by taxonomical changes based on recent molecular research. Therefore, the final number of amphibian and reptile species in Albania will probably change.

Despite high species diversity in Albania, distribution of amphibians and reptiles is poorly known (Sillero et al., 2014), and intensive research and mapping are lacking. There are several species of herpetofauna whose overall ranges of distribution extend to Albania only marginally [*Pelobates syriacus* (Boettger, 1889); *Salamandra atra* Laurenti, 1768; *Testudo graeca* Linnaeus, 1758; *Dalmatolacerta oxycephala* (Duméril and Bibron, 1839); *Dinarolacerta montenegrina* Ljubisavljević, Arribas, Džukić and Carranza, 2007; *Eryx jaculus* (Linnaeus, 1758)], or which were recorded only casually [*Tarentola*

*mauritanica* (Linnaeus, 1758)]. This could be a reason for our insufficient knowledge about their distribution as well as the result of past accidental introduction (Haxhiu, 1994, 1998).

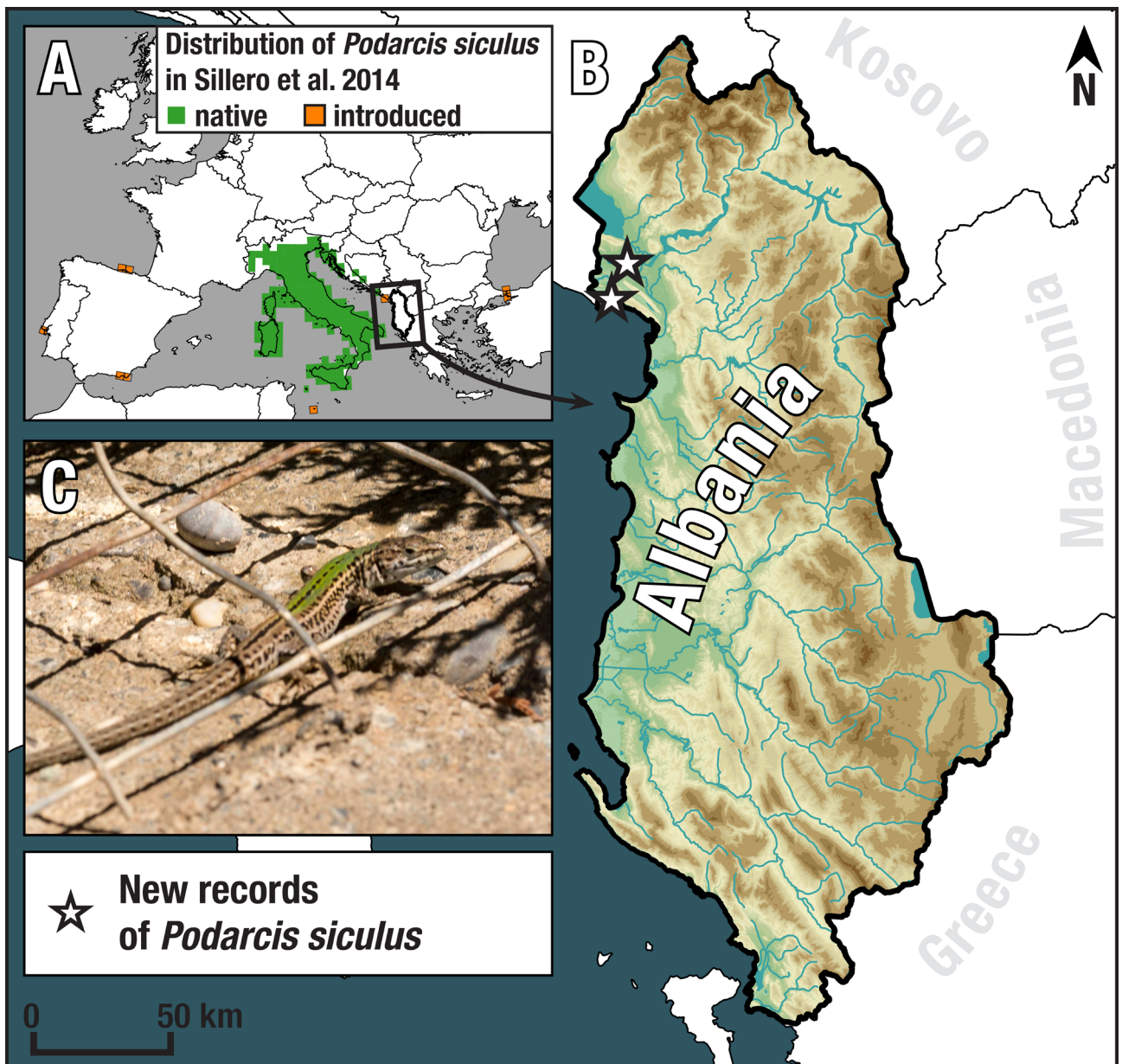
The Italian wall lizard, *Podarcis siculus* (Rafinesque-Schmaltz, 1810), is a European species from the family Lacertidae that has been introduced into different parts of the world. Its native range primarily includes the Italian Peninsula, the islands of Sicily and Sardinia and many others in the Tyrrhenian Sea, the northwestern Balkans (Adriatic coast from Slovenia to Montenegro), extreme southern Switzerland, and southern France (Figure 1A; Sillero et al., 2014). However, this species has a very high rate of successful establishment when it is introduced (Silva-Rocha et al., 2014). Isolated or introduced populations have been recorded in Corsica, the Iberian Peninsula, Menorca, Lampedusa, northwestern Turkey, the United Kingdom, the United States, and probably Libya and Tunisia (Mollov, 2009; Rivera et al., 2011; Ilgaz et al., 2013; Kolbe et al., 2013; Silva-Rocha et al., 2014; Tok et al., 2015). Moreover, molecular analyses showed that some of the populations on the eastern Adriatic coast were introduced from close ones in the Apennine Peninsula

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(Podnar et al., 2005) and mixed with native populations. Most recently, this species has been recorded from Greece (Athens; Adamopoulou, 2015). Therefore, the situation in the Balkans is very complicated, with the existence of native as well as introduced populations.

We recorded *Podarcis siculus* in Albania (Figure 1B) for the first time on 13 April 1995, at 1000, near Velipojë village (fewer than 10 specimens; 41.86404°N, 19.40600°E; 6 m a.s.l.; Shkodër, Albania). The habitat is a mosaic of halophile marshland characterized by *Juncus acutus* and *Pinus halepensis* and variously sized sand dunes. Twenty

years later and 2 km away, we observed this species again on the street in Velipojë on 26 May 2015, at 1240 (1 specimen; 41.86282°N, 19.43187°E; 1 m a.s.l.; Shkodër, Albania). The specimen was spotted in a highly urbanized environment (Figure 1C), on a concrete stone wall of a garden planted with *Cupressus sempervirens*. A third observation was made 15 km away from Velipojë, in the cemetery of Trush village on 26 May 2015, at 1800 (12 specimens; 41.97959°N, 19.48410°E; 6 m a.s.l.; Shkodër, Albania). The lizards were moving on the tombstones, surrounded by grazed grassland with a few deciduous oaks.



**Figure 1.** A: Overview of the distribution of *Podarcis siculus* in Europe with the delimitation of the inset (B); B: New records of *P. siculus* (white stars) with topography and main water bodies in background; C: Italian wall lizard from Velipojë (photo by E. Mizsei).

The herein-described Albanian records are now the southernmost known places with occurrence of the species on the eastern Adriatic coast, and officially represent a new reptile species for the Albanian herpetofauna. Previously, the southernmost area boundary for *P. siculus* was between Kotor (Podnar et al., 2005) and Donji Štoj (Jovanović, 2009) in Montenegro. However, the latter record is doubtful, based only on a damaged specimen on which taxonomic determination could not fully be performed (Jovanović, 2009). Confusion with *Podarcis melisellensis* (Braun, 1877), a similar and common species in Donji Štoj, is therefore not excluded. In any event, there are two ways to explain the origin of *P. siculus* populations in Albania: (i) by natural dispersion from the nearest native populations of this species on the mainland of the Balkans (cf. Jovanović, 2009; Sillero et al., 2014) or, more likely, (ii) as the result of accidental introduction from populations occurring throughout coastal Montenegro or eastern Italy (cf. Podnar et al., 2005). These authors have suggested an ancient introduction of the species to the Adriatic coast by maritime traffic. The introduced populations closest to the Albanian localities are in Dubrovnik, Croatia (~140 km) and Kotor, Montenegro (~80 km), which share the same cytochrome *b* haplotypes (mtDNA) as the southern Italian populations (Podnar et al., 2005). At present, the subspecific status of the Albanian populations is unclear due to two possible independent origins: *P. s. siculus* (Rafinesque-Schmaltz, 1810) is probably from Dubrovnik or of *P. s. campestris* De Betta, 1857 from the Adriatic coast. However, the dorsal pattern of the observed specimens is similar to that of *P. s. campestris* (Figure 1C). Considering the very dense maritime traffic between the Italian city of

Bari and the Montenegrin Bar or the Albanian Durrës, we assume that these Albanian populations are the result of accidental introduction of *P. siculus* in the coastal village Velipojë, and subsequent dispersion of the species to the inland locality (Trush village). This is supported by the large distribution gap between the Albanian and Montenegrin or Croatian populations (cf. Sillero et al., 2014), as well as by the fact that the detailed herpetological investigations on the southern Montenegrin coast have not confirmed the presence of *P. siculus* there (Polović and Čadenović, 2014).

However, the overall situation is probably more complicated (especially in Montenegro) due to the existence of native as well as introduced populations in one area (Podnar et al., 2005). Therefore, distribution of the potentially introduced mtDNA haplotypes of the Italian wall lizard in the western Balkans should be examined carefully, and the question of the origin of *P. siculus* in Albania is open. For this reason, future collection of available published records and extensive field studies in concordance with molecular research are necessary for chorological assessment of *P. siculus* in the western Balkans.

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#### References

- Adamopoulou C (2015). First record of *Podarcis siculus* (Rafinesque-Schmaltz, 1810) from Greece. *Herpetozoa* 27: 187-188.
- Bruno S (1989). Introduction to a study of the herpetofauna of Albania. *British Herpetol Soc Bull* 29: 16-41.
- Haxhiu I (1994). The herpetofauna of Albania. *Amphibia: species composition, distribution, habitats. Zool Jahrb Abt Syst Geog Biol Tiere* 17: 199-202.
- Haxhiu I (1998). The reptilia of Albania: species composition, distribution, habitats. *Bonner Zool Beitr* 48: 35-57.
- Ilgaz Ç, Kumlutaş Y, Sözen M (2013). New locality record for *Podarcis siculus hieroglyphicus* (Berthold, 1842) (Squamata: Lacertidae) in the western Black Sea region of Anatolia. *Turk J Zool* 37: 123-127.
- Jablonski D (2011). Reptiles and amphibians of Albania with new records and notes on occurrence and distribution. *Acta Soc Zool Bohem* 75: 223-238.
- Jablonski D, Jandzik D, Gvoždík V (2012). New records and zoogeographic classification of amphibians and reptiles from Bosnia and Herzegovina. *North-West J Zool* 8: 324-337.
- Jovanović M (2009). Amphibia and reptilia of Štoj Plain (Ulcinj, Montenegro). *Bull Nat Hist Mus* 2: 137-152.
- Kolbe JJ, Lavin BR, Burke RL, Rugiero L, Capula M, Luiselli L (2013). The desire for variety: Italian wall lizard (*Podarcis siculus*) populations introduced to the United States via the pet trade are derived from multiple native-range sources. *Biol Invasions* 15: 775-783.
- Mollov I (2009). A new locality of the Italian wall lizard *Podarcis siculus* (Rafinesque-Schmaltz, 1810) from Turkey. *ZooNotes* 6: 1-3.
- Podnar M, Mayer W, Tvrtković N (2005). Phylogeography of the Italian wall lizard, *Podarcis sicula*, as revealed by mitochondrial DNA sequences. *Mol Ecol* 14: 575-588.

- Polović L, Čadenović N (2014). The herpetofauna of the Great Ulcinj Beach area including Ada Island (Montenegro). *Turk J Zool* 38: 104-107.
- Rivera X, Arribas O, Carranza S, Maluquer-Margalef J (2011). An introduction of *Podarcis sicula* in Catalonia (NE Iberian Peninsula) on imported olive trees. *Bull Soc Cat Herp* 19: 83-88.
- Sillero N, Campos J, Bonardi A, Corti C, Creemers R, Crochet PA, Crnobrnja-Isailović J, Denoël M, Ficetola GF, Gonçalves J et al. (2014). Updated distribution and biogeography of amphibians and reptiles of Europe. *Amphibia-Reptilia* 35: 1-31.
- Silva-Rocha I, Salvi D, Harris DJ, Freitas S, Davis C, Foster J, Deichsel G, Adamopoulou C, Carretero MA (2014). Molecular assessment of *Podarcis sicula* populations in Britain, Greece, and Turkey reinforces a multiple-origin invasion pattern in this species. *Acta Herpetol* 9: 253-258.
- Tok CV, Çiçek K, Hayretdağ S, Tayhan Y, Yakin BY (2015). Range extension and morphology of the Italian wall lizard, *Podarcis siculus* (Rafinesque-Schmaltz, 1810) (Squamata: Lacertidae), from Turkey. *Turk J Zool* 39: 103-109.